



Unveiling Excellence

SYLLABUS

MA/M.Sc. Geography

Learning Outcomes Based Curriculum Framework (LOCF)

Effective from Academic Session 2021-22

*Approved in the 13th meeting of the Academic Council of the University held
on September 25, 2021*



DEPARTMENT OF EARTH SCIENCE
UNIVERSITY OF SCIENCE & TECHNOLOGY MEGHALAYA
(Accredited 'A' Grade by NAAC)

PREAMBLE

The UGC Committee constituted for Learning Outcomes based Curriculum Framework for Geography M.A./M.Sc. programme is pleased to submit its report.

The Committee suggests that the following remarks may be taken into account by those faculty and research members of Departments/Schools, Boards of Studies in Geography, Institutes and Universities, while considering the recommendations for their use:

- i. The learning outcomes are designed to help learners understand the objectives of studying M.A./M.Sc. in Geography, that is, to analyze, appreciate, understand and critically engage with tangible, non-tangible, literary and material sources, approaching them from various perspectives.
- ii. It is significant to mention here that the M.A./M.Sc. in Geography syllabus under CBCS remains the point of reference for the LOCF recommendations. However, stakeholders (respective departments or Universities or Institutions) may make suitable alternations with justifications while selecting course, finalizing objectives keeping in view global, national and regional contexts of analysis and appreciation.
- iii. To this end, the texts mentioned in the LOCF document are indicative. Similarly, the organization of divisions/ themes/ genres/ periods/ authors/ areas, etc. is specific to contexts identified in the course(s) and does not pre-empt further rethinking or selection with clear justification for the choices exercised therein.
- iv. The organization of the courses/papers may be worked into semesters keeping in consideration the credit load with the ultimate end of outcomes of the course/programme. Learning outcomes are modifiable with due justification in view of contexts, texts selected in the course and requirements of the stakeholders, which are as diverse as are regions in the country.
- v. The overarching concern of the LOCF committee in Geography is to have definite and justifiable course outcomes and their realization by the end of the course/programme.
- vi. The Department/Institute/University is expected to encourage its faculty concerned to make suitable pedagogical innovations, in addition to teaching/learning processes suggested in the LOCF Recommendations, so that the Course/Programme learning outcomes can be achieved.

PART I

1.1 INTRODUCTION:

Outcome based learning is the principal end of pedagogical transactions in higher education in today's world in the light of exponential changes brought about in science and technology, and the prevalent utilitarian world view of the society. Geography as a discipline falls within social as well as applied sciences with an interdisciplinary approach.

Geography is both an art and science that deals with human activity and interaction with the surrounding over the space and time. Because of advances in methods and theory, Geography now addresses issues central to debates in social and applied sciences in a far more sophisticated manner than ever before. Coupled with methodological innovations, Geographical studies around the world have produced a storehouse of data that provide a unique perspective on long-term changes in human societies and the environment spatio-temporally. New avenues for research emerged in the subject with the progress of time. Geography is having tremendous inputs in the applied field as well through cartography, GIS & Remote sensing.

The LOCF for Geography is prepared on the contours and curricular structure provided by the UGC, and may be modified without sacrificing the spirit of CBCS and LOCF.

1.2 LEARNING OUTCOMES-BASED APPROACH TO CURRICULAR PLANNING

The main goal to develop this curriculum is for students to develop skills in the following learning elements--problem, approach, theory/model, analysis, and application. Students will develop the ethical aptitudes and dispositions necessary to acquire and hold leadership positions in industry, government and professional organizations. Students will be able to synthesize geographic knowledge and apply innovative research strategies to solve problems in resource conservation, environmental change and sustainable development within the community, region and world.

Problem - problems are identified through on-field observation, reading texts, reviewing articles, writing synopses, freewriting, developing abstracts, journaling, observing behaviors, reviewing books and evaluating other research.

Approach – Both qualitative or quantitative approaches can be applied in problem-solving in Geography. Various data may be collected from field study or Remote sensing to a problem or from secondary sources.

Theory/model - set the problem within a theoretical framework or prepare a model based on the facts and try to provide a solution to the social and environmental issues.

Analysis – Analyse adopting a qualitative or quantitative suitable approach as per the problem. Mapping is basic for analysis.

Application - relate research findings and analysis to real problems through fieldwork, internships, projects, and advocacy by developing collaboration with stake holders.

1.2.1 Nature and extent of MA/ MSc programme

Students enrolling for the programme will be provided with a broad knowledge of local, regional, national and global geography and research methods. Students will build their research and writing skills in their Post-Graduate courses, culminating in the preparation of a significant piece of scholarly writing, which will constitute their M.A./M.Sc. dissertations. The M.A./M.Sc. in Geography is based upon a combination of teaching, coursework and research leading to the development of thesis. Interdisciplinary contacts will be encouraged, and links should be maintained with other departments in the country as well as international Institutes. The nature of the curriculum will be as such that students can learn as well as demonstrate through quizzes, exams, group discussions, seminars, class discussions, collaborative projects, journals, annotated bibliographies, thesis and dissertation writing and applied projects.

1.2.2 Aims of Masters Degree Programme

- To have a broad knowledge of theory and research across Geography and the sub-disciplines of the same.
- To get an overview of geographical sources in a way that reveals a comprehensive understanding and a critical perspective.
- To be able to present critical analyses of research in public forums.
- To demonstrate the ability to collect and analyze geographical data.

- To successfully master appropriate geographical research methods, including statistical analysis.
- To collect, analyze, and interpret geographical data in a way that adds to the understanding of social, cultural and environmental interrelationships in proper context.
- To develop ability to critically question seemingly universal models of thought, value orientations, and practices.

1.3 Post- Graduate Attributes

- a. Disciplinary Knowledge: broad understanding of geographical development of human – environment approached through the material remains of the past.
- b. Understanding relation between human and environment that has impacted development of human culture in different ecological zones
- c. Gain an understanding of the major theoretical perspectives and debates within geography, how these have affected our views of the past, and how they may be applied to research in this field.
- d. Develop a professional ethos in geography that is engaged and integrative and that will enhance the operationalization of responsible scientific research.
- e. Identify and distinguish the steps involved in carrying out quantitative and qualitative research by using available library and internet resources, as well as primary materials, including literary, historical and field sources.
- f. Understand and appreciate the legacy of geography on modern cultures.

Communication Skills:

- a) Effectively communicate arguments, analyses and research results orally.
- b) Produce and express coherent, persuasive and innovative written studies (using relevant tangible and intangible data) with attention to academic integrity and respect for diverse, including contrary opinions and ideas.

Critical Thinking:

- a) Acquire an understanding of the concept of stewardship in geography: preserving non-renewable resources through policy, planning, law and public education.
- b) Acquire, digest and critically evaluate scholarly arguments, the assumptions behind them, and their theoretical and empirical components.

Problem Solving:

- a) An ability to generate fresh insights into a subject.
- b) Exceptional practical problem-solving skills.

Analytical Reasoning:

- a) Understanding context behind the analysis of the past world through processes, systems and models
- b) Developing objectivity and subjectivity in problem analysis.

Research-Related Skills:

- a) Develop a research design, which has an appropriately humanistic goal but may incorporate some scientific methods, ability to plan and write a research paper

Self and Time Management:

Self-management, the most important skill to learn through time bound research.

Team Work:

- a) To cooperate, using their individual skills and providing constructive feedback, despite any personal conflict between individuals.
- b) Crucial part of a research, as it is often necessary for colleagues to work well together, trying their best in any circumstance.

Scientific Reasoning:

Developing and testing hypotheses to describe and explain behavioral changes in the problems applying scientific methods.

Digital Literacy:

- a) Ability of work in Word skills and Geo-informatics, statistics, databases, spreadsheets, digital drawing through online workbooks and workshops
- b) Ability to use digital resources for presentations

Multicultural Competence:

- a) Ability to engage with and understand Geography and culture from various parts of the World.
- b) Gaining experience through research in field study, archive, laboratory, conservation, etc.

Moral and Ethical Values:

The degree to which every student engages with these themes will vary but it is important that all think especially about ethical issues

Leadership Readiness:

- a. ability to lead socio-cultural and socio-environmental education
- b. high quality professional development to teach socio-cultural values and environmental understanding.

Life-long Learning:

- a) ability to blend academic and practical skills
- b) ability to transfer such skills to other domains of one's life and work

Global Competency

After completing course in Geography, the student is expected to be fully knowledgeable about the subject and not only from the point of view of examination. He/She will be ready to accept challenges and stand in competition at a national and global level.

1.4 Qualification descriptors for a Master's degree in Geography

The qualification descriptors for the M.A./M.Sc. programme in Geography shall have the learning attributes such as field knowledge, use of advance tools and techniques for better

comprehension of space and society, research etc. It also involves awareness among the students regarding the issues of different regions and socio-cultural as well as socio-environmental aspects. The main qualification descriptors for the M.A./M.Sc. Geography students are to develop the critical evaluation and understanding about man-environment relationship and issues. Each student in Geography should be able to;

- Demonstrate systematically geographical knowledge and understanding the theoretical as well as practical applications with understanding of various aspects.
- Demonstrate the ability to understand the significance of geographical aspects in relation to development of the regions and minimizing regional inequalities.
- Demonstrate the ability and geographical thinking critically regarding rural and urban spaces and their day to day problems with the application of geographical knowledge.
- Students have to demonstrate their geographical knowledge acquired in the class and apply the same in real world.
- Recognise the scope of geography in terms of exploring the career opportunities, employment and life-long engagement in teaching and utilise the knowledge for publication for the future academic endeavors.

The students have to develop the ability through the theoretical and practical means for realising the Sustainable Development Goals (SDG) both in rural and urban spaces to minimize the differentials in developmental aspects.

1.5 Programme Learning Outcomes (M.A./M.Sc. Geography)

The programme learning outcomes are as follows:

1. Demonstrating the understanding of basic concepts in geography.
2. Students will acquire an understanding of and appreciation for the relationship between geography and culture.
3. Students will have a general understanding of physical geographic processes, the global distribution of landforms and ecosystems and the role of the physical environment on human populations.
4. Students will be able to think in spatial terms to explain what has occurred in the past as well as geographic principles to understand the present and plan for future.
5. Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local level on various time scales as well.
6. Recognize the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration.

1.6 THE TEACHING LEARNING PROCESS:

Learning Outcomes based Curriculum Framework (LOCF) for geography incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, food security, water security, energy security, biodiversity, disaster management, human health and wellbeing and livelihood security. The approaches are to make geography more scientific and societal-need oriented that could be the panacea of India's development. Geography uses scientific knowledge with the present focus that includes spatio-temporal analysis, skill development, Geo-informatics, sustainable development and

human security.

Learning is a challenging, engaging, and enjoyable activity. Learners should be encouraged to engage in a rigorous process of learning and self-discovery by adopting a highly focused and yet flexible approach to education. Each day learners should be encouraged to focus on key areas of the course and spend time on learning the course fundamentals and their application in life and society.

In teaching and learning pedagogy, there should be a shift from domain or conclusions based approach to the experiential or process based approach.

Geography curriculum inculcates knowledge of essential concepts of physical and human geography together with appropriate techniques using lectures, tutorials, group discussion, presentation, assignment evaluation, lab work and field visits. Thus, pedagogy process includes:

- Identifying and explaining the physical and cultural characteristics globally and processes at varied spatio-temporal contexts.
- Understanding human-environment and nature-society interactions as well as various global environmental challenges.
- Analysing geographic information by using geo-spatial technologies.
- Responding towards the global and national initiatives.

Broad framework for teaching in the class includes:

1. Theory courses should have 4 hours per week for courses carrying 4 credits.
2. Tutorial group of each theory course should have a group size of 30 students.
3. Practical courses should have 8 hours per week for a group of 30 students.
4. Practical courses will not have tutorials.

The faculty should promote learning on a proportionate scale of 20:30:50 principle, where lectures (listening/hearing) constitute 20 per cent of the delivery; visuals (seeing) 30 per cent of the learning methods; and experience (doing/participating) 50 per cent. This ratio is subject to change as per institutional needs.

In order to achieve its objective of focused process based learning and holistic development, the Institution/University may use a variety of **knowledge delivery methods**:

1. Lectures

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get new insights in the subject area, on which they can build their own bridges to higher learning.

2. Discussions

Discussions are critical components of learning, and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real life issues and discussion groups lead to innovative problem solving and, ultimately to success.

3. Life Skills:

Life skills provide students opportunities to understand real life situations and scenarios (i.e. coping with disaster), and solve challenges in a controlled environment or make use of them in simulating cultural experiences by locating/transposing them in new (local, regional, national and international) situations.

4. Case Studies:

Case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of

knowledge domain concerned.

5. Role Playing

Assuming various roles, as in real life, is the key to understanding and learning. Students are challenged to make strategic decisions through role-plays, and to analyze the impact of these decisions. For this purpose, incidents from literary texts may also be used.

6. Team Work

Positive collaboration in the form of teamwork is critical in the classroom environment, for which it is necessary to transcend one's prejudices and predilections so as to achieve the desired outcomes. In the process of teamwork, learners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

7. Study Tours/Field Visits:

Study Tours/ Field trips provide opportunities to the learners to test their in-class learning in real life situations as well as to understand the functional diversity in the learning spaces. These may include visits to sites of knowledge creation, preservation, dissemination and application. Institutions may devise their own methods to substitute/modify this aspect.

8. Academics-Industries Interface:

The course curriculum of M.A./M.Sc.in Geography should encourage students for closer interaction with industries/corporate/research institutes, etc. for at least one-month internship and training.

1.7 ASSESSMENT METHODS:

1.7.1 Alignment of Programme Learning Outcomes and Course Learning Outcomes:

The assessment of students' achievement in geography will be aligned with course/program learning outcomes and the academic and geographical skills that the program is designed to be developed. Different assessment methods that are appropriate within the discipline of geography will be used. Learning outcomes will be assessed through continuous evaluation using the oral and written examinations, cartographic and computer based exercises (Geo-informatics), practical assignments, observations of practical skills, project and field work reports, seminar presentations, Group discussions, viva voce, output from collaborative work activities and attendances, etc.

1.7.2 Assessment priorities:

The End Semester evaluation consists of 70% and the internal evaluation consists of 30% which includes 15% for sessional examinations, 9% for Assignments, Group Discussions & Seminars and 6% for student's attendance, involvements and participation in various departmental activities.

Progress of learners towards achieving learning outcomes may be assessed making creative use of the following, either independently or in combination: time-constrained examinations (say 1-hour or 3-hour tests); report writing/prepareing essays based on data collected from the field; problem based assignments; real life simulations; observation of practical skills (speaking, listening, problem solving within a peer group or a class); individual project reports (case-study or term papers within a given word limit); team project reports; oral presentations, including seminar presentation; viva voce, interviews; computerised adaptive testing for MCQ; peer and self-assessment etc., and any other pedagogic approaches as may be relevant keeping in view the learners' level, credit load and class size.

1.7.3 Diversity in Assessment Methods: Allowing for the diversity in learning and pedagogical methods adopted by different universities and institutions, stakeholders (Academic Councils, Boards of Studies or statutory bodies) are expected to ensure that the objectives of the course(s) are clearly aligned to learning outcomes. It is expected that the curricula developed by institutions will maintain a transparent roadmap of (a) pedagogical methods and priorities and (b) learning outcomes that reflect the weightage points given to different aspects of skills and achievements identified in the recommendations.

1.7.4 Learning Outcome Index:

The course learning outcomes are aligned with program learning outcomes but these are specific-to-specific courses offered in a program. The course level learning shall be reflected as program level learning. The core courses shall be the backbone of this framework whereas discipline specific electives, generic electives and skill enhancement courses and no-credit mandatory courses would add academic excellence in the subject together with multi-dimensional and multidisciplinary approach.

In course learning outcomes, the student will attain subject knowledge in terms of individual course as well as holistically. The example related to core courses and their linkage with each other is stated below:

Table 1															
Program me outcomes	Core courses														
	Cou rse 1	Cou rse 2	Cou rse 3	Cou rse 4	Cou rse 5	Cou rse 6	Cou rse 7	Cou rse 8	Cou rse 9	Cou rse 10	Cou rse 11	Cou rse 12	Cou rse 13	Cou rse 14	Cou rse 15
Outco mes 1	X	X		X	X	X			X	X		X	X		
Outco mes 2		X					X	X						X	X
Outcomes 3	X	X	X	X		X	X	X						X	X
Outco mes 4	X	X												X	X
Outco mes 5							X				X		X	X	X
Outco mes 6					X				X	X	X		X		X

Table 2 Discipline Specific Electives											
Programme outcomes	DSE1	DSE2	DSE3	DSE4	DSE5	DSE6	DSE7	DSE8	DSE9	DSE10	DSE11
Outcome 1	X	X	X						X	X	X
Outcome 2	X	X		X	X	X	X				
Outcome 3	X	X	X	X	X	X	X	X	X	X	
Outcome 4	X	X	X	X		X	X				
Outcome 5						X	X	X	X	X	X
Outcome 6									X	X	X

Table 3					
Programmeout comes	Skill Enhancement Courses				
	Course 1				
Outcome 1	X				
Outcome 2					
Outcome 3	X				
Outcome 4					
Outcome 5	X				
Outcome 6	X				

1.7.5 Weightage Distribution: An institution may, for example, opt for a 30:70 weightage distribution system while assessing in-semester and end-semester activities. In such a case, in-semester activities may be accorded different weightage points in terms of activities such as sessional examinations(15),seminar/group discussion/co-curricular activities(9) and punctuality and regularity or any other responsibility indicator (6). For project based course opt for 70:30 weightage distribution system where project progress report (30), pre-submission presentation (30) and final presentation(30) given. Similarly, end-semester or summative assessment methods may include written tests, either written or in combination with oral components, as may be necessary, keeping in view the class size and the credit load in a given semester. Questions set in the end semester examinations may be a combination of essay type questions, short notes and objective MCQ (multiple choice questions). The credit hour distribution (L-T-P) has to be rationalized accordingly.

1.7.6 Innovation and Flexibility: Within each category, institutions are expected to encourage instructors to bring in innovative and flexible methods to guarantee the fullest realization of Learning Outcomes outlined in the document. All such instructional and assessment requirements must be clearly communicated to all stakeholders at the time of course registration. Any subsequent change or minor modification necessary for fuller realization of learning outcomes must be arranged with due notice and institutional arrangement at the relevant level.

1.7.7 Freedom and Accountability: Freedom and accountability of the stakeholder are key attributes that determine the success of the Learning Outcome Framework. For example, in research work, learners may be asked to pay attention to library work or field and laboratory-based work, originality of ideas, formulation of arguments, and creativity. Components may be assigned weightage points accordingly (say, out of 15 points). The excellence of institutions will be increasingly determined by Learning Outcomes rather than programme or course objectives. Hence it is necessary to innovate continually in learning and assessment in order to ensure meaningful and socially relevant learning (with transparent Learning Outcomes indices) rather than rote learning.

1.7.8 Clustering of Activities: Each cluster of activity may be assigned weightage points in accordance with the priorities of the institution without diluting the principles given in the LOCF. So, an institution may choose to have any or all of the following in its in-semester activities with clear and transparent methods of communication to learners: open viva voce, group quiz or individual, classroom simulations and problem-solving activities, library or field visits, term papers, individual and group reports, poster presentations. Credit hour and L-T-P distribution shall be crucial to any such clustering.

1.7.9 Review and Amendment: It is important for institutions to review, periodically and without fail, the efficacy of any method adopted to meet the learning outcomes proposed in the LOCF recommendations. Institutions are also required to make statutory provisions to adapt/modify/amend rules and clauses as may be necessary without violating the spirit of the larger programme outcomes outlined by the UGC in the CBCS guidelines.

1.7.10 Spirit Rather than Letter of the LOCF: The guidelines for assessment given here and elsewhere in the LOCF recommendations are indicative rather than exhaustive. So, institutions are expected to frame assessment modes and criteria relevant to their situation and context, in keeping with the spirit of the LOCF. The basic idea of LOCF is that learners at this level should understand their position(s) in the light of regional, national and global perspectives—must find a true and transparent reflection in the assessment.

1.8 Keywords

Geography, research-methodology, cultural interaction, global understanding, development, evolution, cartography, digital cartography, GIS & Remote Sensing, regional development, regional planning, economic development, agriculture, rural & urban development, environment, ecology, social structure, social and environmental issues.

Detailed Syllabus



Course Code	Title	Credit	Nature of Course (T/P)	Distribution of Marks		
				IA	End Semester	Total
Semester-I						
MGE 101	Fundamentals of Geomorphology (CC 1)	4	T	30	70	100
MGE 102	Geographical Thoughts (CC 2)	4	T	30	70	100
MGE 103	Regional Geography: India and NE India (CC 3)	4	T	30	70	100
MGE 104	Introduction to Environment and Ecology (CC 4)	4	T	30	70	100
MGE 105	Cartographic Techniques-I (Practical) (CC 5)	4	P	30	70	100
TOTAL		20		150	350	500
Semester-II						
MGE 201	Climatology and Oceanography (CC 6)	4	T	30	70	100
MGE 202	Socio - Cultural and Political Geography (CC 7)	4	T	30	70	100
MGE 203	Geography of Rural and Urban Development (CC 8)	4	T	30	70	100
MGE 204	Fundamentals of Cartography (CC 9)	4	T	30	70	100
MGE 205	Cartographic Techniques-II (Practical) (CC 10)	4	P	30	70	100
TOTAL		20		150	350	500
Semester-III						
MGE 301	Research Methodology (CC 11)	4	T	30	70	100
MGE 302	Quantitative Techniques (SEC 1)	4	T	30	70	100
MGE 303	Fundamentals of Geoinformatics (CC 12)	4	T	30	70	100
MGE 304 A	Regional Planning: Principles, Concepts and Theories (DSE 1)	4	T	30	70	100
MGE 304 B	Hazards and Disaster Management: Basic Concepts (DSE 2)	4	T	30	70	100
MGE 304 C	Geoinformatics: Principles and Techniques of Remote Sensing (DSE 3)	4	T	30	70	100
MGE 305	Geoinformatics (General) Practical (CC 13)	4	P	30	70	100
MGE 306	Northeast India: Land, People and Culture (GE 1)	4	T	30	70	100
TOTAL		24		180	420	600
Semester-IV						
MGE 401	Geography of Economic Activities (CC 14)	4	T	30	70	100
MGE 402 A	Regional Planning: Practices in India and Selected Countries (DSE 4)	4	T	30	70	100
MGE 402 B	Hazards and Disaster Management: Preparedness and Mitigation (DSE 5)	4	T	30	70	100
MGE 402 C	Geoinformatics: Principles and Techniques of GIS (DSE 6)	4	T	30	70	100
MGE 403 A	Regional Planning: Rural and Urban Development Planning in India (DSE 6)	4	T	30	70	100
MGE 403 B	Hazards and Disaster Management: Issues and Policies (DSE 7)	4	T	30	70	100
MGE 403 C	Geoinformatics: Applications in Major Areas (DSE 8)	4	T	30	70	100
MGE 404 A	Regional Planning (Practical) (DSE 9)	4	P	30	70	100
MGE 404 B	Hazards and Disaster Management (Practical) (DSE 10)	4	T	30	70	100
MGE 404 C	Geoinformatics (Practical) (DSE 11)	4	T	30	70	100
MGE 405	Dissertation (CC 15)	4	P	70	30	100
MGE 406	Disaster Management (GE 2)	4	T	30	70	100
HVP 740	Human Values and Professional Ethics	NCM*	T	15	35	50
TOTAL		24		235	415	650

IA= Internal Assessment **T**= Theory **P**= Practical (*Fieldwork/Dissertation/Project etc.*)

CC= Core Course **DSE**= Discipline Specific Elective **GE**=Generic Elective (Multidisciplinary Course)

SEC=Skill Enhancement Course **NCM**= Non Credit Mandatory

SEMESTER – I

MGE 101: Fundamentals of Geomorphology

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: *This course focuses the fundamental concepts of geomorphology which includes the study of landform structure, factors controlling landform development, processes, cycles and recent trends in geomorphology including the applied aspects of the discipline.*

Course learning outcomes

1. Students will understand the basic concepts of geomorphology
2. Students will learn different endogenic and exogenetic processes.
3. Students will have knowledge on landform structure & factors controlling landform development
4. Students will understand cycles of landform development.
5. At the end of the course students will get the knowledge & information about the applied field of Geomorphology.

UNIT - I: Basics of Geomorphology

(15 hrs)

Definition, nature and scope of geomorphology. History and development of geomorphic thoughts. Recent trends in geomorphology. Fundamental concepts of Catastrophism, Uniformitarianism, Neo-catastrophism and Equilibriums, Systems approaches and threshold concept.

UNIT - II: Endogenetic processes

(15 hrs)

Basics of plate tectonics, plate margins & boundaries, types & distribution of plates; Faulting, folding and their geomorphic expressions. Earthquake - concept, causes, classification, intensity and magnitude, geographical distribution. Vulcanism - concept, mechanism and causes; Volcanoes- classification, volcanic materials; Topography associated with vulcanicity and their geographical distribution.

UNIT - III: Exogenetic processes

(15 hrs)

Weathering, erosion and mass wasting - meaning and concept, controlling factors, classification and significance. Dynamics of fluvial, aeolian, glacial and karst processes and resulting landforms.

UNIT - IV: Applied Geomorphology

(15 hrs)

Meaning; Applications of geomorphology in regional planning, engineering projects, mineral exploration and hydrology. Drainage basin morphometry, Applications of space technology in geomorphological studies, Regional Geomorphology of Northeast India - A Case study.

Note: *Seminar and Group discussion may be incorporated during class hour. Home assignments - Drawings of geographical features of various environments, major plates, volcanic zones of the earth etc (Compulsory - any four)*

References:

1. Dayal, P. 1990: *A Text Book of Geomorphology*, Shukla Book Depot, Patna.
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3. Singh, Savinder 2018: *Geomorphology (Revised Edition)*, Prayag Prakashan, Allahabad.
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5. Strahler, A. 2006: *Introduction to Modern Physical Geography*, John Wiley & Sons, New York.
6. Wooldridge, S. W and Morgan, R.S. 1991: *An Outline of Geomorphology*, Orient Longmans, Calcutta.
7. Hess, D. 2011: *Mcknight's Physical Geography - A landscape Appreciation*, PHI Learning Private Limited, New Delhi.
8. Hart, M. G. 1991: *Geomorphology : Pure are and Applied*, CBS Publishers and Distributors, Delhi-32.

MGE 102: Geographical Thoughts

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The objective of this course is to look back into the historical developmental concepts and approaches of geography and modern approaches in geography.

Course learning outcomes

1. Students will understand about the historical developmental concepts of Geography
2. Students will know theories of Geography
3. Students will know modern concepts of Geography
4. Students will understand contemporary trends on the topic.
5. At the end of the course students will have knowledge about different models investigating geographical facts.

UNIT - I: Development of Geography and Approaches

(15 hrs)

Development of Geography through ages – contributions of Greek, Roman, Arabs, Indians. Man-environment interaction: Neo environmentalism, Place of Geography among sciences, Ideographic and nomothetic approaches in Geography.

UNIT - II: Concepts in Geography

(15 hrs)

Concepts: space, place, environment, time and spatial organization, spatial diffusion; spatial interaction, Region and regional typology; Culture and cultural landscape.

UNIT - III: Modern Approaches

(15 hrs)

Schools of geography, dualism and dichotomies; Philosophy and geography: Paradigm shifts; Quantitative revolution and challenges.

UNIT - IV: Contemporary Trends

(15 hrs)

Radicalism, Humanism, Positivism, Pragmatism, Existentialism; Qualitative paradigm; Behavioural revolution: perception and cognition, mental maps; Marxism; Postmodernism; Post-structuralism and Post-colonialism, Feminism.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Models of man-environment interaction, spatial diffusion and interaction, charting of approaches and schools of geography, paradigm shifts and stages of quantitative revolution (Compulsory - any four).

References:

1. Adams, P., Steven, H. and Karel, T. (eds.) 2001: *Texture of Place. Exploring Humanistic Geographies*. University of Minnesota Press, Minneapolis.
2. Barnes, T. and Gregory, D. (eds.) 1997: *Readings in Human Geography: The Poetics and Politics of Inquiry*. Arnold, London.
3. Daniels, P., Bradshaw, M., Shaw, D. and Sidaway, J. 2000: *An Introduction to Human Geography. Issues for the 21st Century*. Prentice Hall, London.
4. Dear, M. J. and Flusty, S. 2002: *The Spaces of Postmodernity: Readings in Human Geography*. Blackwell Publishers, Oxford.
5. Dikshit, R. D. 2004: *Geographical Thought: A Critical History of Ideas*. Prentice-Hall of India, New Delhi. (in English and Hindi).
6. Harvey, M. E. and Holly, P.B. 2002: *Themes in Geographic Thought*. Rawat Publications., Jaipur and New Delhi.
7. Hubbard, P., Kitchin, R., Bartley, B. and Fuller, D. 2002: *Thinking Geographically: Space, Theory and Contemporary Human Geography*. Continuum, London.
8. Johnston, R, Gregory D, Pratt G, Watts M. and Whatmore S. 2003: *The Dictionary of Human Geography*. Blackwell Publishers, Oxford. 5th edition.
9. Rana, Lalita 2008: *Geographical Thought: A systematic Record of Revolution.*, Concept Pub., New Delhi
10. Rana, Laita 2014: *Geographical Thought Classical to Contemporary (Revised and enlarged).*, Concept Pub., New Delhi

MGE 103: Regional Geography: India and NE India

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total Hours: 60

Total marks: 20 marks - 20 objective type questions (*from all units*)
50 marks – Set of 08 descriptive type questions of 10 marks (*Two from each unit*)

Objective: The objective of this course is to give students about the concept of region and regional planning. It also aims to give the idea of the concept of regional geography of India and North East India under various categories.

Course learning outcomes

1. Students will understand physical basis of Geography of India
2. Students will acquire knowledge on population & economy of India
3. Students will know physical basis of Geography of North East India
4. Students will get knowledge on population & economy of North East India
5. At the end of the course students will get an in-depth knowledge about agricultural & industrial scenario of the country.

UNIT - I: Geography of India: Physical Basis

(12 hrs)

India as a geographical unit and its locational significance, Physical environment: physiographic characteristics – drainage, climate, soil and natural vegetation regions of India, watershed as a planning region.

UNIT - II: Population and Economy of India

(18 hrs)

Population characteristics: peopling process, growth, distribution, density, structure and composition; Agriculture: Agricultural development and Indian economy, modernization of agriculture, agro-climatic regions, agricultural trade. Industry: Industrial development and Indian economy, distribution production pattern of major Industries (Iron and steel, cotton textile, petrochemicals, sugar, paper and cement industries), Transport: Roads and railways, air transport and pipe transport

UNIT - III: Geography of North East India: Physical Basis

(15 hrs)

Locational significance- physiography, drainage systems, natural hazards, climate, soil and natural vegetation.

UNIT - IV: Population and Economy of North East India

(15 hrs)

Population characteristics: peopling, growth, distribution and density, age sex composition, rural-urban composition and religious composition. Economic basis: Agriculture, Industries and Transport, economic potentialities and backwardness.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Map works (Location, Physiography, Climate, Vegetation, Soil, Natural Vegetation, Hazard prone areas, locations of various industries, road, railways and air connectivity maps) as home assignments (Compulsory: Any four)

References:

1. Deshpande C.D. 1992: *India - A Regional Interpretation*, Northern Book Centre, New Delhi.
2. Govt. of India: *India-Reference Annual, 2001*: Pub. Div., New Delhi.
3. Govt. of India: *National Atlas of India* NATMO Publication, Calcutta.
4. Govt. of India: *The Gazetteer of India*. Vol. I & III Publication Division.
5. Learmonth A.T.A et.al (ed) *Man and land of South Asia*, Concept, New Delhi
6. Shafi, M: *Geography of South Asia*, McMillan & Co., Calcutta, 2000.
7. Singh, Gopal, 1988. *Geography of India*, Atma Ram, Delhi.
8. Gopal Krishnan, R., 1996. *Geography of India*, Jawahar Pub. & Dist., New Delhi.

MGE 104: Introduction to Environment and Ecology

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The study deals with the concepts of ecology and environment in relation to geography and their issues related to ecosystem and its management.

Course learning outcomes

1. Students will understand the concept of biosphere
2. Knowledge on different ecosystems will be easy
3. Understanding environmental problems will be easy
4. Students will come to know about environmental issues, management.
5. At the end of the course students will have concept of sustainability.

UNIT - I: Geographical Perspectives on Environment and Ecosystem (15 hrs)

Population, Resources and Environment; Biosphere: its concept and components, Ecology: definition, scope, concept and principles, Components of Ecosystem, Soil as component of environment, soil forming processes and factors, Soil horizon, Physical and Chemical properties of soil, Soil types and their characteristics.

UNIT - II: Forest, Desert and Coastal Ecosystem (15 hrs)

Forest Ecosystem: Processes and Patterns; Desert Ecosystem, Desertification - Process and Patterns; Management Strategies, Coastal Ecosystem: Mangroves.

UNIT - III: Environmental Issues and Management (15 hrs)

Environmental Problems and their Management-Air, Water, Noise, Solid Waste and Coastal pollution, Emerging environmental issues; Biodiversity: conservation and threat; Environment and sustainable development; Environmental degradation. Environmental monitoring and environmental management

UNIT - IV: Biogeography (15 hrs)

Meaning, scope, bio-geochemical cycles – flow of energy, hydrological cycles, oxygen cycle, nitrogen cycle, food chain, Biomes, Biogeographic regions of the world.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Population growth chart of India and the World 1901 - 2011, Biosphere, Soil horizons, Flow of energy in the ecosystem, Distribution of Biomes, Hydrological cycle, Biogeographic regions (Compulsory- Any four).

References:

1. Balakrishnan, M., 1998: *Environmental Problems and Prospects in India*, Oxford & IBH Pub.,
2. Hussain, M., (ed.) 1996: *Environmental Management in India*, Rawat Pub., Jaipur
3. Hooja, R., et. al., (ed.) 1999: *Desert, Drought and Development: Studies in Resource Management and Sustainability*, Rawat Pub, Jaipur
4. Munn, T., (ed.) 2001: *Encyclopaedia of Global Environmental Change*, John Wiley & Sons, West Sussex
5. Saxena, H.M., 1999: *Environmental Geography*, Rawat Pub., Jaipur.
6. Singh, R.B., (ed.) 1990: *Environmental Geography*, Heritage Pub., New Delhi.
7. Singh R.B., (ed.) 2001 : *Urban Sustainability in the Context of Global Change*, Science Pub., Inc., Enfield (NH), USA
8. Singh, S., 1997: *Environmental Geography*, Prayag Pustak Bhawan, Allahabad.
9. Kormondy, Edward J, 2009: *Concept of Ecology*, Fourth edition
10. Stiling, Peter; 2010: *Ecology*, Fourth edition

MGE 105: Cartographic Techniques-I (Practical)

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total marks:	01 question of 20 marks – 20 marks
	02 questions of 15 marks each – 30 marks
	Practical book – 10 marks
	Viva voce – 10 marks
Duration of End Semester Examination	: 4 Four hours (with 3 questions)
Duration of Sessional Examination	: 2 hours (with 2 questions of 15 marks each)

Objective: The objective of this paper is to learn professionalism with different practical analysis of the subjects of geomorphology, physical, socio-economic aspects of geographical studies of any chosen theme by using graphic, cartographic and carto-statistical techniques.

Course learning outcomes

1. Students will learn practical knowledge on morphometric analysis from topographical sheets
 2. Students will learn preparation of climatic maps and diagrams
 3. Students will know on zoo-geographical regions of the world
 4. Students will know soil distribution of India and the world.
 5. At the end of the course students will have the knowledge about population growth & its impact on urbanisation.
-
1. Preparation of relative relief map (1 exercise).
 2. Preparation of slope map by Wentworth's method and its analysis (1 exercise).
 3. Drainage morphometry: drainage basin delineation and stream ordering, Computation and interpretation of (i) bifurcation ratio, (ii) length ratio, (iii) basin circulatory ratio (1 exercise).
 4. Preparation of drainage density map and its interpretation and analysis (1 exercise).
 5. Preparation of stream frequency map and its interpretation and analysis (1 exercise).
 6. Drawing long profile of a basin area and its interpretation (1 exercise).
 7. Drawing of cross profile of a basin area and its interpretation (1 exercise).
 8. Drawing of hypsometric curve (of a basin area / any selected area) and its interpretation (1 exercise).
 9. Preparation of distribution map of urban population of India (only selected 10 - 20 largest cities) and the capital towns / cities of North East India by sphere method (2 exercises).

10. Preparation of one quantitative choropleth map of any socio-economic theme from India / NE India using natural breaks / standard deviations or equal intervals method (1 exercise).
11. Isopleth Mapping of distribution of rainfall and variability of rainfall of given data set for rain gauge stations or any other data of point locations (2 exercises).
12. Laboratory Note Book and Viva-voce.

Note: Each and every exercise including home assignment should contain the Date of Assignment and Date of Submission written on appropriate location of the exercise sheet, which is to be duly signed by concerned teacher on or before the date of submission. There should not be more than 7 days between these two dates for each exercise to be completed on regular basis by the student maintaining a standard practical note book. The student can appear for the sessional or end semester examination on practical by submitting completed assigned exercises only.

References:

1. Monkhouse F.J. and Wilkinson, H. R, 1989: *Maps and Diagrams*, B. I. Publications, New Delhi.
2. Singh R.L. And Singh, R. P. B, 1992: *Elements of Practical Geography*, Kalyani Publishers, New Delhi.
3. Sarkar, A., 1997: *Practical Geography: A Systematic Approach*, Orient Longman, Calcutta
4. Gregory, K. J. And Walling D. E., 1973: *Drainage Basin Forms and Processes*, Arnold, London
5. Morisawa, M. 1968: *Streams: Their Dynamics and Morphology*, Edward Arnold, London.
6. Goudie , A. Et al, 1981: *Geomorphological Techniques*, George Allen & Unwin, London

SEMESTER - II

MGE 201: Climatology and Oceanography

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The study of climatology and oceanography which are a part under physical geography deals with the basic concept and classification of climatology and oceanography and their applied approaches in present day context.

Course learning outcomes

1. Student will learn basic concepts and classification of climatology
2. Students will understand basic concepts and classification of oceanography
3. This course will provide knowledge on applied climatology
4. Students will have knowledge on applied oceanography.
5. At the end of the course students will Understanding impact of climatic factors on human lives.

UNIT - I: General Climatology

(18 hrs)

Meaning and scope of climatology. Structure and composition of the atmosphere. Heat budget and insolation. Atmospheric equilibrium, air masses and fronts. Planetary wind system and Atmospheric disturbances: Global Pressure belts, cyclones, tornadoes and water spouts. Monsoon and Jet streams; Classification of climate by Trewartha, Koppen and Thornthwaite; World distribution of major climatic types; Causes of long term climate change.

UNIT - II: Applied Climatology

(15 hrs)

Climate and biosphere. Climate and human environment: agricultural and industrial. Climate, urbanization and urban planning. Weather forecasting and recent trends in climatology. Air pollution, global warming. El Nino, La Nina and climatic change. Micro climates.

(15 hrs)

UNIT - III: General Oceanography

(15 hrs)

Meaning and scope of oceanography. Submarine topography and configuration of Pacific, Atlantic and Indian ocean floors. Ocean temperature and salinity. Ocean dynamics: currents, tides, tsunamis. Ocean deposits. Coral reefs.

UNIT - IV: Applied Oceanography

(12 hrs)

Ocean routes and world economics. Marine resources and their conservation. Marine Pollution and ocean dumping. Global warming and transgression of seas. Remote sensing in oceanographic studies.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Structure of atmosphere, heat budget, pressure systems of the world, wind systems, bottom configuration of Pacific, Atlantic and Indian ocean, Ocean currents, Coral reefs, Marine resources (Compulsory - any four)

References :

1. Barry, G. G. and Chorley, R. J. 1976: *Atmosphere, Weather and Climate*, Methuen and Co., London.
2. Barret, E.C. 1974: *Climatology from Satellites*, Methuen London.
3. Critchfield, H. J., 2011: *General Climatology*, Prentice-Hall of India Pvt. Ltd., New Delhi.
4. Davis, R. J. A., 1986 : *Oceanography-An Introduction of the Marine Environment*, Win C. Brown, Iowa.
5. Hobbs, J. E., 1996: *Applied Climatology*, Oxford University Press.
6. Lal, D. S. 2010: *Climatology and Oceanography*,
7. Hussain, T. and Tahir, M. 2003: *Climatology*, Jawahar, New Delhi.
8. Hussain, T. and Tahir, M. 2003: *Oceanography*, Jawahar, New Delhi.
9. Siddhartha, K. 1999: *Oceanography-A Brief Introduction*, Kisalya Pub., New Delhi.
10. Singh, S. 2002: *Physical Geography*, Prayag Pub., Allahabad.
11. Oliver and Hidore, 2010: *Climatology: An Atmospheric Science*, Pearson Education. Singapore

MGE 202: Socio-Cultural and Political Geography

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The objective of the paper is related to socio-cultural study of the spatial distribution of ethnicity and their cultural association while political geography deals with the geographical aspects of global politics.

Course learning outcomes

1. Student will learn socio-cultural study of the spatial distribution of ethnicity
2. Students will understand cultural association
3. Understanding political geography will be easy
4. Students will understand geopolitical significance of contemporary India
5. At the end of the course students will understand changing nature of political maps of the world & India will be easy.

UNIT - I: Fundamental Concepts, Patterns And Processes

(15 hrs)

Definition, scope and development of Social and Cultural Geography with special reference to India. Concepts of social space, social area analysis and social well-being, cultural landscape. Cultural realm and their distribution. Modernisation and social change - pattern and processes in the traditional societies.

UNIT - II: Social Structure and Issues in India

(12 hrs)

Distribution of racial and linguistic groups of India and their socio-economic issues. Levels of social well-being in India / HDI. Regional consciousness and national integration. Social conflicts and violence.

UNIT - III: Basics of Political Geography:

(18 hrs)

Development of Political Geography through ages; Geographic elements and the state; Physical Elements; Human Elements; Economic Elements; Political Geography and Environment Interface. Themes in political geography: State, Nation, Nation-state and Nation-building; Frontiers and Boundaries; Colonialism, Decolonization, Neo-colonialism, Federalism and other forms of governance. The changing patterns of World Powers Perspectives on core periphery concepts, Conflicts cooperation. Politics in world resources.

UNIT - IV: Geopolitical Significance of Contemporary India

(15 hrs)

Geopolitical significance of Indian ocean; Political scenario in SAARC region, South East Asia, Middle East. Political Geography of contemporary India - The changing Political map, Centripetal and Centrifugal forces, Stability and Instability, Inter- state issues (water disputes and riparian claims) and Conflict Resolutions Insurgency in boarder states; Emergence of New States and Federal India.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignment - Mapping of social, racial and linguistic groups in N. E. India / India / SAARC countries/South East Asia and Middle East; Changing political scenario of North East India since independence (Compulsory - any four).

References:

1. Taher, M 1994 : *An Introduction to Social Geography*, NEIGS
2. Sharma, H. N., 2000: *Social Geography*, in Singh J (ed) *Progress in Indian Geography*, (1996-2000) INSA, New Delhi

3. Sopher D.E. 1980 : *An Exploration of India : Geographical Perspective on Society and Culture*, Longman, London
4. Ahmed, A. 1999: *Social Structure and Regional Development*, Rawat Publication, Jaipur.
5. D. M. Smith 1995: *Geography and Social Justice*, Black-well.
6. Dube, S.C. 1991: *Indian Societies*, National Book Trust of India, New Delhi.
7. Dube, S.C, 1980: *Tribal Heritage of India*, Vikas Publishing Co., New Delhi.
8. Smith D.M., 1974: *Geography of Social Well Being*, Wiley, New York
9. D Blij, H J and Glassner, M. 1968: *Systematic Political Geography*, John Wiley, New York.
10. Dikshit, R. D. 1996: *Political Geography: A Contemporary Perspective*, Tata McGraw Hill, New Delhi.
11. Deshpandey, C.D. 1992: *India – A Regional Interpretation*, Northern Book Centre, New Delhi.
12. Adhikari, S. 1996: *Political Geography*, Rawat Publications Jaipur & New Delhi

MGE 203: Geography of Rural and Urban Development

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The subject rural and urban geography which is a part of human geography deals with the issues of rural development and urban planning and management.

Course learning outcomes

1. Students will understand about rural development
2. Students will understand the issues of rural development
3. Students will understand urban planning
4. Students will have knowledge about management of rural and urban issues.
5. At the end of the course students will understand origin & development of urban area.

Unit - I: Rural Systems and Setting

(15 hrs)

Meaning, concept and scope of rural development. Recent trends in rural development, Rural settlements, Spatial and Ecological Approaches, Morphology of rural settlements; Rural dwellings: basic infrastructures and rural people's participation, rural population (distribution, density, composition and migration), rural infrastructure planning.

UNIT - II: Urban Bases and Characteristics

(15 hrs)

Meaning and scope of urban geography; Recent trends in urban geography; Urban population: characteristics, processes and trends of urbanisation; Methodology in urban studies; Origin and evolution of urban settlements; Distribution of urban centres. Characteristics of cities in different historical periods (both industrial and pre-industrial); Functions and functional classification of towns; Urban transportation, Major issues of urban planning and management, Characteristics of smart city.

UNIT - III: Spatiality and Models

(15 hrs)

Size and spacing of cities: Rank-size rule; Law of the primate city; Urban hierarchies; Central Place Theory (Christaller and Lösch); Urban land use and functional morphology: functional areas and peri-urban areas; Theories of urban structure (Burgess, Hoyt, Harris and Ullman, Mann, White).

Unit - IV: Rural-Urban Issues

(15 hrs)

Rural-Urban Continuum, Rural and Urban problems: environmental, poverty, slums, transportation, housing, crime; Rural-Urban Migration, Goals of sustainable rural-urban development, Planned cities-

Chandigarh and Jaipur; Basic consideration in preparation of Town / City Master Plans: A case studies of Guwahati and Shillong.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignment- House types of North East India, Proportion of rural and urban population in the states North East India by pie-charting, Goals of sustainable rural / urban development, Christaller's Model of rural urban hierarchy, Model of urban structure of Hoyt / Burgess/ Ullman, Smart city / village (Compulsory - any four).

References:

1. Hall, P. 1992: *Urban and Regional Planning*. Routledge, London.
2. Hall, T. 2001: *Urban Geography*. (2nd edition). Routledge, London.
3. Jacquemin, A. 1999: *Urban Development and New Towns in the Third World – A Lesson from the New Bombay Experience*. Ashgate, Aldershot, UK.
4. Paddison, R. (ed.) 2001: *Handbook of Urban Studies*. Sage, London.
5. Pacione, M. 2005: *Urban Geography: A Global Perspective*, Routledge, London and New York.
6. Ramachandran, R., 1991: *Urbanisation and Urban Systems in India*. Oxford University Press, Delhi.
7. Singh, S. B. (ed.) 1996: *New Perspectives in Urban Geography*. M.D. Publications, New Delhi
8. Chambers, R. 1997: *Whose Reality Counts? Putting the First Last*, Intermediate Technology Publications, London.
9. Desai, A. R. 1990: *Rural Development*, Popular Prakashan, Bombay.
10. Singh, R. Y. 2015: *Geography of Settlements*, Rawat Publication, New Delhi
11. Chandna, R. C. 2007: *Geography of Population*, Kalyani Publishers, New Delhi

MGE 204: Fundamentals of Cartography

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (from all units) 50 marks – Set of 08 descriptive type questions of 10 marks (Two from each unit)

Objective: The objective of this paper is to give exposure to the art and science of making map. Principles and different techniques for map creation and representation of real world phenomena through maps following manual and digital techniques are emphasized.

Course learning outcomes

1. Students will learn the art and science of making maps.
2. Students will understand the principles and different techniques for map creation
3. Students will get knowledge about representation of real world phenomena through maps.
4. Students will learn manual and digital techniques of map making.
5. At the end of the course students will Understand cartographic concepts & techniques.

UNIT - I: Fundamentals of Cartography

(15 hrs)

The nature and scope of cartography, traditional versus modern cartography. Concept of base map and map types, principles of map design and layout. The Earth: shape and size, the earth models, Coordinate systems - Geographic / Global (latitude and longitude), Planar coordinates and Projected coordinate systems; Direction, distance and area in maps; Concept of map scale, Spatial resolution in satellite based maps and accuracy in representation of features. Thematic mapping types and techniques.

UNIT - II: Principles of Surveying

(15 hrs)

Principles of plane and geodetic surveying, Types of surveying, Principles of triangulation, Principles and techniques of surveying by Plane Table (Open traverse survey), Prismatic Compass (Open and closed traverse), Dumpy Level (Profile drawing and contouring) and Theodolite (determination of height of an object and Closed traverse survey).

UNIT - III: Map Projection

(15 hrs)

Map projection – Definition, classification and history of map projections, Basic principles of constructing Zenithal Gnomonic Projection (Equatorial case), Zenithal Orthographic Projection (Polar case) cylindrical (Equal area and Mercator's) and conical projections (Lambert's Equal area and Bonne's), Concept of orthomorphism, equal-area, equi-distance, Choice of map projection for various regions of the world and India.

UNIT - IV: Digital Cartography

(15 hrs)

History and development of Digital Cartography, Digital cartographic systems and tools - Computer Aided Design (CAD), Geographic Information Systems (GIS), Cartographic and GIS software, web cartography, Map registration / georeferencing; spatial data and their characteristics, nonspatial data, Choropleth and isopleth mapping, DEM data, Terrain mapping and analysis.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Drawing of 3-D globe at various scales and representation of parallels and meridians / latitude - longitude on globe, preparation of map at large scale (1: 10,000 to 1: 1,000) maintaining given distance and direction between the places, Drawing and labelling of survey equipments, Collection of satellite images and drawing of geographic grids (graticules) based on map projection principles (Compulsory - any four)

References:

1. Campbell, J., 1984: *Introductory Cartography*, Prentice Hall Inc., Englewood Cliff
2. Misra, R. P., Singh, R. B., Misra, B. and Pandey A., 2014: *Fundamentals of Cartography*, (2nd Revised Edition) Concept Publishing Company, New Delhi
3. Robinson, A.H., et al 1995: *Elements of Cartography* (6th Edition) John Wiley & Sons, New York
4. Raisz, E. : *Principles of Cartography*, McGraw Hills, London
5. Kenetkar, T.P. and Kulkarni, S. U.: *Surveying and Levelling, Vol. I & II*, Vidyarthi Gritha Prakashan, Pune
6. Kellaway, G.P. 1979: *Map Projection*, Indian Edition, B I Publication, Bombay
7. Talukder, S., 2008: *Introduction to Map Projections*, Eastern Book House, Guwahati.
8. Mahmood, A., 1999: *Statistical Methods in Geographical Studies*, Rajesh Publications, New Delhi.
9. Singh, L. R. & Singh, R. 1991: *Map Work & Practical Geography*, Central Book Depot, Allahabad.
10. Sarkar, Ashis, 1997: *Practical Geography: A Systematic Approach*, Orient Longman Pvt. Ltd., Kolkata.

MGE 205: Cartographic Techniques- II (Practical)

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total marks: 02 questions of 10 marks each – 20 marks
02 questions of 15 marks each – 30 marks
Practical book – 10 marks
Viva voce – 10 marks

Objective: The objective of this paper is to make student familiar with different practical analysis of the subjects of Socio-culture, Politics and different Cartography techniques.

Course learning outcomes

1. Students will understand different practical analysis of the subjects of Socio-culture, Political and different Cartographic techniques.
2. Students will learn to apply surveying techniques.
3. Students will be able to analyse various climatic parameters and their significance
4. Students will understand various aspects of map projection

5. At the end of the course students will have the concept of cartography, techniques & real application.

UNIT - I: Surveying

- i. Plane table surveying (Radiation & Intersection methods)
- ii. Traverse Surveying with Prismatic Compass
- iii. Profile leveling and contouring by Dumpy Level
- iv. Traverse Surveying with Theodolite (Open and Closed Traverse).

UNIT - II: Map Projections

- i. Construction of graticules based on Mathematical derivation and calculation: Zenithal group (polar cases)- Stereographic and Equal-area
- ii. Cylindrical group : Cylindrical Equal Area and Gall's Stereographic projection
- iii. Conical Group: Conical Projection with two standard parallels and Bonne's Projection
- iv. Conventional Group : Sinusoidal

UNIT - III: Mapping / Charting of Socio-economic Data

- i. Pie-graph for representation of a theme: for example land use / cropping pattern/ rural-urban composition / religious composition, etc. (1 exercise)
- ii. Computation and plotting of rank-size rule graph of the towns of Assam / Meghalaya / Nagaland and interpretation thereof (1 exercise).
- iii. Computation and fitting population projection models (2 exercises)
- iv. Computation and plotting of distance decay model (1 exercise)

UNIT - IV: Climatic Maps and Diagrams:

- i. Preparation and interpretation of Climograph, Hythergraph and Wind Rose diagram (3 exercises)
- ii. Aridity Index, P-E and T-E Ratio, Ombrothermic Graph. (Any two exercises)
- iii. Weather Map interpretation and forecasting (1 exercise)
- iv. Visit to a meteorological observatory and submit a report.

Note: Each and every exercise and assignment should contain the Date of Assignment and Date of Submission written on appropriate location of the exercise sheet, which is to be duly signed by concerned teacher on or before the date of submission. There should not be more than 7 days between these two dates for each exercise to be completed on regular basis by the student maintaining a standard practical note book. The student can appear for the sessional or end semester examination on practical by submitting completed assigned exercises only.

References

As cited in the course MGE204

SEMESTER - III

MGE 301: Research Methodology

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: To create a background and awareness of the nature of research process and inquiry. It will expose the student to the methodological problems encountered in interdisciplinary research.

Course learning outcomes

1. Students will understand how to create a basic knowledge and awareness about the nature of research process and inquiry.
2. It also provides student an exposure to the methodological problems encountered and ways to deal in interdisciplinary research.
3. This course will provide knowledge and foundation on different types of research options
4. Students will learn sampling, data collection and data processing.
5. At the end of the course students will have the know of research process.

UNIT - I: Introduction to Research

(15 hrs)

Meaning and characteristics of science and scientific method, steps in scientific method, objectives of research, types of research, research design; research questions, hypothesis: meaning, types, formulation, importance & difficulties; Salient features of good research.

UNIT - II: Sampling and Data Collection

(15 hrs)

Sampling - meaning, types, procedure, selection, merits and demerits, sources of data - primary and secondary, techniques of data collection - empirical observation, questionnaire, interview, schedule & data analysis.

UNIT - III: Data Processing and Analysis

(15 hrs)

Salient features of processing of qualitative and quantitative data, Variable construction, tabulation and charting, Data processing tools - GIS Software packages and their analytical tools, Spreadsheets, SPSS and R, Hypothesis testing and validation with specific examples, Data interpretation, analysis and conclusions.

UNIT - IV: Research Process

(15 hrs)

Introduction to the research problem, Key features of research problem, Survey of literature, Project formulation guide lines; Methods, Techniques and Methodology, Inductive, deductive and model building approaches in geographic research, Structural elements of scientific reporting, Moral and ethical questions in scientific writing, Plagiarism, paraphrasing and copyright violation; Importance of revisions and Specific guide lines on punctuation, using quotations, footnotes, references and bibliography.

Assignment & Seminar:

(15 hrs)

Formulation of a research proposal on a topic related to subject (with a research problem, its brief introduction / background, survey of relevant literature, objectives, research questions, data and methodology to be used, probable outcome and significance of the study) within a specified period followed by a seminar presentation and finalization of topic, collection of relevant data from primary and secondary sources.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Schematic diagram on steps of scientific research, research questions on selected theme of research, designing of questionnaire / schedule, formulation of research project, design of graph / charts from a given data set and

derivation of basic statistics, Structural elements of scientific reporting, model building approach in geography (Compulsory - any four)

References :

1. Wililam J. Goode and Paul H. Hatt, 1981: *Methods In Social Research*, Indian Edition, McGraw Hill, New Delhi
2. Sir Claus Moser and Grham Kalton, 1985: *Survey Methods in Social Investigation*, Dartmouth, New York:
3. Paul Oliver, 2008: *Writing Your Thesis*, 2nd Edition, Sage, New Delhi
4. Bridget Somekh and Cathy Lewin, 2005: *Research Methods in the Social Sciences*, Vistaar, New Delhi
5. Kothari C.R., 2004, *Research Methodogy Methods and Techniques*, New Age International (P) Limited, Publishers, New Delhi.

MGE 302: Quantitative Techniques

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The main objective of this paper is to give the quantitative and qualitative processing and analysis of data for quality research work.

Course learning outcomes

1. Students will understand about the quantitative techniques in research.
2. Students will understand qualitative processing and analysis of data for quality research work.
3. Students will learn the application of quantitative techniques for large data set analysis.
4. Students will learn to implement suitable quantitative techniques for quality research.
5. At the end of the course understanding statistical software's will be easy for the students.

UNIT - I: Introduction to Quantitative Techniques (15 hrs)

Why quantification, Advantages and disadvantages of quantification, General concepts and significance of statistics to applied sciences, Universe / Population, Samples, Variables - Discrete and continuous; Data collection - primary and secondary; Computation of descriptive statistics from grouped and ungrouped data- measures of central tendencies, measures of dispersion / variation, Monte Carlo Analysis, Moments, skewness and kurtosis.

UNIT - II: Geographic Data Matrix and Matrix algebra (15 hrs)

Concept of geographic data matrix, its application in regional, systematic and historical studies of geographic phenomena; Basics of matrix algebra - Definition of matrix, types of matrices, minors and cofactors, determinant, adjoint matrix, inverse matrix; Solutions of systems of equations and development of multiple regression equation.

UNIT - III: Correlation and Regression Analysis (15 hrs)

Concept of correlation and their types; Properties of- simple (linear), nonlinear, partial / multiple correlation; Coefficient of correlation and their properties; Concept of regression, Properties of- simple (linear), nonlinear, partial / multiple regression, Computation of coefficients of regression and their properties, fitting regression equation.

UNIT - IV: Data Reduction Techniques and Statistical Inference - Hypothesis Testing (15 hrs)

Introduction to Cluster analysis and Principal Component Analysis (PCA). Hypothesis and null hypothesis; Types of error, Test of hypotheses- chi square test, T-test, Z-test, F-test and Analysis of variance-one way-ANOVA, Two way ANOVA; Statistical software-SPSS, STASTICA etc.

Note: Seminar and Group discussion may be incorporated during class hour. Home assignments - Computation of basic statistics from a data set, graphical representation of data, design of data matrix, computation of inverse

matrix, drawing of regression lines, ANOVA, t-test, Spreadsheet calculations for Correlation, Regression (Compulsory - any four)



References:

1. Ram Ahuja, *Research Methods*, Rawat Publication, New Delhi.
2. Birdie, Douglas and Anderson, *Questionnaires Design and Use*, The Scarecrow Press, Inc.
3. C.R. Kothari, 2004, *Research Methodology Methods and Techniques*, New Age International (P) Limited, Publishers, New Delhi.
4. Clark, W. A. V. and Hosking, P. L., 1986: *Statistical Methods for Geographer*, John Wiley & Sons, New York.
5. Gregory, S. 1978: *Statistical Methods and the Geographer*, Longman, London
6. Payne, Stanley, *The Art of Asking Question*, Princeton, Princeton University Press.
7. Gupta and Gupta 2005, *Statistical Methods*, Sultan Chand and Sons, New Delhi
8. Mahmood, A. 1999: *Statistical Methods in Geographical Studies*, Rajesh Publications, New Delhi.

MGE 303: Fundamentals of Geoinformatics

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total Hours: 60

Total marks: 20 marks - 20 objective type questions (*from all units*)
50 marks – Set of 08 descriptive type questions of 10 marks (*Two from each unit*)

Objective: To appraise the benefits of geoinformatics in geographical studies and provide direction to take up research on thrust areas for future development in geoinformatics and its application.

Course learning outcomes

1. Students will learn the basic concepts of remote sensing.
2. Students will understand Aerial Photographs and image interpretation.
3. Students will learn principles of Geographical Information System.
4. Principles and methodologies in Global Positioning System will be understood
5. At the end of the course students will learn Global Navigation Satellite System.

UNIT - I: Remote Sensing

(15 hrs)

Definition and basic concept of Remote Sensing, Its history of development; Electromagnetic spectrum and Spectral reflectance; Types of Remote Sensing based on sensor characteristics; Remote sensing Sensors and satellites: Indian and other countries (LANDSAT, IRS, IKONOS, QUICK BIRD, CARTOSAT), Data products and their specifications.

UNIT - II: Aerial Photographs and Image interpretation.

(15 hrs)

Aerial photography : Aerial photographs and their types and sensors; Scale and distortion of aerial photographs; Geometry of vertical aerial photographs, Stereoscopy, Visual interpretation of aerial photographs and satellite images; Elements of image / photo interpretation and interpretation keys. An introduction to Digital Image Processing (DIP) Systems; DIP Techniques: Image enhancements; Supervised and Unsupervised classification.

UNIT - III: Geographical Information System

(15 hrs)

GIS: Introduction, Principles and concept; GIS components and softwares; Spatial and non-spatial data; Raster and Vector data structure, their properties; Georeferencing: coordinate and projection system; datum concept; Thematic mapping of attribute data for points, lines and polygons, Map design and layout.

UNIT - IV: Global Positioning System and Global Navigation Satellite System

(15 hrs)

GPS- Definition, history and fundamentals. Types of GPS; Accuracy of GPS, GPS Signals and errors; Navigation system – GNSS, GLONASS, Galileo, IRNSS; Application areas of GPS/DGPS with focus on surveying and navigation.

Note: Seminar and Group Discussion may be incorporated during class hour. Home assignments - Drawing of Electromagnetic spectrum, List of Remote Sensing data products with specifications by satellite, Scale of aerial photograph, Image classification steps, Georeferencing and digitization flow charting, GIS Components, Data structures, Map Design and layout format, Thematic mapping steps (compulsory - any four)

References:

1. Sabins, F . F. 1987: *Remote Sensing Principles and Interpretation* , W. H Freeman & Co., New York.
2. Guha, P. K. 2013: *Remote Sensing for the Beginner*, Affiliate East West Publishers, New Delhi.
3. Lillesand Thomas M, & Keifer. , 1997: *Remote sensing & Image interpretation* , John Wiley, New York
4. Jensen, J. R. 2011: *Remote Sensing of the Environment – An Earth Resource Perspective*: Pearson Education., New Delhi.
5. Martin, David 2008 : *Geographic Information Systems*: Routledge
6. Heywood, Ian, Cornelius, S. 2011 : *An Introduction to GIS 4th Edition*, Pearson, New Delhi
7. Yadav, R. S. 1997 : *Remote Sensing in Land Evaluation*: , Rajesh Publication, New Delhi.
8. Agarwal, N. K. 2004: *Essentials of GPS* , Spatial Networks Pvt. Ltd., Hyderabad.
9. Gopi, S. 2005: *Global Positioning System Principles and Applications*, Tata McGraw Hill, New Delhi

MGE 304A: Regional Planning: Principles, Concepts and Theories

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: The objective of this paper is to give students an idea about the concept of region and regional planning.

Course learning outcomes

1. Students will understand about the concept of region and regional planning.
2. Students will have an understanding about need of planning for the development of a region.
3. Students will have knowledge about planning at world as well as neighbourhood level.
4. Students will learn various methods and techniques of regional planning.
5. At the end of the course students will understand grass root level planning.

UNIT - I: Conceptual Basis of Regional planning (15 hrs)

Concept of Region: Development of the concept of region, its types and levels; Regionalisation and delineation of Region-; Regionalism, Regional Planning; Concept of planning region; Geography and Regional planning.

UNIT - II: Theoretical framework of Regional planning (12 hrs)

Central Place Theory, Growth Pole Theory, Centre Periphery Theory, Rostow's Stages of Growth.

UNIT - III: Neighbourhood Planning (18 hrs)

Approaches to neighbourhood living in traditional and contemporary societies, elements of neighbourhood structure, Planning and design criteria for modern neighbourhoods, housing and area planning standards, net residential density and gross residential density, development controls and building byelaws in India, UDPFI guidelines, NBC 2005 provisions.

UNIT - IV: Methodology and Techniques of Regional Planning (15 hrs)

Methodology, Techniques-analytical techniques, procedural techniques; Regions for planning-evolution, planning regions, characteristics, demarcation, method, planning regions of India with special reference to North-East; Surveys for planning-Concept and functions; Types of surveys- Regional surveys, Diagnostic surveys, Techno-Economic surveys; Role of Remote Sensing, GPS and GIS.

Notes: *Seminar and Group discussion may be incorporated during class hour. Home assignment-Regional Planning in Developed world, Regional Planning in Less developed world, development controls and building byelaws in India, Importance of administrative boundary in regional planning, indicators of development (Compulsory any FOUR).*

References:

1. Bhalla A. S., 1992: *Uneven Development in the Third World: A Study of India and China*, Macmillan, London.
2. Dreze J. and Sen A., 1996: *Indian Development: Select Regional Perspectives*, Oxford University Press.
3. Misra R. P., Sundaram K. V. and Prakasa Rao V. L. S., 1974: *Regional Development Planning in India A New Strategy*, Vikas Publishing, Delhi.
4. Sundaram K. V., 1980: *Decentralised Multilevel Planning: Principles and Practices (Asian and African Experiences)*, Concept Publishing, Delhi.
5. Yugandhar, B. N. and Mukherjee, Amitava (eds.) 1991: *Readings in De-centralised Planning (with special reference to District Planning)*, 2 vols. Concept Pubs. Co., New Delhi.
6. Misra, R. P. & Misra, K. eds. 1998: *Million Cities of India*, Sustainable Development Foundation, New Delhi.
7. Myerson, D.L., 2004: *Involving the Community in Neighborhood Planning*, ULI Community Catalyst Report, USA.
8. A Guide for developing Neighbourhood Plans, 2002, Planning and Land Use Division, Winnipeg.
9. Chandana, R.C. 2002: *Regional Planning-A Comprehensive Text*, Kalyani Publishers, New Delhi
10. Chandana, R.C. 2016: *Regional Planning and Development*, Kalyani Publishers, New Delhi, 5th Edition
11. Chand, M. and Puri, V. K. 2001: *Regional Planning in India*, Allied Publishers Ltd, New Delhi

MGE 304B: Hazards and Disaster Management: Basic Concepts

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objectives: *To provide indepth knowledge on various types natural, hydro-meteorological and human induced disasters.*

Course learning outcomes

1. Students will understand the concepts related to hazard and disaster.
2. Students will know disaster phenomena and events at global, national and regional levels.
3. Students will know mechanism, causes and consequences of different geological hazards.
4. Mechanism, causes and consequences of hydro-meteorological hazards will be understood.
5. At the end of the course students will know the contribution of human activities to the cause of various disasters.

UNIT I: Understanding Hazard and Disaster

(15 hrs)

- a) Definitions and concepts of Hazard, Risk, Vulnerability, Capacity and Disaster
- b) Types, causes and effects of Hazards; Difference between Hazard and Disaster
- c) Different stages involved in Disaster

- d) Disaster phenomena and events (*Global, national and regional*)
- e) Disaster Management Cycle.

UNIT-II: Introduction to Geological Hazards and Disasters:

(15 hrs)

Causes and Consequences of

- a) Earthquakes
- b) Volcanic Eruption
- c) Landslides
- d) Tsunamis
- e) Mine fire

UNIT-III: Introduction to Hydro-Meteorological Hazards and Disasters:

(15 hrs)

Causes and Consequences of

- a) Floods
- b) Droughts
- c) Snow falls
- d) Cloudburst
- e) Cyclones
- f) Tsunamis

UNIT-IV: Introduction to Man Made Hazards and Disasters

(15 hrs)

- a) Understanding Man-Made Disasters
- b) Fires and Forest Fires
- c) Nuclear, Biological, Industrial and Chemical disasters
- d) Accident related disasters
- e) Occupational Hazards

Notes: *Seminar and Group discussion may be incorporated during class hour. Home assignment- Hazard-Risk-Vulnerability, Disaster phenomena and events, Disaster Management Cycle, Earthquakes, Landslides, Floods, Droughts, Fires and Forest Fires, Nuclear, Biological, Industrial and Chemical disasters, Accident related disasters (Compulsory any FOUR).*

Suggested Readings:

1. Bryant Edwards (2005): *Natural Hazards*, Cambridge University Press, U.K.
2. Carter, W. Nick, 1991: *Disaster Management*, Asian Development Bank, Manila.
3. Central Water Commission, 1987, *Flood Atlas of India*, CWC, New Delhi.
4. Central Water Commission, 1989, *Manual of Flood Forecasting*, New Delhi.
5. Government of India, 1997, *Vulnerability Atlas of India*, New Delhi.
6. Sahni, Pardeep et.al. (eds.) 2002, *Disaster Mitigation Experiences and Reflections*, Prentice Hall of India, New Delhi.

MGE 304C: Geoinformatics: Principles and Techniques of Remote Sensing



Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit: 04
Total Hours: 60
Total marks: 20 marks - 20 objective type questions (*from all units*)
50 marks – Set of 08 descriptive type questions of 10 marks (*Two from each unit*)

Objective: To understand the principles and techniques of Remote Sensing and to develop competency in data processing and analysis by using the science and technology of geoinformatics.

Course learning outcomes

1. Students will understand the principles and techniques of Remote Sensing.
2. Students will know Digital Image Processing techniques.
3. Students will know Digital Image classification techniques.
4. Students will know post classification analysis.
5. At the end of the course students will know the various areas and application of remote sensing tools in solving environmental issues and crisis.

UNIT - I: Principles and Techniques of Remote Sensing (18 hrs)

Principles of remote sensing, Energy radiation processes, Remote Sensing platforms - Geosynchronous and Sun synchronous satellites, Spectral reflectance based on characteristics of earth surface (rocks, soils, vegetation, water); Remote Sensing data characteristics - Spectral resolution, radiometric resolution, spatial resolution and temporal resolution; Principles of thermal, hyper spectral and microwave remote sensing and Basic idea on Synthetic Aperture Radar (SAR) data.

UNIT - II: Digital Image Processing: Data Preparation (15 hrs)

Data sources and characteristics of data, Geometric and radiometric correction of Remote Sensing digital data; Image segmentation (point, line, edge and combined detection), subsetting; resampling techniques; Image enhancement: Spatial domain methods and frequency domain methods.

UNIT - III: Digital Image Classification Techniques (15 hrs)

Elements of image analysis - low, intermediate and high level processing; Image supervised classifiers - Maximum Likelihood, Minimum distance, Minimum Mahalanobis distance, Spectral angle; Theoretical framework of unsupervised classification/ ISODATA classification, Clustering by K-means, Intelligent classifiers.

UNIT IV: Image Post Classification Analysis (12 hrs)

Ground truth collection by GPS or Spectrometer, Computation and interpretation of error matrix / confusion matrix, Kappa and Lambda coefficients for accuracy assessment; Change detection analysis, Advantages and disadvantages of classification techniques, Presentation of classification reports.

Essential Books:

1. Kumar, Meenakshi *Remote Sensing*, NCERT.
2. Guha, P.K. 2013: *Remote Sensing for the Beginner*, Affiliate East West Publishers, New Delhi.
3. Yavav, R. S. 1997: *Remote sensing in Land Evaluation*: Rajesh Publications, New Delhi.
4. Agarwal, N. K. 2004: *Essentials of GPS*, Spatial Networks Pvt. Ltd., Hyderabad.
5. Curran, Paul J., 1985: *Principles of Remote Sensing*, Longman, London & New York
6. Gupta, R. P., (2003): *Remote Sensing Geology*, Springer-Verlag.
7. Jensen, J.R., 2011: *Introductory Digital Image Processing: A Remote Sensing Perspective*, New Jersey: Prentice-Hall.
8. Lillesand, T. M. and Kiefer R. W, 2011: *Remote Sensing and Image Interpretation* – (6th Ed.), Wiley.
9. Joseph, G. 2005: *Introduction to Remote Sensing*, Universities Press (India) Pvt. Ltd, Hyderabad.
10. Rampal, K K, 1993: *Handbook of Aerial photography and Interpretation*, Concept Publication. Comp., New Delhi.

Note: Seminar and Group Discussion may be incorporated during class hour. Home assignments - Drawing of Electromagnetic spectrum, List of Remote Sensing data products with specifications by satellite, Scale of aerial photograph, Image classification steps, Georeferencing and digitization flow charting, Data structures, Map Design and layout format, Thematic mapping steps (compulsory - any four).

MGE305: Geoinformatics (General) Practical

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total marks: 02 questions of 15 marks each – 30 marks

02 questions of 10 marks each – 20 marks

Practical book – 10 marks Viva voce – 10 marks

Objective: To understand the practical knowledge of Remote Sensing, GIS and GPS and to develop competency in data processing and analysis by using the science and technology of geoinformatics.

Course learning outcomes

1. Students will understand the practical knowledge of geospatial technology.
2. Students will learn to develop competency in data processing.
3. Students will learn analysis by preparing maps and graphs.
4. Students will learn to apply remote sensing techniques.
5. At the end of the course understanding of GIS & its relationship to mapping software development will be easy.

UNIT - I: Remote Sensing

- (a) Georeferencing of satellite images based on a georeferenced map (1 exercise)
- (b) Stacking of images (Image composition) with various spectral bands (1 exercise)
- (c) Mosaicking of image and clipping the same or any other image by vector polygon boundary (1 exercise)
- (d) Image manipulation / enhancements and interpretation and feature identification (1 exercise)
- (e) Computation of image histogram and statistics (1 exercise)
- (f) Classification- Visually interpreted by vector polygons, Supervised and Unsupervised (3 exercises)

UNIT - II: Aerial Photograph Interpretation.

- (a) Geometry of aerial photographs.
- (b) Photo interpretation and feature identification based on interpretation keys.
- (c) Computation of photo coordinates

UNIT - III: Geographical Information System

- (a) Scanning / digitization of maps of different themes.
- (b) Georeferencing of scanned maps with geographic coordinate system and earth model and its datum (1 exercise)
- (c) Projection system and Coordinate transformation of the georeferenced map and its layout. (1 exercise)
- (d) Creation and editing of vector data layers of points, lines and polygons including adding attributes and designing map layout of the theme(s). (1 exercise)
- (e) Preparation of thematic maps from points (Population distribution by pie-chart, sphere) and map layout of the theme. (2 exercises)
- (f) Digitization of drainages and drainage ordering and creation of map layout. (1 exercise)
- (g) Digitization of different types of roads and the railways and creation of map layout (1 exercise)
- (h) Polygon based thematic map (District level literacy / population density map of any state) (1 exercise)

UNIT - IV: Global Positioning System

- (a) GPS/DGPS data collection of waypoints (Utility locations Bank, Hospitals, Shopping centres etc) and map layout (1 exercise)
- (b) GPS/DGPS data collection of routes and mapping thereon (1 exercise)

(c) GPS / DGPS data collection of land use features and mapping (1 exercise)

Field work: The field study is fundamental to the study of geography- it makes the subject come alive, promotes enthusiasm for geography and motivates students. Fieldwork is the means by which students can engage and develop a deep understanding of geographical processes and enquiry.

It is compulsory for all students, those who will not take will not given any marks for this. The students are to be sensitized about pre field work preparation, conduct field work, post field work exercises and report writing. Field study tour to provide traverses across and macro regions of the country specially problem areas, new geographical regions. It should be arranged of about two week duration. Student will be trained in field work like collection of data, mapping data/information etc. in which minimum 5 maps (Location map, Route map, Physical, Socio-economic and Cultural diagrams and 40 pages of write up is necessary).

Field Study Guide (Teacher)- Will submit a precise report (at least 5 pages) of field study work about the detail plan of field study, justification of selection of the area/region, day wise field study plan with the list of students present/attended the field study to the HoD Concern.

Note: Each and every exercise and assignment should contain the Date of Assignment and Date of Submission written on appropriate location of the exercise sheet, which is to be duly signed by concerned teacher on or before the date of submission. There should not be more than 7 days between these two dates for each exercise to be completed on regular basis by the student maintaining a standard practical note book. The student can appear for the sessional or end semester examination on practical by submitting completed assigned exercises only.

References:

1. Date, C.J., 1995 : *An Introduction to Data Base System*, 6th edition, Reading Massachusetts; Addison-Werley.
2. Fraser Taylor, D.R., (ed.), 1980 : *Progress in Contemporary Cartography*, John Wiley, Chichester U.K.
3. Fraser Taylor, D.R., (ed.), 1983 : *Graphic Communication and Design in Contemporary Cartography*, John Wiley & Sons Ltd. New York.
4. Jones, C., 1997 : *Geographic Information Systems and Computer Cartography*, Longman, London.
5. Kraak, M-J., and Ormeling, F., 2004: *Cartography: Visualization of Geospatial Data*, Pearson Education.
6. Misra, R.P., et al 2014: *Fundamentals of Cartography*, Concept Publishers, Delhi.

MGE 306: Northeast India: Land, People and Culture

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: To understand the biogeography, climate, agriculture, ethnicity, linguistics, economy, politics and cultural diversity of Northeast Region of India

Course learning outcomes

1. Students will understand the biogeography, climate, agriculture, ethnicity, linguistics, economy and politics of Northeast Region of India.
2. Students will understand cultural diversity of Northeast Region of India.
3. The course will also make students know the speciality and uniqueness of the NE region.
4. Students will know industries and transportation of NE India
5. At the end of the course students will understand and have knowledge on the different environmental related problems prevailed in the region.

UNIT I: North East India: Introduction to Physical Basis

Location and significance of North East Region of India; Physiography, Climate, Soil and Vegetation of NE Region; Biodiversity of NE Region; factors affecting biogeography of NE Region.

UNIT II: Population of North East India

(15 hrs)

Population characteristics: Peopling; Growth; Distribution and Density; Age and Sex composition; Rural–Urban composition and Religious composition; Ethnicity; Eco-Anthropology of the NE Region.

UNIT III: Agriculture of North East India

(15 hrs)

Agricultural development and economy of North East India; Agro-climatic regions of NE Region; Agricultural practices and modernization of agriculture in NE Region; Major agricultural crops cultivated in NE Region.

UNIT IV: Industries and Transportation of North East India

(15 hrs)

Industrial development and economy of North East India; distribution and production pattern of major Industries (Oil, Coal, Handloom and textile, Cottage industry, Agro-based industry, Food processing industry, Petrochemicals, Sugar, Paper and Cement industries, Tourism industry, Power industries), Transportation in NE Region: Roadways, Railways, Waterways, Airways, and Pipelines.

Note: Seminar and Group discussion may be incorporated during class hour.

References:

1. Govt. of India: India-Reference Annual, 2001 Pub. Div., New Delhi.
2. Govt. of India: National Atlas of India NATMO Publication, Calcutta.
3. Govt. of India: The Gazetteer of India. Vol. I & III Publication Division.
4. Learmonth A.T.A *et.al* (etd.) Man and land of South Asia, Concept;
5. Shafi, M. 2000: Geography of South Asia, McMillan & Co., Calcutta.
6. Discovery of North East India - Geography, History, Culture, Religion, Politics, Sociology, Science, Education and Economy (11 Volumes) Mittal Publications.
7. Dikshit, K. R.*et.al*. 2014:North-East India: Land, People and Economy, Advances in Asian Human-Environmental Research, Springer Science+ Business Median Dordrecht

SEMESTER - IV

MGE 401: Geography of Economic Activities

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: To deal with the spatial pattern in economic geography in terms of resources, agriculture industry and transport.

Course learning outcomes

1. Students will understand the scope and approaches in economic geography
2. Students will learn about models of agricultural systems.
3. Will come to know classification of industries and also different industrial approaches.
4. It will make students aware about different transportation model.
5. At the end of the course students will understand models of economic geography.

UNIT - I: Economic Geography

(15 hrs)

Meaning and scope, Approaches in economic geography: regional, systematic and sectoral; Concept of resources and resource classification; natural and human resources, renewable and non-renewable resources, biotic and abiotic resources; conservation of resources. Distribution and production of resources in global context: Forests, Coal, Iron ore, Water

UNIT - II: Approaches and Models of Agricultural Systems

(18 hrs)

Nature, scope and significance of Agricultural geography; Approaches: commodity, systematic, regional and ecological; Determinants of agricultural development: physical, technological, institutional; World agricultural systems. Agricultural location models: Von Thunen and Lösch; Cropping patterns and their measurements: crop concentration, crop diversification, crop combinations, measurement of agricultural efficiency, agricultural productivity; Green revolution and its effects on economy, society and environment; Problems and prospects of Indian agriculture.

UNIT - III: Industrial Geography

(15 hrs)

Classification and types of industries; Localisation factors; Weber's and Losch's approaches; Process and Pattern of Industrialisation; Resource based and foot-loose industries

UNIT - IV: Geography of Transport

(12 hrs)

Models of transportation and transport cost; Accessibility and connectivity: Inter-regional and Intra-regional; comparative cost advantage

Note: Seminar and Group discussion may be incorporated during class hour.

References:

1. Guha, J.L. and Chatteraj, P.R.: *A New Approach to Economic Geography*, The World Press Pvt. Ltd., Kolkata.
2. Alexander, J.W.: *Economic Geography*, Prentice Hall.
3. Leong, G.C. and Morgan, G.C.: *Human and Economic Geography*, Oxford University Press
4. Roy, P. and Mukherjee, S.: *Economic Geography – An Appraisal of Resources*, Central Educational Enterprise, Kolkata.

5. Thoman, R.S. and Corbin, P.B.: *The Geography of Economic Activity*, McGraw Hill
6. Negi, B.S.: *Geography of Resources*, Kitab Mahal, Delhi
7. Chauhan, D. 2010. *Agricultural Geography*, Ritu Publications
8. Brown, L.R. 1990 *The Changing World Food Prospects- The Nineties and Beyond*, World Watch Institute, Washington D.C.
9. Dyson, T. 1996. *Population and Food – Global Trends and Future Prospects*, Routledge, London.
10. Hussain Majid. *Agricultural Geography*, Concept Publication.
11. Gregory, H. F. 1970. *Geography of Agriculture*; Prentice Hall Englewood Cliff; New Jersey.

MGE 402A: Regional Planning: Practices in India and Selected Countries

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total Hours: 60

Total marks: 20 marks - 20 objective type questions (*from all units*)
50 marks – Set of 08 descriptive type questions of 10 marks (*Two from each unit*)

Objective: The objective of this paper is to give students an idea about the Methodology and strategies of regional planning with special reference to India.

Course learning outcomes

1. Students will understand about the different planning process in India.
2. Students will be aware about different problems of regional planning in India.
3. Students will come to know about different resource planning and management process in India.
4. Students will be aware about different planning process of developed country like USA.
5. At the end of the course students will aware about different prospects of regional planning in India.

UNIT - I: Process of Planning and Development in India

(15 hrs)

Process and types of planning, levels of planning, 73rd constitutional Amendment Act, 1992; Decentralized planning in India; Need for Regional planning, Importance of administrative boundary in regional planning; Concept of regional development, indicators of development;

UNIT - II: Problems and Prospects of Regional Planning in India

(15 hrs)

Regional Inequality, Regional Disparity and Regional Diversity in India; Regional Approach to Planning in India's Five Year Plans; Experience of Regional Planning in India: Multi-Level Planning (State, District and Block Level Planning), Regions for Planning (identification, characteristics, problems and policies)

UNIT - III: Resource Planning and Management in India

(15 hrs)

Techno-centric and Eco-centric Planning of Resources, Land Crisis for Development and SEZ, Development and Displacement and Rehabilitation; Human Resource Development: Employment Opportunity and Capability Building.

UNIT - IV: Case studies from selected countries

(15 hrs)

Case Studies of:

- a. Regional Planning in USA (TVA)
- b. Regional Planning in Netherlands (Polders)
- c. Regional Planning in Israel (Jazrael Valley)
- d. Regional Planning in UK (Lancashire)
- e. Regional Planning in Irrawaddy Valley (Myanmar)
- f. Regional Planning in Singapore

- g. River Valley Development Plan: Damodar Valley and Tribal Area Development Plan (North-East
- h. Hill Area Development Plan: Western Ghats, Himalaya, North-East India
- i. Metropolitan Regional Plan: National Capital Region, Guwahati Metropolitan Region



Notes: *Seminar and Group discussion may be incorporated during class hour. Home assignment- Guwahati Metropolitan Region, Human Resource Development, India's Five Year Plans, Regional Planning in Singapore, Hill Area Development Plan, Regions for Planning (Compulsory any four).*

References

1. Bhat, L.S., 1976: *Micro Level Planning in India*, K.B. Pub. New Delhi.
2. Misra R. P. (ed), 1980: *Regional Planning Concepts, Techniques, Policies and Case Studies*, Vikas Publishing, Delhi.
3. Sharma H. S and Chattopadhyaya S., 1998: *Sustainable Development: Issues and Case Studies*, Concept Publishing, Delhi
4. Chandana, R.C. 2002: *Regional Planning-A Comprehensive Text*, Kalyani Publishers, New Delhi
5. Chandana, R.C. 2016: *Regional Planning and Development*, Kalyani Publishers, New Delhi, 5th Edition

MGE 402B: Hazards and Disaster Management: Preparedness and Mitigation

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objectives: *To understand the techniques and tools for preparedness, mitigation and overall management of various disasters*

Course learning outcomes

1. Students will learn about various types of natural and human induced disasters.
2. Students can understand different tools and techniques for disaster preparedness and mitigation.
3. Role of government and NGOs will be understood
4. Technologies for disaster management will be known.
5. At the end of the course information on various governmental and non-governmental organisations working on disaster management field.

UNIT-I: Introduction to Disaster Preparedness (15 hrs)

- a. Disaster Management: Prevention, Preparedness and Mitigation
- b. Disaster Preparedness: Concept & Nature
- c. Disaster Preparedness Plan
- d. Disaster Preparedness for People and Infrastructure
- e. Vulnerability-Women, Children and Old age people and economically poor people
- f. Community based Disaster Preparedness Plan

UNIT-II: Roles & Responsibilities of Different Agencies and Government (15 hrs)

- a. Roll of Information, Education, Communication & Training
- b. Role and Responsibilities of Central, State, District and local administration
- c. Role and Responsibilities of Armed Forces, Police, Para Military Forces
- d. Role and Responsibilities of International Agencies, NGO's, Community Based Organizations (CBO's)

UNIT-III: Technologies for Disaster Management

- Role of IT in Disaster Preparedness
- Remote Sensing, GIS and GPS
- Use and Application of Emerging Technologies
- Application of Modern Technologies for the Emergency communication.
- Application and use of ICST for different disasters.

UNIT-IV: Disaster Mitigation

(15 hrs)

- Disaster Mitigation: meaning and concept
- Disaster Mitigation Strategies
- Emerging Trends in Disaster Mitigation
- Crises Management
- Mitigation management
- Role of Team and Coordination

Notes: Seminar and Group discussion may be incorporated during class hour. Home assignment- Disaster Management-Prevention, Preparedness and Mitigation, Disaster Preparedness Plan, Vulnerability-Women, Children and Old age people, Role of Education, Information, Training, Remote sensing, GIS and GPS, disaster mitigation, crises management (Compulsory any FOUR).

Suggested Readings:

- Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
- Roy, P.S. (2000): Space Technology for Disaster management: A Remote Sensing & GIS Perspective, Indian Institute of Remote Sensing (NRSA) Dehradun.
- Sharma, R.K. & Sharma, G. (2005) (ed) Natural Disaster, APH Publishing Corporation, New Delhi.

MGE 402C: Geoinformatics: Principles and Techniques of GIS

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total Hours: 60

Total marks: 20 marks - 20 objective type questions (*from all units*)
50 marks – Set of 08 descriptive type questions of 10 marks (*Two from each unit*)

Objective: To appraise the benefits of geoinformatics in geographical studies and provide direction to take up research on thrust areas by understanding and using the science and technology of geoinformatics.

Course learning outcomes

- Students will understand about the various principles of GIS.
- Students will learn fundamentals of Geodasy.
- Data management in Geoinformatics will be understood
- Students can understand the benefits of geoinformatics tools in environmental studies.
- At the end of the course students will be provided direction to take up research on thrust areas.

UNIT - I: Fundamentals of Geodesy

(15 hrs)

Fundamentals of geodesy: Shape and size of the earth, Geoid, Ellipsoids and their flattening, Geodetic datum, Geodetic coordinate System, Map Projection System, Errors in GIS, Vector data editing tools and concept of tolerance- weeding and snapping, merging, combining, splitting and clipping; Errors in GIS,

UNIT - II: Database Management in Geoinformatics

Concept of Database Management System (DBMS), Relational Database Management System (RDBMS), Geodatabase and data models in GIS. Attribute data processing and management; DEM data sources and the characteristics of data - SRTM, GTOPO, GLOBE, LiDAR, CARTOSAT DEM; GPS/DGPS data management and mapping- technical issues

UNIT - III: Principles and Techniques of GIS

(15 hrs)

Topological relationships of vector data and network analysis, Spatial interpolation techniques - types, uses and problems; Uses of Digital elevation/terrain / surface model (DEM /DTM/ DSM) and Triangulated Irregular Networks (TIN) model.

UNIT - IV: Spatial Modeling and Analysis

(15 hrs)

Concept of spatial modeling and analysis, Spatial autocorrelation; Geographically Weighted Regression; Spatial decision support by raster overlay analysis, Geoprocessing functions and tools- buffering, union and intersection; Web-GIS.

Note: Seminar and Group Discussion may be incorporated during class hour. Home assignments - Drawing of Electromagnetic spectrum, List of Remote Sensing data products with specifications by satellite, Scale of aerial photograph, Image classification steps, Georeferencing and digitization flow charting, Data structures, Map Design and layout format, Thematic mapping steps (compulsory - any four).

Essential Books:

1. Martin, D. 1995: *Geographic Information Systems Socioeconomic Applications*, Routledge
2. Heywood, Ian, Cornelius, S. 2011 : *An Introduction to GIS 4th Edition*, Pearson, New Delhi
3. Chang, Kang-tsung , 2008: *Introduction to Geographic Information System* – (4th Ed.), Tata McGraw-Hill.
4. DeMers, M. N. 2000: *Fundamentals of Geographic Information Systems* : , John Willey, New York.
5. Longley, P. A M. Goodchild, M., D. J. Maguire, D. J. And Rhind, D. W. 2001: *Geographic Information Systems and Science* , John Willey, New York
6. Burrough, P. A. 1998: *Geographical Information for Land Resource Assessment* , Oxford.
7. Agarwal, N. K. 2004: *Essentials of GPS* , Spatial Networks Pvt. Ltd., Hyderabad.
8. Gopi, S. 2005: *Global Positioning System Principles and Applications*, Tata McGraw Hill, New Delhi

MGE 403A: Regional Planning: Rural and Urban Development Planning in India

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)

Total Credit: 04

Total Hours: 60

Total marks: 20 marks - 20 objective type questions (*from all units*)

50 marks – Set of 08 descriptive type questions of 10 marks (*Two from each unit*)

Objective: The objective of this paper is to give students an idea about urban planning strategies with special reference to India.

Course learning outcomes

1. Students will learn about rural development in developed and developing countries.
2. Students will know about the concept of Economic liberalization and regional disparities in India and NE India.
3. Students will get the idea about the fundamentals of urban development planning.
4. Students will be aware about urban development in North East India
5. At the end of the course students will aware about urban development and associated problems in North East India

UNIT I: Rural Development Planning

(15 hrs)

Rural development in developed, developing and under developing countries. Administrative planning for rural development. Integrated rural Development: Concept, issues and challenges, Approaches to integrated rural development, issues in rural industrialization, utilization of surplus labor, time and technology. Role of Cooperative sector. Role of agriculture in rural development in Israel and India. District Level Planning-Lessons and experience. Role of Self Help Groups (SHGs), Role of Micro Finance in rural development.

UNIT II: Economic Liberalization and Regional Disparities in India and NE India (15 hrs)

Economic Liberalization-Concept and issues, India Economy- Pre and Post Economic Liberalization Period, National and Regional Growth in Indian Economy. Regional disparities in India, resource distribution and development in India, Levels of Development in NE India-Industrial sector, agricultural sector, marketing system. Unemployment in NE India-some issues, Look east policy-its impact on rural development in NE India.

UNIT III: Fundamentals of Urban Development Planning (15 hrs)

Evolution of human settlements in modern context. Understanding of different types of urban infrastructures in planning, layout of service lines and interface. Physical nature and characteristics of the urban environment and its components; Land uses, physical structure and relationship between parts of city. Approaches to urban redevelopment, Urban Renewal. Urban reconstruction, urban rejuvenation. Alternative Approaches for Delivery of Basic Services to the Urban Poor, Community planning approach, low cost alternatives and institutional reforms approach.

UNIT IV: Urban Development and Associated Problems in North East India (15 hrs)

The fundamental problems of the city; changes with time and growth; technological, social and other changes in size and scale Multi-nuclei developments: Inter-city issues and problems, Alternative strategies to metropolitan growth - planning for New towns: types, design criteria, development process and issues. New town approach in North East India: small and medium town development. Urban Growth Management.

Notes: Seminar and Group discussion may be incorporated during class hour. Home assignment-issues in rural industrialization, Role of Self Help Groups (SHGs), Role of Micro Finance in rural development, Look east policy-its impact on rural development in NE India, Regional disparities in India, Evolution of human settlements in modern context, New town approach in India: small and medium town development (Compulsory any FOUR).

References:

1. Misra, R. P. (ed), 1980: *Regional Planning Concepts, Techniques, Policies and Case Studies*, Vikas Publishing, Delhi.
2. Horelli, E. (ed), 2013: *New Approaches to Urban Planning*, Aalto Universities Publication Series, Finland.
3. Riddell, R. ,2004: *Sustainable Urban Planning*, Blackwell Publishing.
4. Hall, P. 1992: *Urban and Regional Planning*, Routledge, London
5. Singh, S. and Chetry, P. 2016: *Agricultural Growth, Productivity and Regional Change in India: Challenges of globalisation, liberalisation and food insecurity*, Routledge, London
6. Bhalla, G. S. and Singh, G. 2012: *Economic Liberalisation and Indian Agriculture: A District-Level Study*, Sage Publications India PVT Ltd, New Delhi (1st Edition)
7. Nayyar, D. 2012: *Liberalization and Development* Oxford University Press, London 1st edition
8. Sahu, B. K. 2003: *Rural Development in India*, Anmol Publisher, New Delhi
9. Lakshman, T. K. and Narayan, B. K. (eds). 1987. *Regional Development in India: A Multi Dimensional Analysis*, Himalayan Publishing House, New Delhi
10. Mahapatra, A. C. and Pathak, C. R. (eds). 2003. *Economic Liberalisation and Regional Disparities in India-A Focus on North Eastern Region*, Star Publishing House, Shillong

MGE 403B: Hazards and Disaster Management: Issues and Policies

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objectives: *To provide depth knowledge on various types of rehabilitation, reconstruction, different policies of disaster management and local knowledge through various case studies on disasters.*

Course learning outcomes

1. Students will understand about various issues related to natural hazards
2. Students will learn man-made hazards and disaster in India.
3. Students will learn different policies framed for disaster management.
4. Students will learn various strategies adopted for disaster management.
5. At the end of the course students will get knowledge of different disasters occurred locally and globally.

UNIT I: Rehabilitation, Reconstruction and Recovery

(15hrs)

- a) Recovery aspects- long term and short term
- b) Physical and social infrastructure
- c) Relocation and reconstruction of structural and non-structural components,
- d) Social and economic rehabilitation
- e) Capacity building and skill enhancement for livelihood development,
- f) Training and awareness programmes
- g) Medical aid therapy and counselling
- h) Agricultural aids
- i) Repair and retrofitting
- j) Role of Micro finance in disaster management

UNIT II: Policies for Disaster Management

(15 hrs)

- a) Yokohama Declaration
- b) International Decade for Natural Disaster Reduction (IDNDR)
- c) Hyogo framework
- d) United Nations International Strategy for Disaster Reduction (UNISDR)
- e) Global Facility for Disaster Risk Reduction (GFDRR)
- f) Disaster prevention through Sustainable development
- g) Community participation

UNIT III: Case studies of major Hazards and Disasters in India and the Globe (*in the last and present century*)

(15 hrs)

- a) Earthquakes
- b) Landslides
- c) Tsunamis
- d) Snow Falls
- e) Floods
- f) Droughts
- g) Cyclones
- h) Tsunamis
- i) Nuclear, Biological, Industrial and Chemical disaster
- j) Road Accidents

UNIT IV: Causes, Consequences, Mitigation/Management of Hazards and Disasters in North East India (15 hrs)

- a) Earthquake
- b) Floods and Flash Floods
- c) Landslides
- d) Droughts
- e) Accident related disasters

Notes: Seminar and Group discussion may be incorporated during class hour. Home assignment- Rehabilitation, recovery, reconstruction, Physical and social infrastructure, Training and awareness programmes, Medical aid therapy and counselling, Yokohama Declaration, IDNDR, UNISDR, Assam Earthquake-1950, Flood in Assam (Compulsory any FOUR).

Suggested Readings:

1. Carter, W.N. (1992): *Disaster Management: A Disaster Manager's Handbook*, Asian Development Bank, Manila.
2. *Disaster Management (108)*: Books Prescribed by IGNOU
3. Goel, S.L. (2006): *Encyclopaedia on Disaster Management: Disaster Management Policy and Administration*, Deep & Deep Publications Pvt. Ltd. New Delhi.
4. Hulme, David and Paul Mosley, "*Finance against Poverty*", Rout ledge London, 1996.
5. Kapur. Anu & Neeti, Meeta, Deeptiman, Roshani & Debanjali (2005): *Disasters in India Studies of Grim Reality*, Rawat Publications, New Delhi.
6. Kapur. Anu, (2010): *Vulnerable India*, Sage publications, New Delhi.
7. Kumar. Arvind (2010): *Disaster Management Recent Approaches*. Anmol Publications Pvt. Ltd. New Delhi.
8. Mathur, G.C. (1986): *Housing in Disaster prone areas, National Building Organization and U.N. Regional Centre*. ESCAP, New Delhi.
9. Meyer, Richard L, "*Micro finance, Poverty alleviation and Improving Food Security: Implications for India*" in *Food Security and Environmental Quality*, CRC Pres LLC, Boca Raton, FL. 2002.
10. Mishra, P.K. *Transforming adversity into opportunity: experiences from Gujarat earthquake reconstruction program World congress on Natural disaster mitigation proceedings*, February 2004.
11. National Disaster Response Plan, NCDM, New Delhi, 2001.
12. Report of the High Powered Committee (HPC) on Disaster management, NCDM, New Delhi, 2001.

MGE 403C: Geoinformatics: Applications in Major Areas

Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: To appraise the benefits of geoinformatics in geographical studies and provide direction to research on thrust areas by understanding and using the science and technology of geoinformatics.

Course learning outcomes

1. Students will understand about geoinformatics for natural resources monitoring and management.
2. Students will get the idea about geoinformatics for environmental studies, hazards and disaster management.
3. Students will be aware about different geoinformatics application in planning and development.
4. Students will learn geoinformatics for drainage basin analysis.
5. At the end of the course students will understand about geoinformatics for hydrological analysis.

UNIT - I: Geoinformatics for Natural Resources Monitoring and Management (15 hrs)

Land use / Land cover (LU/LC) mapping: Introduction to Land use / Land cover: Definition and classification scheme (by USGS after Anderson and by NRSC at Level-1, Level-2 and Level-3), LU/LC interpretation keys for LANDSAT/IRS data, Resources mapping - water resources, soils, forests, minerals, agriculture etc.

UNIT - II: Geoinformatics for Environmental Studies, Hazards and Disaster Management (15 hrs)

Identification of flood prone area, landslide prone area, forest fire - data sources and dataset requirements, methodology charting and basic considerations, biodiversity, environmental pollution and climate change studies; Monitoring and warning systems of disastrous / hazardous events and mitigation plans.

UNIT - III: Application of Geoinformatics in Planning and Development (15 hrs)

Rural and urban infrastructure survey, mapping and planning - transportation, health, education and others; Urban sprawl and water logging mapping, Development strategy planning for flood and drought prone areas, hilly areas, Smart villages and smart cities.

UNIT - IV: Geoinformatics for Drainage Basin and Hydrological Analysis (15 hrs)

Drainage basin morphometry from maps and satellite data, basin hydrological studies, Geoinformatics based methodology for integrated approaches of basin development, Ground water potential studies; DEM generation and DEM based applications.

Note: Seminar and Group Discussion may be incorporated during class hour. Home assignments - Land use system India, Drawing of flow / activity charts - preparation of land use / land cover map, flood hazard zoning, development strategy planning, integrated basin development, biodiversity mapping, disaster warning system, smart village planning, groundwater potential estimation (Compulsory - any four).

Essential Books:

1. Agarwal, C. S and Garg, P. K. 2000: *Text book on Remote Sensing in Natural Resource Monitoring and Management* – A. H. Wheeler, New Delhi-1.
2. Guha, P.K. 2013: *Remote Sensing for the Beginner*, Affiliate East West Publishers, New Delhi.
3. Lillesand Thomas M, & Keifer, 1997: *Remote sensing & Image interpretation*, Wiley, New York
4. Gautam, N. C., Raghavswamy, V. And Nagaraja, R. (Chief Editor) 1994: *Space Technology and Geography*, NRSC, Hyderabad
5. Jensen, J. R. 2011: *Remote Sensing of the Environment – An Earth Resource Perspective*: Pearson Education., New Delhi.
6. Heywood, Ian, Cornelius, S. 2011 : *An Introduction to GIS 4th Edition*, Pearson, New Delhi
7. Yadav, R. S. 1997 : *Remote Sensing in Land Evaluation*: , Rajesh Publication, New Delhi.
8. Joseph, G. 2005: *Introduction to Remote Sensing*, Universities Press (India) Pvt. Ltd, Hyderabad.
9. *Academic Journals and Periodicals*

MGE 404A: Regional Planning (Practical)

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from Final Examination)

Total Credit: 4

Total marks: 20 marks - Viva (10 marks) + Practical Note Book (10 marks)

Objective: The objective of this paper is to make students familiar with different practical analysis and techniques of Regional Planning.

Course learning outcomes

1. Students will learn about different practical analysis in regionalisation methods.
2. Students will be aware about different parameters of network analysis.
3. Students will get idea about different crop combination methods.
4. Students will be aware about delimitation of influence areas of nodal centers.
5. At the end of the course understanding practicality of grass root planning techniques will be easy.

Unit - I: Regionalisation methods

- a) Overlapping of different themes
- b) Ranking using 'z' score
- c) Factor Analysis and Principal Component Analysis
- d) Ternary diagram

Unit - II: Network Analysis

- (A) Application of aggregate connectivity using:
- a) Road density(Dn)
 - b) Cyclometric number(μ)
 - c) Alpha Index(α)
 - d) Beta Index(β)
 - e) Gama Index(γ)
 - f) Eta Index(η)
 - g) Theta Index(θ)
 - h) Detour Index
- (B) Shape Index

Unit - III: Crop combination methods

- (1) Weaver's method
- (2) Nelson's method

Unit - IV: Delimitation of influence areas of nodal centers

- (1) Breaking point method
- (2) Gravity potential method

Note: Each and every exercise and assignment should contain the Date of Assignment and Date of Submission written on appropriate location of the exercise sheet, which is to be duly signed by concerned teacher on or before the date of submission. There should not be more than 7 days between these two dates for each exercise to be completed on regular basis by the student maintaining a standard practical note book. The student can appear for the sessional or end semester examination on practical by submitting completed assigned exercises only.

Internship/Field work: Students have to undergo internship under any government/non-government organization or field work for a period of minimum one month (30 days). On completion of internship/field work a report have to submit in the Department.

MGE 404B: Hazards and Disaster Management (Practical)

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from Final Examination)

Total Credit: 4

Total marks: 20 marks - Viva (10 marks) + Practical Note Book (10 marks)
50 marks – Set of 03 questions

Objective: The objective of this paper is to make students familiar with different practical analysis and techniques of Hazards and Disaster Management.

Course learning outcomes

1. Students will understand about practical analysis and techniques of hazard and disaster management.
2. Students will get knowledge on mapping of major crustal plates, earthquake zones
3. Mapping of flood and landslide hazard zones will be known
4. Understanding of risk mapping will be easy.
5. At the end of the course students will know what to do in emergency situation through mock-drill.
 1. Mapping of Major Crustal Plates of the Earth
 2. Diagrams showing relationship between earthquakes and plate margins
 3. Mapping of Earthquake Zones of India according to risk levels
 4. Mapping of Flood Hazard Regions of India/NE India using GIS
 5. Mapping of Landslide Hazard Regions of India/ NE India using GIS
 6. Prepare a brief report on Institutional survey on disaster preparedness and mitigation (hospitals / Schools).
 7. Methods of Risk Mapping.
 8. Mock drill.

Field Visit:

1. State Disaster Management Authority (SDMA) Assam.
2. Lokpriya Gopinath Bordoloi Regional Institute of Mental Health, Tezpur
3. Guwahati Psychiatric Hospital, Guwahati
4. Meghalaya Administrative Training Institute (MATI), Shillong.
5. Fire Safety Station, Dispur, Guwahati.

Note: Each and every exercise and assignment should contain the Date of Assignment and Date of Submission written on appropriate location of the exercise sheet, which is to be duly signed by concerned teacher on or before the date of submission. There should not be more than 7 days between these two dates for each exercise to be completed on regular basis by the student maintaining a standard practical note book. The student can appear for the sessional or end semester examination on practical by submitting completed assigned exercises only.

MGE 404 C: Geoinformatics (Practical)

Total Marks: 100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit: 04
Total marks: 20 marks - Viva (10 marks) + Practical Note Book (10 marks)
 50 marks – Set of 03 questions

Objective: To enhance capacity building in handling geoinformatics tools.

Course learning outcomes

1. Students will learn the handling of geo-informatics tools.
2. This will help in learning on how to collect data using GIS technology
3. This will provide knowledge on how to process data using GIS technology.
4. Students will learn geoinformatics tools and can utilize in their project work.
5. At the end of the course practical's using GPS will be known.

UNIT - I: Remote Sensing

- (a) Unsupervised classification and recoding of enhanced image and derivation of statistics (1 exercise)
- (b) Computation of NDVI from IRS-1C/1D/Resourcesat/ LANDSAT data (1 exercise)
- (c) Preparation of Land use / Land cover map of the same area for two different time periods and to perform change detection and accuracy assessment (1 exercise)

UNIT - II: Aerial Photograph Interpretation.

- (a) Stereoscopic visualisation of Air photograph and drawing geographic features.
- (b) Determination of scale, parallax and displacements from aerial photograph
- (c) Computation of distance between the two known points on aerial photograph.

UNIT - III: Geographical Information System

- (a) Digitization of contour features from a portion topographical map in projected system of coordinates and creation of TIN model with standard map layout. (1 exercise)
- (b) Creation of 2-D surface model from TIN model with standard map layout (1 exercise)
- (c) Generation slope from 2-D surface model. (1 exercise)
- (d) 3-D visualization of 2-D surface model with vertical enhancement (1 exercise)
- (e) Preparation of aspect map from slope and map layout of the theme. (1 exercises)
- (f) Drawing profiles from 2-D surface model (1 exercise)
- (g) Preparation of thematic map of Assam / Meghalaya or any N E state on 3 different themes (1 exercise)

UNIT - IV: Global Positioning System

- (a) GPS/DGPS data collection of few waypoints randomly from a variable terrain and preparation of a DEM and generation of contours (1 exercise)
- (b) GPS / DGPS data collection for preparation of land use map. (1 exercise)
- (c) Preparation of large scale map from scanned map (building plan / site plan etc.) (1 exercise)

Note: Each and every exercise and assignment should contain the Date of Assignment and Date of Submission written on appropriate location of the exercise sheet, which is to be duly signed by concerned teacher on or before the date of submission. There should not be more than 7 days between these two dates for each exercise to be completed on regular basis by the student maintaining a standard practical note book. The student can appear for the sessional or end semester examination on practical by submitting completed assigned exercises only.

References:

1. Jensen, J. R., 2011: *Introductory Digital Image Processing: A Remote Sensing Perspective*, New Jersey: Prentice-Hall.
2. Rampal, K K, 1993: *Handbook of Aerial photography and Interpretation*, Concept Publication Comp., New Delhi.
3. Gonzalez, R. C. and Woods, R. E., 2000: *Digital Image Processing*, Addison-Wesley, Singapore.
4. Lillesand, T. M. and Kiefer R. W, 2011: *Remote Sensing and Image Interpretation* – (6th Ed.), Wiley. New York
5. DeMers, M. N. 2000: *Fundamentals of Geographic Information Systems* : , John Willey, New York.
6. Longley, P. A M. Goodchild, M., D. J. Maguire, D. J. And Rhind, D. W. 2001: *Geographic Information Systems and Science* , John Willey, New York
7. Fraser Taylor, D.R., (ed.), 1980 : *Progress in Contemporary Cartography*, John Wiley, Chichester U.K.
8. Fraser Taylor, D.R., (ed.), 1983 : *Graphic Communication and Design in Contemporary Cartography*, John Wiley & Sons Ltd. New York.
9. Jones, C., 1997 : *Geographic Information Systems and Computer Cartography*, Longman, London.
10. Kraak, M. J., and Ormeling, F., 2004: *Cartography: Visualization of Geospatial Data*, Pearson Education.
11. Agarwal, N. K. 2004: *Essentials of GPS* , Spatial Networks Pvt. Ltd., Hyderabad.
12. Gopi, S. 2005: *Global Positioning System Principles and Applications*, Tata McGraw Hill, New Delhi

MGE 405: Dissertation

Total Marks: 100 (70 marks from Internal Assessment + 30 marks from End Semester Examination)

Total Credit: 04

Dissertation works	Internal	External
(a) Progress Report (Presentation)	30 marks*	-----
(b) Pre-submission (Presentation)	40 marks*	-----
(c) End semester evaluation	-----	30*

[**Project work =10 marks, Presentation 10 marks and viva-voce 10 marks]

***Average of marking by all the faculties on the basis of student's performance**

Objectives:

1. Students will be given a topic related to their optional subject to prepare a dissertation .
2. Students are required to give viva-voce exam after the submission of dissertation.

Course learning outcomes

1. Students will learn to identify and design a research problem related to environment and ecology/ disaster management / socio-cultural issues/ urban planning /rural development/ regional planning.
2. It allows students to apply theoretical and practical knowledge to carry out a research work on a topic of physical and human geography.
3. This course will allow students to utilize various tools and techniques to analyse the research problem.
4. The course will impart training to students on how to present their research work and findings via power point presentation
5. At the end of the course students will learn presentation through dissertation and research papers.

The topic of dissertation will be taken from the view point of physical and human geography which will cover the problems and remedial aspect of the subject. The subject matter that will cover are environment and ecology, disaster management, socio-cultural issues, urban planning and rural development, regional planning, population, agriculture and settlement. The dissertation by the student will be made by using recent statistical and geo-informatics tools and techniques which will help student for a quality analysis and research.

Objectives:

1. Students are required to select a topic of their interest and prepare a dissertation .
2. Student need to submit a synopsis before the end semester for approval from the Supervisor in a specified format.
3. Students are required to give final presentation on objectives, methodology and findings of the study after the submission of dissertation.

MGE 406: Disaster Management



Total Marks:	100 (30 marks from Internal Assessment + 70 marks from End Semester Examination)
Total Credit:	04
Total Hours:	60
Total marks:	20 marks - 20 objective type questions (<i>from all units</i>) 50 marks – Set of 08 descriptive type questions of 10 marks (<i>Two from each unit</i>)

Objective: *To provide basic knowledge on various types natural and human induced disasters. To understand the techniques and tools for preparedness, mitigation and overall management of various disasters*

UNIT I: Understanding Hazards and Disaster

(15 hrs)

Hazard and Disaster; Natural and Human-induced disasters – Introduction, Conceptual framework; difference between Hazard and Disaster, different stages involved in Disaster; Disaster phenomena and events (*Global, national and regional*).

UNIT II: Environmental and Human Induced Disasters

(15 hrs)

Environmental disasters –Earthquake and associated impacts, Earthquake prediction, Structural damage and its prevention, Dams and earthquakes, Tsunami: Mechanism and Control; Coastal Disaster and management (CRZ); Flood and Drought – causes, impacts, precautions and mitigation, Landslide and River bank Erosion – Mechanism and Control.

Human induced disasters –Industrial and chemical disasters, road/air/rail accidents, fire incidents, epidemics, disease outbreaks, alcoholism and suicides, violence, occupational health hazards, poverty, urban slum, migration and refugees, conflict, terrorism. Adaptation Strategies.

UNIT III: Disaster Management and Disaster Mitigation

(15 hrs)

Concept of disaster management; International Decade for Natural Disaster Reduction (IDNDR), Hyogo framework, Disaster prevention through Sustainable development and community participation.

Concept of mitigation and preparedness, Institutional framework for disaster preparedness and mitigation- Global and Indian scenario, Training Need Analysis and Human Resource Development Plan, Family disaster plan, Applications of GIS and GPS in Disaster Mitigation.

UNITIV: Rehabilitation, Reconstruction and Recovery

(15 hrs)

Recovery aspects- long term and short term, Physical and social infrastructure: Relocation and reconstruction of structural and non-structural components, Social and economic rehabilitation: Capacity building and skill enhancement for livelihood development, training and awareness programmes, medical aid therapy and counselling, agricultural aids. Repair and retrofitting.

Note: *Seminar and Group Discussion may be incorporated during class hour.*

Essential books:

1. *Disaster Management: A Disaster Manager's Handbook*, Carter, W.N.(1992), Asian Development Bank, Manila.
2. *Encyclopaedia on Disaster Management: Disaster Management Policy and Administration*, S.L. Goel, (2006): Deep & Deep Publications Pvt. Ltd. New Delhi.
3. *Disaster Management Recent Approaches*. Arvind Kumar (2010): Anmol Publications Pvt. Ltd. New Delhi.
4. Kapur Anu and Neeti, Meeta, Deeptiman, Roshani and Debanjali (2005): *Disasters in India Studies of Grim Reality*, Rawat Publications, New Delhi.

Reference Books:

1. *Vulnerable India*, Anu Kapur (2010): Sage Publications, New Delhi.
2. *Housing in Disaster prone areas, National Building Organization and U.N. Regional Centre*. G.C Mathur, (1986), ESCAP, New Delhi.
3. *Transforming adversity into opportunity: experiences from Gujarat earthquake reconstruction program World congress on Natural disaster mitigation proceedings*, (2004) P. K. Mishra, February.
4. *Natural Hazards and Disasters Management-Vulnerability and Mitigation*, R.B. Singh.

Course Title: Human Values and Professional Ethics

Course Code: HVP-740

Nature of the Course: Theory

Non-Credit Compulsory Course

Course Description: The purpose of this course is to examine various ethical issues that may arise in one's professional life, and how such a life intersects one's personal life and self-understanding with the core focus to enlighten the students regarding value based approaches within a variety of context. The concept of value is understood in two different contexts; one is People's judgments about what is important or meaningful in their lives and the other is principles or standards for behavior, supported by religion, constitution and norms.

Course Objectives:

- 1) To critically understand ethical issues as they pertain to professional and personal identity.
- 2) To learn to consider oneself and the world around from these basic ethical positions.
- 3) To develop sharpened analytic powers and capacities for oral and written expression.

Unit-1: Ethics and Human Values

[8 Lectures]

Definition, Importance and Relevance in present-day Society.

Indian Constitutional Values: Fundamental Rights and Duties; Freedom, Equality, Fraternity, Justice; Directive Principles of State Policy.

Religious and Cultural Values: Values embedded in different religions; Religious Tolerance.

Unit-2: Basic Human Virtues

[8 Lectures]

Concept of Honesty, Punctuality, Responsibility, Courtesy, Discipline, Courage, Compassion, Empathy and Restrain

Family responsibilities: Duties as a Member of the Society, Guidance to youngsters; Gender Equality.

Social Concerns: Evils of Dowry & Caste System, Racial Discrimination, Suicidal Tendencies, Substance Abuse and Addiction.

Unit-3: Introduction to Professional Ethics

[8 Lectures]

Need, Importance and Goals; Ethical Values in Different Professions: Dignity of Labour, Respect for Authority, Code of Conduct, Conflicts of Interest.

Occupational Crime; Sexual and Mental Harassment in work place.

Professional Rights: Employee Rights, Intellectual Property Rights (IPR).

Unit-4: Ethics in Professional and Global Space

[5 Lectures]

Cyber Ethics and Etiquette.

Correct and Judicious use of Mobile Phones/electronic gadgets, Social Networking in professional space.

Environmental Ethics; Ethics in Research.

Suggested Readings:

- 1) Jayashree Suresh and B S Raghavan- *Human Values and Professional Ethics: Values and Ethics of Profession*. S Chand, 2005.
- 2) Martin, Clancy, Wayne Vaught, and Robert Solomon (eds.)- *Ethics Across the Professions: A Reader for Professional Ethics*. Oxford: Oxford University Press, 2010.
- 3) R.R. Gaur, R. Sangal and G.P. Bagaria- *A Foundation Course in Human Values and Professional Ethics* (Paperback). Excel Books, 2010
- 4) Terrence M. Kelly- *Professional Ethics: A Trust-Based Approach*. Lexington Books, 2018.
- 5) R. S. Naagarazan- *Professional Ethics and Human Values*. New Age International (Second ed.), 2019.

SYLLABUS

For

3 YEARS BACHELOR PROGRAMME

in

FOOD SCIENCE AND TECHNOLOGY

[As per the B. Sc. Food Science and Technology syllabus under LOCF system recommended by UGC]

Effective from Academic Session: 2021-22



School of Biological Sciences (SoBS)

UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

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Preamble

The objective of any programme at Higher Education Institute is to prepare their students for the society at large. The University of Science and Technology, Meghalaya envisions all its programmes in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. It imbibes a Learning Outcome-based Curriculum Framework (LOCF) for all its Under Graduate programmes.

The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The LOCF approach has been adopted to strengthen students' experiences as they engage themselves in the programme of their choice. The Under-Graduate Programmes will prepare the students for both, academia and employability.

Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the graduation level. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice and also skills for employability. In short, each programme prepares students for sustainability and life-long learning.

The new curriculum of B.Sc. Food Science and Technology offers the students to gain the requisite knowledge, skills and aptitude for the field of food science & technology. The efforts are made to measure cognitive as well as applied learning. Students are not only trained on the core components but also in areas which are need based, innovative and relevant keeping in pace with the fast growing food industry. The course is internationally competitive.

The University of Science and Technology Meghalaya hopes the LOCF approach of the programme B.Sc. Food Science and Technology will help students in making an informed decision regarding the goals that they wish to pursue in further education and life, at large.

1. Introduction to B.Sc. Food Science and Technology

The Food Science and Technology course at the Bachelors level is being run in the University of Science and Technology Meghalaya from 2015 and was introduced by the School of Biological Sciences from the academic year 2015-2016. The new course has been prepared keeping in view, the unique requirements of B.Sc. Food Science and Technology students. In the increasingly globalized society, it is important that the younger generation especially the students are equipped with knowledge, skills, mindsets and behaviors which may enable them to perform their duties in a manner so that they become important contributors to the development of the society. This will also help them to fully utilize their educational training for earning a decent living so that the overall standard of their families and surroundings improve leading to development of welfare human societies. To achieve this goal, it is imperative that their educational training is improved such that it incorporates the use of newer technologies, use of newer assessment tools for mid-course corrections to make sure that they become competitive individuals to shoulder newer social responsibilities and are capable of undertaking novel innovations in their areas of expertise. In the face of the developing knowledge society, they are well aware about the resources of self-development using on-line resources of learning which is going to be a major component of learning in the future. The learning should also be a continuous process so that the students are able to re-skill themselves so as to make themselves relevant to the changing needs of the society. In the face of this need, the educational curricula, teaching learning processes, training, assessment methods all need to be improved or even re-invented. The higher educational institutions (HEI) all over the globe are in the grip of this urgent task and India needs to keep pace with all these developments.

The objectives of the course are:

- To impart knowledge in areas related to Food Science and Technology.
- To enable the students to understand the food composition along with its physico- chemical, nutritional, microbiological and sensory aspects.
- To acquaint the students with the technologies of food processing and preservation of plant and animal foods; cereals, pulses, oilseeds, fruits vegetables, spices, meat, fish, poultry, sea food, milk and dairy products.
- To stress on the importance of food safety and quality management, national and international food laws and regulations as well as importance of food engineering and packaging in food industry.

The course contents have been so designed that it can keep pace with the rapidly growing food industry. Since, Food Science and Technology is an interdisciplinary science it is recommended that subjects like Biochemistry, Biology, Chemistry, Maths, Statistics, Biostatistics, Physics etc be preferably chosen as the Generic elective(GE) by the students as they are synergistic to the curriculum. However, students are free to pick up any of the Generic Elective Courses offered by other departments.

2. Learning Outcomes based approach to Curriculum Planning:

The learning outcomes-based curriculum framework is based on the premise that every student and graduate is unique. Each student or graduate has his/her own characteristics in terms of previous learning levels and experiences, life experiences, learning styles and approaches to future career related actions. The quality, depth and breadth of the learning experiences made available to the students while at the higher education institutions help develop their characteristic attributes.

2.1 Nature and extent of the B.Sc. Programme:

The undergraduate programme in Food Science & Technology is the first level of college or university degree in the country as in several other parts of the world. After obtaining this degree, a microbiologist may enter into the job market or opt for undertaking further higher studies in the subject. After graduation the students may join industry, academia, public health and play their role as Food Technologist in a useful manner contributing their role in the development of the welfare society. Thus the undergraduate level degree in Food Science & Technology must prepare the students for all these objectives. Thus the LOCF curriculum developed has a very wide range covering all aspects of Food Science & Technology with reasonable depth of knowledge and skills so as to diversify them in various specialties of the subject and play their role professionally as expected of them. It is also imperative that Food Technologists are evaluated in a manner appropriate to assess their proper development as Food Technologists. The current LOCF in Food Science & Technology has been designed in keeping all these important points in mind.

2.2 Aims of Bachelor Degree Programme in B.Sc. Food Science and Technology

The key objectives that underpin curriculum planning and development at the undergraduate level include Programme Learning Outcomes, and Course Learning Outcomes. For the B.Sc. Food Science and Technology course it includes:

- To demonstrate comprehensive knowledge and understanding of the food technology curriculum.
- To apply the principles of food science to preserve, process and package to assure the quality and safety of food products.
- To understand that the real-world problems in the food industry requires continuous acquisition of knowledge and its application to improve the safety and quality of a given food or process.
- To analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
- To acquire knowledge and skills, including “learning how to learn”, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, and adapting to changing trades and demands of work place through knowledge/skill development/re-skilling.

- To use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources.
- To acquire professional competency and entrepreneurial skills for economic empowerment.
- To demonstrate the ability to acquire, analyze, interpret and appropriately present laboratory data.

3. Graduate Attributes in B.Sc. Food Science and Technology

Disciplinary knowledge

Students are able to demonstrate comprehensive knowledge and understanding of one or more disciplines such as chemistry, bio-chemistry, mathematics, statistics, microbiology, engineering, management; regulations with support of different allied subjects of Life Science; Physical Science.

Communication Skills

Development of students' communication skills is planned through an AECC paper (English) which is compulsory for each student. Besides that the students do various assignments that enable them to develop skills in public speaking writing and effective's interpersonal skills. Presentations in each paper enhances their confidence, ability to express themselves; presentation skills.

Research-related skills

Students develop a scientific temper and a sense of enquiry through various Food Science and Technology papers. They have capabilities in asking relevant questions relating to current issues and themes and state hypothesis and rationale for inquiry. Students are capable of using appropriate research methodology especially for understanding safety issues in Food Science and Technology and reporting the results in different formats.

Cooperation/Team work

Students are capable of effective working in diverse contexts and teams in class rooms laboratories, student societies, industry and the community. They have basic management skills for independently organizing events, resource mobilization and leading community based projects, initiatives; cultural shows.

Self-directed learning

Students are capable of working independently and are able to apply the concepts of Food Science and Technology in an original; creative manner to solve and manage real life issues for the customers and industry. Students develop customized products as per the requirements of customers eg. Sugar free jams; sweets for diabetics, gluten free products for celiacs etc.

Multicultural competence

Students are confident of working in diverse socio-cultural contexts. They are able to effectively engage with multicultural groups and teams. They have sensitivities of cross cultural and ethnic diversity which they can apply to different settings. College through a student and faculty

exchange program with foreign university helps them to acquire multicultural competency. They are competent to seek higher education in foreign universities.

Moral and ethical awareness/reasoning

Student has awareness of ethical conduct in different situations (academic and personal). They have skills in understanding and avoiding unethical behavior such as misrepresentation, plagiarism and environmental misuse and violence. They are formally taught ethics of research and human interventions.

Leadership readiness/qualities

Students have leadership qualities in organizing teams and their mobilization for effective problem solving in different Food Science and Technology aspects. Students apply creative leadership for realization of various goals. As a leader, they are trained to have greater customer sensitivity and connect. They can organize food courts and design business plans.

Lifelong learning

Students acquire ability to gain knowledge and skills which are necessary in life for the holistic development for meeting their professional and personal needs in varying environment and changing contexts.

4. Qualification Descriptors for B.Sc. Food Science and Technology

The following descriptors indicate the expectations from B. Sc. Food Science and Technology:

- The students will have a sound knowledge of Food Science and Technology.
- They will understand the technologies of food processing and preservations of all food groups.
- They will understand food composition, nutritional, microbiological and sensory aspects.
- They will understand food safety and standards, both nationally and internationally.
- They will be versant with key principles of food engineering and packaging.

5. Programme Learning Outcome in B.Sc. Food Science and Technology

The learning outcome of the course are-

PLO1. Understand the concepts of different areas of food science and technology.

PLO2. . Understand the food composition and its physicochemical, nutritional, microbiological and sensory aspects.

PLO3. Comprehend the processing and preservation techniques of cereals, pulses, plantation crops, oilseeds, spices, fruits and vegetables, meat, fish, poultry, milk & milk products.

PLO4. Understand various concepts of food engineering, food packaging, food laws and regulations (national and international), food safety and quality assurance and food plant sanitation.

PLO5. Become a successful entrepreneur, professional and pursue higher education, apply skill based knowledge in food industry.

6. STRUCTURE OF B. SC. FOOD SCIENCE AND TECHNOLOGY UNDER LOCF

Core Course/ Hard core

1. FST- 101 INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY
2. FST- 102 FOOD CHEMISTRY
3. FST- 103 BIOCHEMISTRY AND NUTRITION
4. FST- 201 UNIT OPERATION IN FOOD PROCESSING
5. FST- 202 TECHNOLOGY OF FRUITS AND VEGETABLES PROCESSING
6. FST- 203 BASIC AND FOOD MICROBIOLOGY
7. FST-301 INSTRUMENTAL TECHNIQUES IN FOOD ANALYSIS
8. FST-302 CEREAL PULSES AND OIL SEED TECHNOLOGY
9. FST-303 DAIRY TECHNOLOGY
10. FST-401 TECHNOLOGY OF BEVERAGE, PLANTATION CROPS AND SPICES
11. FST-402 BAKERY, CONFECTIONERY AND EXTRUDED FOODS
12. FST-403 FOOD PACKAGING TECHNOLOGY
13. FST-501 MEAT, POULTRY & FISH TECHNOLOGY
14. FST-502 FOOD QUALITY, STANDARDS AND REGULATIONS
15. FST- 503 BUSINESS MANAGEMENT AND ENTREPRENEURSHIP
16. FST-601: INDUSTRIAL TRAINING & REPORT WRITING
17. FST-602 SEMINAR

Ability Enhancement Compulsory Courses (AECC)

1. FST- 105(BEN-711) COMMUNICATIVE ENGLISH
2. FST- 205 ENVIRONMENTAL STUDIES

Generic Electives (GE)

1. FST- 104 FOOD PROCESSING & PRESERVATION
2. FST-204 SENSORY EVALUATION OF FOODS
3. FST-305 FOOD PROCESS ENGINEERING
4. FST-405 STATISTICS AND DOCUMENTATION SKILL

Discipline specific elective (DSE)/ soft core (Any Four)

1. FST-504 NEUTRACEUTICALS AND HEALTH FOODS
2. FST-505 TEA PLANTATION TECHNOLOGY
3. FST-506 FOOD BIOTECHNOLOGY AND TOXICOLOGY
4. FST-603 PROJECT/DISSERTATION
5. FST-604 AROMATIC AND MEDICINAL PLANT
6. FST-605 FOOD HYGEINE AND SANITATION

Skill enhancement courses (SEC)

1. FST-304 FOOD FERMENTATION TECHNOLOGY
2. FST-404 FOOD PRODUCT DEVELOPMENT

PROPOSED SCHEME FOR LOCF FOR B. SC. FOOD SCIENCE AND TECHNOLOGY

Semester	CORE COURSE (14)	Elective: Discipline Specific DSE (4)	Elective: Generic (GE) (4)	Ability Enhancement Compulsory Course (AECC) (2)	Skill Enhancement Course (SEC) (2)
I	FST- 101 INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY FST- 102 FOOD CHEMISTRY FST- 103 BIOCHEMISTRY AND NUTRITION		FST- 104 FOOD PROCESSING & PRESERVATION	FST- 105(BEN-711) COMMUNICATIVE ENGLISH	
II	FST- 201 UNIT OPERATIONS IN FOOD PROCESSING FST- 202 TECHNOLOGY OF FRUITS AND VEGETABLES PROCESSING FST- 203 BASIC AND FOOD MICROBIOLOGY		FST-204 SENSORY EVALUATION OF FOODS	FST- 205 ENVIRONMENTAL STUDIES	
III	FST-301 INSTRUMENTAL TECHNIQUES IN FOOD ANALYSIS FST-302 CEREAL PULSES AND OILSEED TECHNOLOGY FST-303 DAIRY TECHNOLOGY		FST-305 FOOD PROCESS ENGINEERING		FST-304 FOOD FERMENTATION TECHNOLOGY
IV	FST-401 TECHNOLOGY OF BEVERAGE, PLANTATION CROPS AND SPICES FST-402 BAKERY, CONFECTIONERY AND EXTRUDED FOODS FST-403 FOOD PACKAGING TECHNOLOGY		FST-405 STATISTICS AND DOCUMENTATION SKILL		FST-404 FOOD PRODUCT DEVELOPMENT
V	FST-501 MEAT, POULTRY & FISH TECHNOLOGY FST-502 FOOD QUALITY STANDARDS AND REGULATIONS FST- 503 BUSINESS MANAGEMENT AND ENTREPRENEURSHIP	FST-504 NEUTRACEUTICALS AND HEALTH FOODS FST-505 TEA PLANTATION TECHNOLOGY FST-506 FOOD BIOTECHNOLOGY AND TOXICOLOGY			
VI	FST-601: INDUSTRIAL TRAINING & REPORT WRITING FST-602 SEMINAR	FST-603 PROJECT/DISSERTATION FST-604 AROMATIC AND MEDICINAL PLANT FST-605 FOOD HYGIENE AND SANITATION			

Restructured Curriculum with LOCF Programme in **B.Sc. Food Science and Technology**

Syllabus Contents

Semester	COURSE CODE	Paper Code	Title of the Paper	Credits	Nature	Distribution of Marks		
					T/P	Internal	End Semester	Total
I	C1	FST- 101	INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY	4	T	30	70	100
	C2	FST- 102	FOOD CHEMISTRY	4	T	30	70	100
	C3	FST- 103	BIOCHEMISTRY AND NUTRITION	4	T	30	70	100
	GE1	FST- 104	FOOD PROCESSING & PRESERVATION	4	T	30	70	100
	AECC1	FST-105 (BEN-711)	COMMUNICATIVE ENGLISH	4	T	30	70	100
	P-1	FST-106	PRACTICAL –I	4	P	30	70	100
			TOTAL	24	-	180	420	600
II	C4	FST- 201	UNIT OPERATIONS IN FOOD PROCESSING	4	T	30	70	100
	C5	FST- 202	TECHNOLOGY OF FRUITS AND VEGETABLES PROCESSING	4	T	30	70	100
	C6	FST- 203	BASIC AND FOOD MICROBIOLOGY	4	T	30	70	100
	GE2	FST- 204	SENSORY EVALUATION OF FOODS	4	T	30	70	100
	AECC	FST- 205	ENVIRONMENTAL STUDIES	4	T	30	70	100
	P-2	FST-206	PRACTICAL –II	4	P	30	70	100
			TOTAL	24		180	420	600
III	C7	FST-301	INSTRUMENTAL TECHNIQUES IN FOOD ANALYSIS	4	T	30	70	100
	C8	FST-302	CEREAL, PULSES AND OILSEED TECHNOLOGY	4	T	30	70	100
	C9	FST-303	DAIRY TECHNOLOGY	4	T	30	70	100
	SEC1	FST-304	FOOD FERMENTATION TECHNOLOGY	4	T	30	70	100
	GE3	FST-305	FOOD PROCESS ENGINEERING	4	T	30	70	100
	P-3	FST-306	PRACTICAL –III	4	P	30	70	100
			TOTAL	24		180	420	600
IV	C10	FST-401	TECHNOLOGY OF BEVERAGE, PLANTATION CROPS AND SPICES	4	T	30	70	150
	C11	FST-402	BAKERY, CONFECTIONARY AND EXTRUDED FOODS	4	T	30	70	100

	C12	FST-403	FOOD PACKAGING TECHNOLOGY	4	T	30	70	100
	SEC2	FST-404	FOOD PRODUCT DEVELOPMENT	4	T	30	70	100
	GE4	FST-405	STATISTICS AND DOCUMENTATION SKILL	4	T	30	70	100
	P-4	FST-406	PRACTICAL –IV	4	P	30	70	100
			TOTAL	24		180	420	600
V	C13	FST-501	MEAT, POULTRY & FISH TECHNOLOGY	4	T	30	70	100
	C14	FST-502	FOOD QUALITY STANDARDS AND REGULATIONS	4	T	30	70	100
	C15	FST-503	BUSINESS MANAGEMENT AND ENTREPRENEURSHIP	4	T	30	70	100
	DSE 1,2 Elective (Any Two)	FST-504	NEUTRACEUTICALS AND FUNCTIONAL FOODS	4	T	30	70	100
		FST-505	TEA PLANTATION TECHNOLOGY					
		FST-506	FOOD BIOTECHNOLOGY AND TOXICOLOGY					
	P-5	FST-507	PRACTICAL -V	4	P	30	70	100
			TOTAL	24	-	180	420	600
VI	C16	FST-601	INDUSTRIAL TRAINING & REPORT WRITING	12	P	30	70	100
	C17	FST-602	SEMINAR	2	P	15	35	50
	DSE3	FST-603	PROJECT/ DISSERTATION	4	P	30	70	100
	DSE4 Elective (any two)	FST-604	AROMATIC AND MEDICINAL PLANT	4	T	30	70	100
		FST-605	FOOD HYGEINE AND SANITATION					
	P-6	FST-606	PRACTICAL -VI	2	P	15	35	50
	NCM	Audit paper	MOOCs (Compulsory audit course)	-	-	-	-	-
			TOTAL	24	-	125	275	400
C-Core Course DSE-Discipline Specific Elective GE-Generic Electives AECC-Ability Enhancement Compulsory Courses SEC- Skill Enhancement Elective Courses T= Theory; P= Practical (Lab/Fieldwork/Dissertation/Project etc.) Note: For the MOOCs-based Compulsory Audit Course, simply “Satisfactory” or “Unsatisfactory” shall be mentioned								

Details of Courses for B.Sc. Food Science and Technology

SEMESTER - I

FST-101: INTRODUCTION TO FOOD SCIENCE AND TECHNOLOGY (CREDITS: 4)

CLO1: (0.20) To understand the history and evolution of food processing and to make aware about the career and present scenario of Food and nutrition.

CLO2 : (0.25) Students will get thorough knowledge of the structure and composition of cereals, pulses and oil-seeds.

CLO3: (0.15) To give complete description of meat and meat products and their processing

CLO4: (0.15) To learn about the technologies behind the processing of milk and their products.

CLO5: (0.25) .To learn about traditional Indian foods and genetically modified and organic foods.

Theory

UNIT -1

(HOURS: 10)

Food industry: History and developments of important food industries in India.

Introduction: Basics of food science & technology; relationship with other disciplines; career opportunities. Significance of food science and technology. Global and national food and nutrition situation.

UNIT -2

(HOURS: 15)

Food from Plant Sources

Food grains: cereals; structure and composition of cereals, post harvest processing, foods from cereals. Grain legumes; composition of legumes, processing of pulses. Oilseeds: characteristics, processing of oilseeds. Horticultural crops: structure and composition, post harvest technology.

UNIT -3

(HOURS: 20)

Foods of Animal Origin

Meat and meat products: livestock, poultry and meat production, wholesome meat production, processed meats, eggs and egg products, egg quality, shell egg processing, spoilage and preservation of shell egg, packaging and transport of shell eggs, egg products. Milk and milk products; clean production of market milk, milk processing. Fish and fishery products; aquatic animal production, processing, deterioration of fish and shellfish.

UNIT -4

(HOURS: 15)

Other Foods

Traditional Indian foods; honey; composition, uses and health benefits, safety concerns.

Genetically modified foods; technology, benefits, risks, regulations. Infant foods; traditional infant foods, commercial infant foods and formulae, concerns and regulations. Organic foods; advantages, concerns and regulations.

Books Recommended

Potter, N.N. and Hotchkiss, J.H. 2007. Food science. The AVI Pub. Co. Inc., Westport, Connecticut, USA.

Bawa. A.S, O.P Chauhan et al. Food Science. New India Publishing agency, 2013.

FST-102: FOOD CHEMISTRY (CREDITS: 4)

CLO1: (0.15) To provide thorough understanding of different properties of water and their effect in shelf life

CLO2: (0.25) To understand the chemical structure and the different reactions of various components of food

CLO3: (0.20) To provide comprehensive knowledge about the physical and functional properties of the proteins

CLO4: (0.25) To provide comprehensive knowledge about the physical and functional properties of different vitamins

CLO5:(0.15) To understand the basic characteristic and stability of colors, flavor, enzyme and other aromatic compounds

Theory

UNIT -1

(HOURS: 8)

Water: types, properties, structure, water activity, sorption isotherms, effect on shelf life of food.

UNIT -2

(HOURS: 15)

Carbohydrates: classification, structure, physical and chemical properties, browning reactions; enzymatic browning, caramelization, Maillard reaction, dietary fiber. Lipids: classification, structure, fatty acids, properties, rancidity, emulsifiers, antioxidant.

UNIT -3

(HOURS: 15)

Proteins: classification, structure, amino acids, chemical, physical and functional properties.
Mineral elements: introduction, chemical and functional properties.

UNIT -4

(HOURS: 10)

Vitamins: classification, properties, structure, stability.
Fortification – Need and Types.
Colors and pigments: functions, properties, stability.

UNIT -5

(HOURS: 12)

Flavors: characteristics – taste and other saporous substances, aromatic compounds.
Enzymes: nature, functions, classification. Important enzymes in food processing.

Books Recommended

1. Damodaran, S., Parkin, K.L. and Fennema, O.R. 2008. Fennema,,s food chemistry. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.
- . DeMan, J.M. 2007. Principles of food chemistry. Springer Verlag, Heidelberg, Germany.
3. Belitz, H.D, Groschm, W. and Schieberle, P. 2004. Food chemistry. Springer Verlag, Heidelberg, Germany.

FST- 103: BIOCHEMISTRY AND NUTRITION (CREDITS: 4)

CLO1: (0.20) To understand the concept of food, nutrients, diet, balanced diet.

CLO2: (0.15) To classify foods into various food groups and understand the food pyramid.

CLO3: (0.15) To understand various different nutrients present in food, its types, sources and dietary requirements in the body.

CLO4: (0.25) To have a basic knowledge about the various important functions of the different nutrients required to maintain proper health

CLO5: (0.25) To understand digestion and absorption of various nutrients inside the human body.

Theory

UNIT -1

(HOURS: 15)

Introduction: definitions, food, nutrients, diet, balanced diet, food groups, food guide pyramid, meal planning. Eating food: smell, taste, satiety.

Water: functions, sources, regulation in body, water and electrolytic balance, dietary requirements, content in food.

UNIT -2

(HOURS: 10)

Carbohydrates: types, role in body, dietary fiber, sweeteners, dietary requirements, content in food.

Fats and oils: types, functions, dietary requirements, content in food, fat substitutes.

UNIT -3

(HOURS: 15)

Proteins: amino acids, protein synthesis, classification, functions, quality of proteins, dietary requirements, content in foods.

Vitamins: classification, role in body, content in food. Mineral elements: types, requirements, sources, functions.

UNIT -4

(HOURS: 20)

Digestion: alimentary tract, digestive juices, secretions, digestion of carbohydrate, TCA cycle, glycolysis, glycogenolysis, glyconeogenesis pathway, ETC.

Absorption and metabolism of nutrients: carbohydrates, protein, lipids. Nutrient and dietary deficiency disorders: malnutrition, obesity, coronary diseases, diabetes, lactose and gluten intolerance, dental caries – symptoms, causes, prevention.

Books Recommended

1. Geissler, C. and Powers, H. 2010. Human nutrition. Churchill Livingstone, London, UK.
2. Awan, J.A. 2007. Elements of food and nutrition. Unitech Communications, Faisalabad- Pakistan.
3. Bamji, M.S., Rao, N.P. and Reddy, V. 2004. Textbook of human nutrition. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, India.
4. Eastwood, M. 2003. Principles of human nutrition. John Wiley & Sons, Inc., New York, USA.

FST-104: FOOD PROCESSING & PRESERVATION (CREDITS: 4)

CLO1: (0.25) To impart knowledge about post harvest handling of foods for food processing

CLO2: (0.25) To learn about various heat processing methods and their effects on the nutritional aspects of food

CLO3: (0.15) To provide complete knowledge of all the chemical additives used in foods and standards

CLO4: (0.20) To understand the fermentation process and its usage in preparation of different products

CLO5: (0.15) To learn about the sciences behind the fermented products

Theory

UNIT -1

(HOURS: 18)

Postharvest handling and preparation of foods for food processing: introduction, properties of raw materials, storage and transportation of raw materials. Preparatory operations: cleaning, sorting, grading, size reduction, blanching, sulphiting, minimal processing technology.

UNIT -2

(HOURS: 20)

Heat processing: methods – thermisation, pasteurization, HTST, commercial sterilization, UHT. Canning: unit operations. Retort operation: equipment. Effect of heat processing: nutrients, microorganisms. Low temperature preservation: refrigeration: methods and equipments. Cold storage: requirements, insulation, air circulation, humidity, refrigeration load, controlled atmospheric storage.

UNIT -3

(HOURS: 20)

Freezing: theory, equipment and changes in foods. Evaporation and dehydration: evaporation – concentration and condensation, principles, equipments, applications. Drying – principles, equipments, types of driers – cabinet (tray), kiln, tunnel, conveyer (belt), fluidized, pneumatic (flash), rotary. Dehydration: applications, dehydrated products – vegetables, fruits and milk.

UNIT -4

(HOURS: 15)

Use of chemical additives: contaminants, adulterants, additives. Food additives: classification, criteria for selection, GRAS additives, permissible limits, food safety, E-numbers. Preservation by fermentation technology: principles, objectives, types - alcoholic, acetic and lactic fermentations.

UNIT -5

(HOURS: 12)

Fermented foods: bread, wine, vinegar, yoghurt, sausages, pickles. Food irradiation: principles, applications, equipments, safety aspect, effect on food properties, detection methods.

Books Recommended

1. Awan, J.A. 2009. Food processing and preservation. Unitech Communications, Faisalabad, Pakistan.
2. Awan, J.A. and Rehman, S.U. 2009. Food preservation manual. Unitech Communications, Faisalabad, Pakistan.
3. Rahman, M.S. 2007. Handbook of food preservation. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.
4. Brennan, J.G. 2006. Food processing handbook. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany.
5. Fellow, P.J. 2005. Food processing technology: principles and practices, 2nd ed. CRC Press, Taylor & Francis Group, Boca Raton, Florida.

Theory

Unit 1 (HOURS: 15)

Literary Texts (Poetry) This particular unit will help the students to enjoy, understand and interpret poems and develop a taste for fine poetry. The texts that have been chosen to be included are as follows:

“The Poison Tree” by William Blake
“The Daffodils” by William Wordsworth
“If” by Rudyard Kipling.

Unit 2 (HOURS: 15)

Literary Texts (Prose)

This particular unit will help the students to foster a taste for literary prose pieces. The texts that have been chosen to be included are as follows:

“The Stolen Bacillus” by H.G. Wells
“The Verger” by Somerset Maugham
“Shooting an Elephant” by George Orwell.

Unit 3 (HOURS: 15)

Grammar and Usage:

Determiners, Tenses, Voice, Direct and Indirect Speech, Punctuation, Word Formation, Antonyms and Synonyms, Homophones, One-word substitution. Idioms and Phrases.

Unit 4 (HOURS: 15)

Writing Skills:

This part would include areas like official correspondence, Letter (Formal and Informal), Circular, Notice, Writing Cvs/ Resume, Essay writing, e-mail writing, Blog writing, Story Writing, Paragraph writing. The second section of this part will include **Comprehension** and **Precis Writing** that will enable the students to understand a particular passage and then express their opinions in their own language. This will enhance the student's reading and writing abilities.

Suggested Readings:

- Nilanjana Gupta, *Communicate With Confidence*, Anthem Press.
V. Shyamala, *Effective English Communication for You*, Emerald Publisher.
Krishnamohan and Meera Bannerji, *Developing Communication Skills*.
R.K. Madhukar, *Business Communication*, Vikash Publishing house Pvt. Ltd.
Shalin Sharma, *Concepts of Professional Communication*, Acme Learning
Daniel Jones, *English Phonetics*.
R.K. Bansal and Harrison, *Spoken English for India*, Sec. Ed. Madras Orient Longman.
Donald Treadwell and Jill B. Treadwell, *Public Relations Writing*, Sec. Ed. Sage Publications, Inc.
P.D. Chaturvedi and Mukesh Chaturvedi, *Business Communication Concepts, Cases and Applications*, Sec. Ed. Manipal Press Limited.
Sarah Trenholm and Arthur Jensen, *Interpersonal Communication*, Sixth Ed. Oxford University Press.
Pulak Bhattacharyya (ed), *Musings- II: A Collection of English Prose*, Book Land Publishers.
David V. Erdman(ed), *The Complete Poetry and Prose of William Blake*, Anchor Publishers.
Maugham, Somerset, 65 Short Stories, Heinemann: London, 1988[rpt] Henry Reed(ed), *The Complete Poetical Works of William Wordsworth*, Troutman and Hayes Publishers

FST-106 : Practical –I (CREDITS: 4)

CLO1: (0.20) To acquaint students with the various laboratory instruments used in food processing analysis

CLO2: (0.25) To give comprehensive knowledge to students regarding practical laboratory works related to the preliminary analysis of the food materials.

CLO3: (0.25) To give detailed understanding of the analytical processes to be used in food processing and preservation laboratories

CLO4: (0.15) To increase the better documentation and communication abilities of students

CLO5: (0.15) To provide students better computing skills through practical exposures.

FOOD SCIENCE AND FOOD CHEMISTRY LAB.

Practical

Use of laboratory equipments. Estimation of moisture, fat, protein, carbohydrates, fiber and ash in food samples.

Determination of soluble solids, total solids, pH, acidity, total sugars, specific gravity.

Determination of calorific value of foods.

Detection of presence of starch by Iodine test.

Determination of water activity of different food materials.

Determination of minerals.

FOOD PROCESSING & PRESERVATION LAB

Blanching and sulphiting of selected fruits, vegetables. Freezing of fruits and vegetables. Drying and Dehydration of fruits and vegetables. Drying foods in tray dryer and fluidized bed dryer, vacuum freeze dryer.

Use of food additives in preservation of food products. Preservation of vegetables with vinegar, and pickles. Evaluation of bottled, frozen and dehydrated products. Visit to food industries.

SEMESTER- II

FST-201: UNIT OPERATION IN FOOD PROCESSING (CREDITS: 4)

- CLO1: (0.15)** Students will have a thorough understanding of all the unit operations related to food system
- CLO2: (0.25)** This course provide thorough understanding of heat transfer, mass transfer as well as Energy transfer fundamentals
- CLO3: (0.20)** The course gives the idea about different fluid flow behavior in food
- CLO4: (0.15)** The students will get complete knowledge of different filtration methods used in food system
- CLO5: (0.25)** The course also includes all the non thermal preservation techniques

Theory

UNIT 1 (HOURS: 20)

Energy and mass balance: heat transfer fundamentals – conduction, convection and radiation. Mass balance equations and Pearson's Law. Distillation: Distillation, Steam distillation, applications and equipment – determination of height equivalent of theoretical plate (HETP) – McCabe-Thiele method – reflux ratio. Molecular distillation, theory and examples. Mass transfer phenomenon applied to food systems

UNIT -2 (HOURS: 20)

Fluid flow in food processing: Liquid Transport Systems – Pipes and Pumps, PUMPS- Definition, classification, positive displacement and centrifugal pumps, factors affecting choice Of a pump, Properties of liquids - Density, Pressure, Surface tension and Viscosity. Air-water mixture: psychometric charts and their application.

UNIT- 3 (HOURS: 15)

Rheology of food products: stress, deformation and other aspects. Newtonian and non Newtonian fluids, laminar and turbulent fluid, The Continuity equation, Reynolds number, Energy equation for steady flow of fluids – pressure, kinetic energy, potential energy, frictional loss, power requirements of a pump.

UNIT -4 (HOURS: 10)

Membrane filtration technology: Principles of other food processing such as-RO, UF, dialysis, osmosis, microfiltration and nano filtration -outlines.

UNIT -5 (HOURS: 10)

Non-thermal preservation: Hydrostatic pressure, dielectric heating, microwave processing, high pressure, pulsed electric field, hurdle technology, irradiation.

Books Recommended

1. McCabe, W.L., Smith, J.C and Harriott, P. 2005. Unit operations of chemical engineering. McGraw Hill Inc., New York, USA.
2. Earle, R.L. and Earle, M. D. 2004. Unit operations in food processing (web edition). The New Zealand Institute of Food Science and Technology. Available at: <http://www.nzifst.org.nz/unitoperations/>.
3. Jeankopolis, C.J. 2004. Transport processes and separation process. Prentice Hall Professional Technical Reference, New Jersey, USA.
4. Gustavo, A and Barbosa-Canovas, V. 2002. Unit operations in food engineering. CRC Press, Taylor & Francis Group, Boca Raton, Florida.

FST-202: TECHNOLOGY OF FRUITS AND VEGETABLES PROCESSING (CREDITS: 4)

CLO1: (0.25) Students will have thorough understanding of various methods to identify any disorder in fresh fruits and vegetables.

CLO2: (0.20) Students will get thorough idea of the techniques used to increase palatability of fruits and vegetables.

CLO3: (0.25) Students will get to know all the processing techniques to make value added products from fruits and vegetables.

CLO4: (0.15) Students will have thorough knowledge of different transportation, packaging and storing techniques of fresh as well as processed products.

CLO5: (0.15) Students will get to know the methods used for increasing shelf life.

Theory

UNIT -1

(HOURS: 20)

Postharvest technology: introduction, production, losses, causes, trade. Fruit ripening: changes during ripening, recommended conditions, commercial practices, water loss, respiration activity. Harvesting and handling methods. Maturity assessment of different fruits and vegetables.

Ripening process: respiration, climacteric and non-climacteric patterns, pectin substances, ripening conditions. Postharvest physiology of fruits and vegetables.

UNIT -2

(HOURS: 15)

General properties of fruits and vegetables: chemical composition, nutritional aspects, structural features, choice of processing technologies. Maintaining post-harvest quality of fruits and vegetables: quality criteria, quality deterioration – measurement and maintenance. Spoilage factors (chemical, enzymatic, biological) and their control.

UNIT -3

(HOURS: 20)

Preparatory Operations: Cleaning, sorting, grading, peeling and blanching methods. Postharvest treatments: coatings, curing, vapor heat treatment, hot water treatment, degreening. Storage: refrigerated, CA, hypobaric, MAS. Packaging: types, design, modified atmospheric packaging, Recycling. Cold chain: Zero energy cool chamber, packing house operations, transportation. Safety and quality of fruits and vegetables.

UNIT -4

(HOURS: 20)

Processed fruit products: Jam- (definition, standards, method of manufacture); Jelly- (definition, standards, method of manufacture); Marmalades- (definition, standards, method of manufacture). Juice (Extraction, Clarification, pasteurization, Preservation) Unfermented beverages- classification, standards and preparation of Natural juice, sweetened juice, RTS, Nectar, Cordial, Squash, Crush, Syrup.

Other products: sauerkraut, mango slices, mango leather, fruit cheese, fruit butter, fruit toffee. Utilization of fruits and vegetable waste.

UNIT -5

(HOURS: 10)

Processed vegetable products: Potato Processing- manufacture of potato chips, French fries and potato flour. Tomato processing- manufacture and standards of tomato juice, tomato puree, tomato paste, tomato ketchup, tomato soup.

Books Recommended

Chakraverty, A., Mujumdar, A.S., Raghavan, G.S.V., Ramaswamy, H.S. 2003. Handbook of postharvest technology: cereals, fruits, vegetables, tea, and spices, Marcel Dekker, Inc., New York, USA.

Thompson, A.K. 2003. Fruit and vegetables harvesting, handling and storage. Blackwell Science Pub., Cambridge, UK.

Awan, J.A and Rehman, S.U. 2009. Food preservation manual. Unitech Communications, Faisalabad, Pakistan.

Jongen, W. (Ed). 2002. Fruit and vegetable processing – improving quality. Woodhead Publishing. Ltd., Abington, Cambridge, UK.

Srivastava, R.P. and Sanjeev, K. 2002. Fruit and vegetable preservation: principles and practices. International Book Distributing Co., Lucknow, India.

Dauthy, M.E. 1995. Fruit and vegetable processing. FAO Agricultural Services Bulletin No. 119. Food and Agriculture Organization of the United Nations, Rome, Italy.

FST-203: BASIC AND FOOD MICROBIOLOGY (CREDITS: 4)

CLO1: (0.25) To acquaint students the cellular structure and characteristics of different types of microorganisms.

CLO2: (0.15) To help students understand the growth pattern, and the control agents for different microorganisms.

CLO3: (0.25) To provide students a thorough understanding of various factors responsible for food spoilage.

CLO4: (0.20) To make students understand the specifications of various contamination sources and disease developed in certain processed products.

CLO5: (0.15) Students will also have an exposure to various equipments, reagents and techniques used for microbial analysis of food products.

Theory

UNIT-1

(HOURS: 28)

Introduction to microbiology: Historical background and branches of microbiology. Significance of microorganisms in food, Cell theory, difference between prokaryotic and eukaryotic cells, Haeckel's Kingdom protista, Whittaker five kingdom classification, Germ theory and Koch's postulates, Characteristics of bacteria, yeasts, moulds, viruses. Structures and types of microbial cells (bacteria, yeast and mold). Working principle of light microscopes (Dark-field, Bright-field, Fluorescence and Phase contrast microscopes) and electron microscopes, Simple and differential staining techniques.

UNIT-2

(HOURS: 12)

Microbial Growth: Growth curve and its different phases, Factors affecting microbial growth, Generation time, Synchronous and Asynchronous growth, Culture maintenance and preservation.

UNIT-3

(HOURS: 15)

Microbial Spoilage of foods: Contamination of foods, Microbial spoilage of milk & milk products, meat, fish, poultry & egg products, fruits & vegetable products, Cereal grains, bakery and confectionery products, fermented and canned foods.

UNIT-4

(HOURS: 10)

Food borne diseases: Food intoxications (Botulism, Staphylococcal Gastroenteritis) and infections (Salmonella, Shigella, *Clostridium perfringenes*, *Bacillus cereus* and *E.coli* infections), Mycotoxins (Aflatoxin, Patulin, Ochratoxin) and their causative agents

UNIT-5

(HOURS: 15)

Control of micro-organisms: Concept of TDT, F, z and D-value, Microbial spores, Physical & chemical anti-microbial agents - .Temperature, Osmotic pressure, Radiations, Surface tension, Filtration, Phenols, Alcohols, Halogens (iodine and chlorine), Heavy metals, Detergents, Quaternary Ammonium compounds, Aldehydes, Ethylene oxide.

Books Recommended

- Tortora, G.J., Funke, B.R. and Case, C.L. 2009. Microbiology: an introduction. The Benjamin/Cummings Pub. Co, Redwood City, California, USA.
- Frazier, W.C. and Westhoff, D.C. 2008. Food microbiology. McGraw Hill Book Co, New York, USA.
- Awan, J.A. and Rahman, S.U. 2005. Microbiology manual. Unitech Communications, Faisalabad, Pakistan.
- Banwart, G.J. 2004. Basic food microbiology, 2nd ed. CBS Publishers and Distributors, New Delhi, India.

FST-204: SENSORY EVALUATION OF FOODS (CREDITS: 4)

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- CLO1: (0.25)** To acquaint with sensory quality parameters of food
- CLO2: (0.15)** To provide comprehensive knowledge about the methods of sensory evaluation of foods.
- CLO3: (0.20)** To study the impact of food processing on its sensory and nutritional quality.
- CLO4: (0.15)** To understand the different problems related to sensory.
- CLO5: (0.25)** To give thorough understanding of different tests used in sensory evaluation.
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THEORY

UNIT- 1

(HOURS: 25)

Taste: Introduction and importance of taste, Structure and physiology of taste organs- tongue, papillae, taste buds, salivary glands, Mechanism of taste perception, Chemical dimensions of basic tastes- sweet, salt, sour, bitter and umami, Factors affecting taste quality, reaction time, taste modification, absolute and recognition, threshold Taste abnormalities, Taste measurement.

Odour: Introduction, definition and importance of odour and flavor Anatomy of nose, physiology of odor perception, mechanism of odor perception, Odor classification, chemical specificity of odor. Odor measurement using different techniques – primitive to recent techniques. Merits and demerits of each method. Olfactory abnormalities

UNIT-2

(HOURS: 20)

Color: Introduction and importance of colour. Dimensions of color and attributes of color, appearance factors, gloss etc. Perception of color. Color abnormalities, Measurement of color; Munsell color system, CIE color system, Hunter color system, spectrophotometry and colorimetry etc.

Texture: Introduction, definition and importance of texture, Phases of oral processing, Texture perception, receptors involved in texture perception, Texture classification, Texture measurement – basic rheological models, forces involved in texture measurement.

UNIT -3

(HOURS: 10)

Introduction to sensory analysis; general testing conditions, Requirements of sensory laboratory; organizing sensory evaluation programme. Selection of sensory panelists; Factors influencing sensory measurements; Sensory quality parameters -Size and shape, texture, aroma, taste, color and gloss.

UNIT -4

(HOURS: 10)

Different tests for sensory evaluation– discrimination, descriptive, affective; Flavor profile and Ranking tests.

Books Recommended

- Kemp, S.E., Hollywood, T and Hort, J. 2009. Sensory evaluation: a practical handbook. John Wiley & Sons Inc., New York, USA.
- Chambers, E. and Wolf, M.B. 2005. Sensory testing methods. American Society for Testing and Materials, West Conshohocken, Pennsylvania, USA.
- Stone, H. and Sidel, J.L. 2004. Sensory evaluation practices. Elsevier Academic Press, California, USA.
- Carpenter, R.P., Hasdell, T.A. and Lyon, D.H. (Eds). 2000. Guidelines for sensory analysis in food product development and quality control. Aspen Publishers, Inc., Gaithersburg, Maryland, USA.
- Lawless, H.T. and Heymann, H. 1998. Sensory evaluation of food: principles and practices. Kluwer Academic Publishers, Massachusetts, USA.

BEV 720 : ENVIRONMENTAL STUDIES (CREDITS: 4)

CLO1: To provide knowledge about the multidisciplinary nature of environmental science

CLO2: To give comprehensive knowledge about various resources and their impact on human life.

CLO3: To understand the concept of ecosystem, biodiversity and their conservation

CLO4: To acquaint and understand environmental pollution, climate change, global warming and how rise in human population impacts environmental issues.

CLO5: To access the nearby areas for potential threats to the environment.

Theory

UNIT-1

(HOURS: 20)

Multidisciplinary nature of environmental studies:

Definition, scope and importance environmental studies. Relationship of environmental science with other branches of sciences. Need for public awareness regarding environment.

UNIT-2

(HOURS: 15)

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT-3

(HOURS: 15)

Ecosystems

Concept of an ecosystem. Structure and function of an ecosystem. Concept of producers, consumers and decomposers. Energy flow in the ecosystem. Food chains, food webs and ecological pyramids. Ecological succession.

UNIT-4

(HOURS: 10)

Biodiversity and its conservation

Definition of genetic, specific and ecosystem diversity.

FST -206: Practical –II (CREDITS: 4)

CLO1: (0.15) To give detailed practical knowledge about the various unit operations related to processing of food materials.

CLO2: (0.25) To teach students the practical techniques for processing of fruits and vegetables.

CLO3: (0.15) To prepare and understand the science behind production of fruits and vegetable based products

CLO4: (0.25) To provide students a knowledge about the various spoilage organisms, their growth, culture media, enumeration and isolation techniques used for microbiological analysis of food products.

CLO5: (0.20) To teach students the analytical techniques of food materials for sensory evaluation.

UNIT OPERATIONS LAB

Practical:

1. Units and dimensions and their conversion
2. Mass and energy balance
3. Heat transfer in foods
4. Application of psychometrics chart
5. Rheological properties of food materials
6. Studies on membranes separation processes.
7. Solvent extraction method for edible oil by soxhlet method.

FRUITS AND VEGETABLES PROCESSING LAB

Practical :

Determining harvest maturity of different fruits and vegetables. Grading and sorting. Changes in physical and chemical quality parameters of fruits during storage - weight loss, acidity, TSS, vitamin C. Effect of packaging materials on stored fruits and vegetables. Effect of different chemicals - anti-sprouting, anti-ripening. Preparation of fruits and vegetables products: dried, frozen and canned. Manufacturing of pickle, juice concentrate, and ready to serve juices, squashes, syrups and fruit candies. Visit to fruit and vegetable processing units.

FOOD MICROBIOLOGY LAB

Practical

Safety in microbiological laboratory. Basic functions and handling of laboratory equipments. Use of microscope. Sterilization and disinfection of glassware. Preparation of culture media. Staining of microorganisms and their structures. Bacterial cultivation, growth measurement. Characteristics of bacterial colonies. Bacterial and fungal morphology. Micrometry.

Isolation, identification and characterization of micro organisms: morphology, biochemical. Enumeration of microorganisms in food and water samples (total count, SPC, Yeast and Mold, viable count, MPN). Examination of foods for pathogenic organisms (*Escherichia coli*, Coliform, *Salmonella* and *Listeria monocytogenes*).

SENSORY EVALUATION OF FOODS

Practical

Training of panelists by difference tests such as triangle test, paired comparison test, hedonic scale, duo-trio test. Color, threshold determination and ranking. Consumer test analysis.

SEMESTER- III

FST-301: INSTRUMENTAL TECHNIQUES IN FOOD ANALYSIS (CREDITS: 4)

CLO1: (0.20) To give thorough understanding basic chemical properties of solutions.

CLO2: (0.25) Students will have a thorough understanding on the working principle and instrumentation of various instruments used in food analysis.

CLO3 : (0.25) The course will provide of fundamentals of chemical solutions.

CLO4:(0.15) Students will become expertise in all the sophisticated instrumentation

CLO5: (0.15) The students will know the importance of various methods to identify any malfunction aspect of food and different microbial assays.

Theory

UNIT-1

(HOURS: 10)

Preparation of chemical solutions: Concept of molar and normal solutions.
pH and Buffers: Importance and measurement of pH.

UNIT-2

(HOURS: 20)

Chromatographic techniques: General principles. Partition and adsorption chromatography. Paper, thin layer, gas liquid, ion exchange and affinity chromatography. Gel filtration. Introduction to High Pressure Liquid Chromatography.

UNIT-3

(HOURS: 15)

Spectroscopy: Concepts; Laws of photometry; Beer-Lambert's law; Visible and UV spectroscopy; Principles and applications of colourimetry; Atomic Absorption Spectrometer; X-ray diffraction; NMR

UNIT-4

(HOURS: 10)

Fluorimetry: Spectrofluorimeters. Flame photometry and atomic absorption spectrophotometry. Use of radioisotopes.

UNIT-5

(HOURS: 5)

Microbiological assays. Microscopy

Books Recommended

1. Otles, S. 2009. Handbook of food analysis instruments. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.
2. Nielson, S.S. 2003. Food analysis, Kluwer Academic/Plenum Pub., New York, USA.
3. Pomeranz, Y. and Meloan, C.E. 2000. Food analysis: theory and practice. CBS Publishers, New Delhi, India.

FST-302: CEREAL, PULSES AND OILSEED TECHNOLOGY (CREDITS: 4)

CLO1: (0.15) To acquaint with production and consumption trends of different types of cereals, pulses and oilseeds.

CLO2: (0.25) To provide students knowledge about the structure, and composition of different cereals, pulses and oilseeds.

CLO3: (0.20) To teach quality evaluation, and processing technologies of various cereals, pulses and oilseeds.

CLO4: (0.25) To provide insight of Product development and value addition of various cereals, pulses and oilseeds.

CLO5: (0.15) To provide the students the science behind the spoilages in food.

Theory

UNIT- 1

(HOURS: 20)

Cereal grains: importance, production, structure, composition, nutrition: Grain grades and grading. Storage: methods, types, role of temperature and moisture, safe storage methods. Dry milling process: cleaning, tempering, conditioning.

Grinding process: types of grinding machines. Sieving process: principles, types of sifters. Flour treatment and quality assessment. Rheology of dough and batters.

UNIT- 2

(HOURS: 20)

Wheat: Types, milling, flour grade, flour treatments (bleaching, maturing), flour for various purposes, Products and By-products.

Rice: Physicochemical properties, milling (mechanical & solvent extraction), parboiling, ageing of rice, utilization of by products.

Rye and triticale: milling (flour), uses. Corn – Milling (wet & dry), cornflakes, corn flour.

Barley: Milling (pearl barley, barley flakes & flour, Malting and brewing.

Oats: Milling (oatmeal, oat flour & oat flakes).

Sorghum and millets: Traditional & commercial milling (dry & wet).

UNIT- 3

(HOURS: 8)

TECHNOLOGY OF PULSES

Milling of pulses, Dry milling, Wet milling, and Improved milling method.

UNIT- 4

TECHNOLOGY OF OILSEEDS

(HOURS: 20)

Oil seeds Processing: Groundnut, Mustard, Soybean, Sunflower, Safflower, Sesame and other oil seeds processing. Extraction of oil and refining. Extraction methods: rendering, expression, solvent extraction. Processing: degumming, refining, bleaching, deodorization, fractionation, winterization, hydrogenation, interesterification, esterification, emulsification, stabilization. Sources of protein (defatted flour, protein concentrates and isolates), properties and uses, protein texturization, fiber spinning.

UNIT- 5

(HOURS: 10)

Spoilage: oxidative and hydrolytic rancidity – chemistry, prevention - use of antioxidants. Manufacture of frying oils, margarine, and mayonnaise. Byproducts of fats and oils industry and their uses.

Books Recommended

- Bent A, Bennion EB & Bamford GST. 1997. The Technology of Cake Making. 6th Ed. Blackie.
- Jackson EB. 1999. Sugar Confectionery Manufacture. 2nd Ed. Aspen Publ.
- Junk WR & Pancost HM. 1973. Hand Book of Sugars for Processors. Chemists and Technologists. AVI Publ.
- Manley DJR. 1983. Technology of Biscuits, Crackers, and Cookies. Ellis Horwood.
- Matz SA. 1992. Bakery Technology and Engineering. 3rd Ed. Chapman & Hall.
- Pomeranz Y. 1987. Modern Cereal Science and Technology. MVCH Publ.

FST-303: DAIRY TECHNOLOGY (CREDITS: 4)

CLO1: (0.15) To know the need and importance of dairy industries

CLO2: (0.20) To know the compositional and technological aspects of milk

CLO3: (0.25) To learn about the unit operation used in milk processing

CLO4: (0.15) Students will have a thorough understanding of processing and preservation of milk

CLO5: (0.25) To impart the importance of various milk based products, its standard specification and various defects found in them.

Theory

UNIT-1

(HOURS: 15)

Milk: production statistics, importance, standards, Definition, composition and nutritive value of milk, Factors affecting composition of milk; buying and collection of milk; cooling and transportation of milk; analyses at different levels; transportation. Physico-chemical properties of milk; microbiology of milk; milk and public health; clean milk production; special milks.

UNIT-2

(HOURS: 10)

Unit operations in milk processing: cream separation, bacto-fugation, filtration, thermization, standardization, homogenization, pasteurization, sterilization, UHT, aseptic packaging, storage, distribution, effect on milk constituents.

UNIT-3

(HOURS: 20)

Technology, composition, nutritive value, process of manufacture, defects - their causes and prevention of Milk products: evaporated, condensed and powder milks, butter, yogurt, cheese, ice cream.

UNIT-4

(HOURS: 15)

Indigenous milk products: khoa, gulabjamun, burfi, rabri, paneer, dahi, lassi, kheer, desi ghee etc. Milk by-products: Definition; classification; composition; principle of utilization; methods of utilization.

Books Recommended

Aneja RP, Mathur BN, Chandan RC & Banerjee AK. 2002. Technology of Indian Milk Products. Dairy India Publ.

De S.1980. Outlines of Dairy Technology. Oxford Univ. Press. Henderson JL. 1971. Fluid Milk Industry. AVI Publ.

Rathore NS et al. 2008. Fundamentals of Dairy Technology - Theory & Practices. Himanshu Publ
Spreer E. 1993. Milk and Dairy Products. Marcel Dekker.

Walstra P. 1999. Dairy Technology. Marcel Dekker.

Walstra P. (Ed.). 2006. Dairy Science and Technology. 2nd Ed. Taylor & Francis.

Web BH, Johnson AH & Lford JA. 1987. Fundamental of Dairy Chemistry. 3rd Ed. AVI Publ.

FST-304: FOOD FERMENTATION TECHNOLOGY (CREDITS: 4)

CLO1: (0.15) To provide students understanding of the origin of fermentation processes, its history and media formulation

CLO2: (0.25) To give a comprehensive knowledge of the concepts of fermentation processes

CLO3: (0.20) To understand the various factors that impact fermentation processes

CLO4: (0.25) To understand the technology and processing involved in purification and extraction of various industrially important fermented products

CLO5: (0.15) To acquaint students with the various microorganisms involved in different types of value added fermented food products

Theory

UNIT-1

(HOURS: 10)

History of fermentation. Introduction to fermentation processes, Media formulation and process optimization.

UNIT-2

(HOURS: 20)

Concepts of basic mode of fermentation processes: Bioreactor designs; Types of fermentation and fermenters; Concepts of basic modes of fermentation- Batch, fed batch and continuous; Conventional fermentation v/s biotransformation; Solid substrate, surface and submerged fermentation; Fermentation economics; Fermentation media; Fermenters design- mechanically agitated; Pneumatic and hydrodynamic fermenters; Large scale animal and plant cell cultivation and air sterilization; Upstream processing: Media formulation; Sterilization; Aeration and agitation in bioprocess; Measurement and control of bioprocess parameters; Scale up and scale down process.

UNIT-3

(HOURS: 15)

Downstream processing: Bioseparation - filtration, centrifugation, sedimentation, flocculation; Cell disruption; Liquid-liquid extraction; Purification by chromatographic techniques; Reverse osmosis and ultra filtration; Drying; Crystallization; Storage and packaging; Treatment of effluent and its disposal.

UNIT-4

(HOURS: 15)

Microorganisms used in food fermentation: Types of cultures, starter cultures: maintenance, propagation and activation of cultures. Fermented Foods-types, methods of manufacture for vinegar, sauerkraut, tempeh, miso, soya sauce, bakery foods and traditional Indian foods.

Food related fermentations: Microbial biomass, Single cell protein, baker's yeast and enzyme production.

Books Recommended

Stanburry P.P. and Whitaker, A. 1984. Principles of Fermentation Technology. Pergamon Press, Oxford UK.

Steinkraus, K.H. 1983. Handbook of Indigenous Fermented Foods. Marcel Dekker, New York.

Biely, J.E. and Ollis D.F. Bio Chemical Engineering Fundamentals (1986) McGraw Hills.

Moo-young M. Comprehensive Biotechnology Vol. 1-4 Pergamon Press Oxford.

Nagodawithana T & Reed G. 1993. Enzymes in Food Processing. Academic Press.

Tucker GA & Woods LFJ. 1991. Enzymes in Food Processing.

Whitehurst R & Law B. 2002. Enzymes in Food Technology. Blackwell Publ.

FST-305: FOOD PROCESS ENGINEERING (CREDIT: 4)

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- CLO1: (0.15)** To provide basics of Food Engineering.
CLO2: (0.20) To impart knowledge of engineering approach in material handling
CLO3: (0.15) To teach different Engineering units and their dimensions
CLO4: (0.25) To understand all the engineering properties of packaging materials
CLO5: (0.25) To impart basic knowledge of Milling, its equipment and different methods used
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Theory

UNIT-1

(HOURS: 10)

Introduction : Dimensions – Primary and Secondary, Engineering Units – Base units, Derived units and supplementary units, System – State of a system, extensive and intensive properties, Density – Solid, Particle and Bulk density, Concentration, Temperature, Pressure, Enthalpy, Power and area Phase diagram of water.

UNIT-2

(HOURS: 15)

Food engineering: Introduction, trends, Physical, mechanical, biological, thermal and rheological properties of Agricultural raw materials.

Engineering approach in materials handling: cleaning, sorting, grading, size reduction - equipments and their applications. Storage structures: refrigeration, air conditioning and freezing units. Mobile refrigeration units. Equipments used for packing of fruits, vegetables and their products. Extraction process for agricultural products: oil seeds, fruits.

UNIT-3

(HOURS: 15)

Milling: crushing efficiency, Methods of Milling, Milling Equipment, Milling Equipment for Solid Foods, Milling Equipment for Liquid Foods (Emulsification and Homogenization), Efficiency of Milling, Methods of Separation

Storage: direct damages; indirect damages; traditional and modern storage structure; storage of agricultural perishables.

UNIT-4

(HOURS: 10)

Heat transfer in food: heat measurement, transfer and control; steam and its use in industry.

Applications of refrigeration and freezing: principles, insulation, cold storages - design, equipment, applications. Sterilization, evaporation, drying, pasteurizes.

UNIT-5

(HOURS: 15)

Engineering properties of packaging materials: diffusion through membrane, gas permeation mechanism. **Materials handling:** equipments. Energy for food engineering: steam, fuel utilization, electric power utilization, Boilers, steam generators, retorts, fans, blowers: types, selection. Thermodynamic laws, energy balance for open systems, dynamic response of sensors.

Books Recommended

- Keith, W. 2007. Handbook of waste management and co-product recovery in food processing, Vol. I. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.
- Ramaswamy, H.S. and Marcotte, M. 2005. Food processing: principles and applications. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.
- Smith, J.S. and Hui, Y.H. 2004. Food processing: principles and applications. Blackwell Pub. Co., Oxford, England.
- Pandey, H., Sharma, H.K., Chauhan, R.C., Sarkar, B.C. and Bera, M.B. 2004. Experiments in food process engineering. CBS Publishers, New Delhi, India.
- Sahay, K.K. and Singh, K.K. 2001. Unit operations of agricultural processing. Vikas Pub. House, New Delhi, India.
- Barbosa-Canovas, G.V., Fito, P. and Ortega-Rodriguez, E. 1997. Food engineering 2000, Springer Verlag, Heidelberg, Germany.
- Farrall, W. 1993. Engineering for dairy and food products. John Wiley & Sons Inc., New York, USA.

FST 306: Practical –III (CREDITS: 4)

CLO1: (0.15) To give them comprehensive demonstration of Sophisticated instrument and estimation of different parameters using them

CLO2: (0.25) To provide them thorough understanding of milling of cereal grains, their grading and all tests for quality assessment related to them

CLO3: (0.25) To impart knowledge of all the platform tests of milk along with physico- chemical and microbiological analysis

CLO4: (0.20) To study the development of different fermented drinks and fermented products.

CLO5: (0.15) To study different instrument related to heat transfer, pasteurization and selection of pumps.

INSTRUMENTAL TECHNIQUES IN FOOD ANALYSIS LAB

Practical

Demonstration of HPLC and GC for analysis of bioactive compounds, antioxidant, pesticides, fatty acids etc. Estimation of food components using UV-VIS spectrophotometer.

Determination of organic acids by chromatography.

Visit to food testing /NABL laboratory.

CEREAL, PULSES AND OILSEED TECHNOLOGY

Practical

Grading of grains. Milling of cereal grain through different mills. Tests for flour quality assessment. Visit to wheat, maize and rice processing industries. Determination of gluten content in refined wheat flour.

Extraction of oils and fats. Determination of physical and chemical constants: color, cold test, melting point, smoke point, specific gravity, solid fat index, refractive index, acid value, peroxide value, iodine value, saponification value. Visit to oil and fat industries.

DAIRY TECHNOLOGY LAB

Practical

Milk sampling methods.

Reception tests: Sensory test, sedimentation, pH, acidity; lactometer reading, clot on boiling, alcohol test. Preparation of flavored milk and milk products. Physico-chemical and microbiological analysis of milk and milk products.

Tests for adulterants.

Visit to commercial dairy farms and milk processing plants.

FOOD FERMENTATION TECHNOLOGY

Practical

Production of Baker's Yeast

Development of a fermented food/drink utilizing plant products /animal products or by products as substrate

Media formulation and sterilization

Study of fermentation of pulses and millets

Study of dough raising power of yeasts

Production of fermented products viz. sauerkraut, idli, curd etc.

FOOD PROCESS ENGINEERING

Practical

Study of pasteurizers, Study on heat exchangers and determination of overall heat transfer coefficient of shell and tube heat exchangers. Visit to cold stores and freezing units.

Colloigative properties, Selection/design of pumps and fans using characteristic curves. Heat transfer in foods. Mass transfer. Size reduction and screening. Refrigeration. Freezing. Food storage, Milling.

SEMESTER- IV

FST-401:TECHNOLOGY OF BEVERAGE, PLANTATION CROPS AND SPICES (CREDITS: 4)

CLO1: (0.15) To impart the importance of various fermentation methods used for beverage preparation for respective flavor development

CLO2: (0.20) To understand different types of beverage and their processing

CLO3: (0.25) To provide complete knowledge of different plantation crops with their processing and preservation techniques

CLO4: (0.15) To teach the extraction method of different spices with their usage

CLO5: (0.15) To learn about processing techniques used in tea, coffee and cocoa production.

Theory

UNIT-1

(HOURS: 10)

Beverage industry in India. Beverages: classification – still, carbonated, alcoholic. Beverage ingredients: water, fruit components, sweeteners, flavorings, colorings, preservatives. Manufacture of soft drinks: mixing, pasteurization, homogenization, filling, packing and storage. Carbonation: History, CLO2, gas volume.

UNIT-2

(HOURS: 10)

Soft drinks: ingredient specifications, manufacturing problems, changes in color, appearance, flavor. Packaging: types, interactions. Shelf life Issues: microbiological problems.

Bottled water: legislation, water treatment, filling, quality issues.

Fermented beverages: introduction, types, role of microorganisms. Regulations and standards. Statuary requirement: labeling, nutrition claims.

UNIT-3

(HOURS: 15)

Tea Processing: Chemical composition and processing of tea. Processing of instant tea.

Coffee Processing: Structure of coffee cherry, Dry and wet processing of coffee cherry. Roasting, Grinding, Brewing of coffee beans, Spray and Freeze drying of coffee. Manufacture of Instant coffee, monsooned coffee and decaffeinated coffee. Coffee-chicory mixture.

UNIT-4

(HOURS: 10)

Cocoa processing: Fermentation of cocoa beans, processing of cocoa beans. Manufacture of cocoa products- chocolate, cocoa powder & cocoa butter, drinking cocoa, instant cocoa, drinking chocolate. Sugar bloom and fat bloom in chocolates.

UNIT-5

(HOURS: 15)

Processing of Plantation crops: Processing of Cashew nuts, Cashew-apple juice, Cashew-apple juice, Almonds, Almond oil, Peanuts, Peanut oil, Peanut butter, Dates, Date products, Saffron, Figs, Apricots (dried, canned frozen), Raisins, Plums. Their uses.

Processing of Spices: Definition, Processing of Spices, and Extraction of essential oils and oleoresins from spices, Spice products. Processing and uses – Pepper, Small Cardamom, Black Cardamom, Ginger, Chilies, Turmeric, Asafoetida, Aniseeds, Cloves.

Books Recommended

- Ashurst, P.R. and Hargitt, R. 2009. Soft drink and fruit juice problems solved. Woodhead Publishing. Ltd., Abington, Cambridge, UK.
- Shachman, M. 2000. The soft drinks companions: A technical handbook for the beverage industry. CRC Press Taylor & Francis Group, Boca Raton, Florida, USA.
- Varnam, H.A. and Sutherland, J.M. 1999. Beverages: technology, chemistry and microbiology. CRC Press Taylor & Francis Group, Boca Raton, Florida, USA.

FST-402: BAKERY, CONFECTIONERY AND EXTRUDED FOODS (CREDITS: 4)

CLO1: (0.20) The course provides sciences behind bakery product.

CLO2: (0.15) The course will provide basic functions of all the ingredients used in different products

CLO3: (0.15) To know about technologies used in Chewing gum and chocolates.

CLO4: (0.25) To provide thorough knowledge of all the instruments used in bakery and confectionary

CLO5:(0.25) Students will get complete knowledge of functions of extruders along with the different extruded products

Theory

UNIT-1

(HOURS: 15)

Science of bakery product: Raw materials: grains, milling; grades of flours; types of flours – Chorleywood bread flour, patent, soft, whole meal, brown and low moisture flours; leavening agents; flour treatments; fats; emulsifiers; colors; flavors; antioxidants; sugars; dairy ingredients; gums and gelling agents. Bread making: chemistry of dough development, making of bread, types of breads. Products other than bread: pastry, biscuits, wafers, cakes and other chemically leavened products.

UNIT-2

(HOURS: 15)

Confectionery: significance, classification, industries in India. Sugar confectionery: ingredients, manufacturing - high boiled sweets, caramel, toffee, fudge, gums. Sugar free confectionery: need, ingredients, manufacture. Chewing gum technology. Chocolate, confectionery.

UNIT-3

(HOURS: 15)

Snack foods: history, status, manufacture - potato, nuts, cereal, meat and fish based. Puffed and baked snacks. Seasonings: ingredients, formulations, applications. Quality control. Packaging. Production of breakfast cereals. Feed and industrial uses of cereals.

UNIT-4

(HOURS: 15)

Extruded foods: Objectives and importance of extrusion in food product development; Components and functions of an extruder; Classification of extruder; Advantages and disadvantages of different types of extrusion; Change of functional properties of food components during extrusion; Pre and post extrusion treatments; Use of extruder as bioreactor; Manufacturing process of extruded products.

Books Recommended

- Edward, W.P. 2007. The science of bakery products. The Royal Society of Chemistry, Cambridge, UK. UK.
- Hui, Y.H., Corke, H., Leyn, I.D. and Cross, N. 2006. Bakery product science and technology. Blackwell Pub. Co., London, UK.
- Khetarpaul, N., Grewal, R.B. and Jood, S. 2005. Bakery science and cereal technology. Daya Pub. House, New Delhi, India.
- Riaz, M.N (ed). 2003. Extruders in food applications. Technomic Pub. Co. Inc., Lancaster, Pennsylvania, USA.
- Guy, R. 2001. Extrusion cooking technology and applications. Woodhead Publishing Ltd., Abington, Cambridge, UK.

FST- 403:FOOD PACKAGING TECHNOLOGY (CREDITS: 4)

CLO1: (0.25) To provide comprehensive overview of the scientific and technical aspects of food packaging.

CLO2: (0.15) To instill knowledge on packaging machinery, systems, testing and regulations of packaging.

CLO3: (0.15) To impart the effect of various environmental factors on the stability of food.

CLO4: (0.20) To develop comprehensive understanding of different packaging tests.

CLO5 : (0.25) To know the importance of selective packaging related to food products.

Theory

UNIT-1

(HOURS: 15)

Introduction: Importance, definition and function of food packaging, types of packaging materials, Glass (construction of jars and bottles, optical, thermal and mechanical properties of glass), Metal (types of base metal sheets, construction of metal cans, lacquering), Plastics- substituted olefins, tetrafluoro ethylene, PET, polyamides, polyesters.

UNIT-2

(HOURS: 10)

Packaging tests: tensile strength, compression, bursting, tear and impact test for packages, integrity testing of packages, cushioning effect on packaged foods, deterioration of packaged foods, shelf life calculation for packaged foods. Permeability of multilayer materials.

UNIT-3

(HOURS: 15)

Manufacturing of packaging materials: glass containers, metal cans/open top cans, plastic materials, aseptic packaging, vacuum and inert gas packaging. **Modern packaging concepts:** form-fill-seal system, aseptic packaging technique, retort packaging for long life foods, modified atmosphere packaging, active and intelligent packaging. Current use of novel packaging techniques. Labelling, bar coding in packaging, packaging and environment. Edible packaging of foods. Biodegradable plastics, recycling of used packaging materials.

UNIT-4

(HOURS: 20)

Selective packaging: Important considerations in packaging of fruits and vegetables, meat, fish and poultry, milk and dairy products, cereal and bakery products.

Books Recommended

Lee, D.S., Yam, K.M and Piergiovanni, L. 2008. Food packaging science and technology. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.

EIRI (Engineers India Research Institute). 2007. Handbook of packaging technology. Engineers India Research Institute, New Delhi, India.

Robertson, G.L. 2006. Food packaging: principles and practices. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.

FST-404: FOOD PRODUCT DEVELOPMENT (CREDITS: 4)

CLO1: (0.25) To introduce students to the food product development process, design, development and commercialization

CLO2: (0.20) To understand the role of consumers in the development of a new food product.

CLO3: (0.25) To give a comprehensive knowledge about the entire process of product development, the factors affecting the success, failure and marketability of a food product.

CLO4: (0.15) To know the ethics of food production and consumption

CLO5:(0.15) To understand the cases of various new products launched in the market and understand the reactions of customers to them through case study

Theory

UNIT-1

(HOURS: 10)

Food product development: process, strategy, design, development, commercialization, evaluation. Key to new product success and failure.

UNIT-2

(HOURS: 10)

Consumer in food product development: consumer behavior, food choices, sensory needs, consumer role. Preference mapping and food product development: conducting trials, analyzing, recent developments.

UNIT-3

(HOURS: 15)

Case study of consumer-oriented food product development: reduced-calorie foods - Consumer trends and healthy eating, marketing and technological challenges, success factors.

Case study: reduced-calorie on-the-go beverages. The ethics of food production and consumption.

UNIT-4

(HOURS: 25)

Concept of product development: product success and failure, factors for success, process of product development, managing for product's success. Innovation strategy - possibilities for innovation, building up strategy, product development programme.

The product development process - product strategy, product design and process development, product commercialization, product launch and evaluation.

Recommended Books

1. Earle, M., Earle, R. and Anderson, A. 2001. Food product development. Woodhead Publishing Ltd., Abington, Cambridge, UK.
2. Earle M. and Earle, R. 2007. Case studies in food product development. Woodhead Publishing Ltd., Abington, Cambridge, UK.
3. Frewer, L and Trijp, H. 2007. Understanding consumers of food products. Woodhead Publishing Ltd., Abington, Cambridge, UK.

FST-405: STATISTICS AND DATA ANALYSIS (CREDITS : 4)

CLO1. The students will be exposed to various research methods and statistical tools required.

CLO2. to analyze the experimental data in food research and industry.

CLO3. The focus will be on providing knowledge related to research process, data collection and data analysis etc.

Theory

UNIT-1

(HOURS: 15)

Scientific Approach to Research: Meaning, significance, variables

Research Process: Formulating the problem, objectives, hypothesis, Experimental design, sample design, collecting data, analysis of data, interpretation, and preparation of report.

UNIT-2

(HOURS: 15)

Sampling Techniques: Probability and non probability sampling. Experimental designs: Randomized Block design.

UNIT-3

(HOURS: 15)

Measurements: measurement scale, Frequency distribution, graphical presentation of data. Measures of Central Tendency: Mean median and mode, their uses.

UNIT-4

(HOURS: 15)

Measures of variability: Mean deviations, Quartile deviation, standard deviation, their uses. Correlation: Spearman and Pearson's techniques of correlation, Linear regression.

UNIT-5

(HOURS: 15)

Tests of significance of difference between means: t-test, F-test, One way ANOVA. Applications to food quality assessments

Books Recommended

Aggarwal BL. 2003. Basic Statistics. New Age.

Kothari CR. 1989. Research Methodology. Wiley Eastern.

Gupta SP. 2004. Statistical Methods. S. Chand & Sons

FST-406: PRACTICAL –IV (CREDITS: 4)

CLO1: (0.15) To understand water treatment analysis.

CLO2: (0.15) To prepare different carbonated beverages along with their analysis.

CLO3: (0.25) To study all the bakery equipments and preparation of different baked products.

CLO4: (0.20) To analyze different packaging parameters and determination of shelf life and film thickness.

CLO5: (0.25) To impart thorough knowledge of all the steps required for the development of a new product.

TECHNOLOGY OF BEVERAGE, PLANTATION CROPS AND SPICES

Practical

Water treatment and analysis. Formulation and preparation of carbonated beverages. Analysis of beverages: chemical, microbiological, sensory. Manufacture of fermented beverages .Visit to beverage industries. total solids; moisture and volatile oil content of spices; detection of microbial quality and adulteration in spices; aromatic compounds in spices; capsaicin content, curcumin content of turmeric; storage and packaging of spices; visit to spice processing Units.

BAKERY, CONFECTIONARY AND EXTRUDED FOODS LAB

Practical

Study of bakery equipments

Quality test for wheat flour used in the baked products. Maltose Number, Water Absorption, Sedimentation value, Alcohol Acidity.

Preparation and quality evaluation of bread/bun/pizza.

Preparation and quality evaluation of noodles.

Preparation and quality evaluation of puffs.

Preparation and quality evaluation of cakes

Preparation and quality evaluation of biscuits

Preparation and quality evaluation of nan khatai

Preparation and quality evaluation of cookies

Effect of syrup consistency and temperature on the quality characteristics of hardboiled sweets

Preparation and quality evaluation of chocolate. Visit to bakery and confectionery industries.

FOOD PACKAGING TECHNOLOGY LAB

Practical

Packaging tests: tensile strength, compression, bursting, tear and impact test for packages, Requirements of foods for specific packaging material. Can testing. Determination of shelf-life in various packaging materials. Determination of film thickness. Visit to packaging industries.

FOOD PRODUCT DEVELOPMENT

Practical

Food product development projects - strategy, design, development, commercialization, launch and evaluation. Practical aspects and sensory evaluation techniques. Chemical and instrumental quality analysis.

SEMESTER- V

FST- 501: MEAT, POULTRY & FISH TECHNOLOGY (CREDITS: 4)

CLO1: (0.25) To impart the complete understanding of compositional and technological aspects of meat, poultry and fish.

CLO2: (0.15) To provide their sources and importance in national economy.

CLO3: (0.15) To study the chemical and microscopic structure of meat

CLO4: (0.20) To provide different processing techniques used in meat, poultry and fish based products.

CLO5 : (0.25) To give students a basic knowledge about methods of slaughtering & meat Processing.

Theory

UNIT-1

(HOURS: 15)

Introduction: Sources of meat and meat products in India, its importance in national economy. Per capita consumption of meat, poultry and fish. Present status of meat, poultry and fish industries in India. Chemical composition and microscopic structure of meat.

UNIT-2

(HOURS: 25)

Methods of slaughtering & meat processing- Pre-slaughter care, Ante mortem inspection of meat animals. Methods of stunning, slaughtering and dressing of meat animals and poultry birds Post mortem examinations of meat-Rigor mortis. Factor affecting post mortem changes, properties and shelf life of meat. Methods of meat tenderization. Meat curing- types and factors affecting quality of cured meats. Preparation of smoked meats, pickled meats, sausages and hamburgers. Methods of meat preservation-refrigeration, thermal processing and dehydration.

UNIT-3

(HOURS: 15)

Egg processing: Structure, composition, nutritive value and functional properties of eggs. Grading of eggs. Factors affecting egg quality and measures of egg quality. Preservation of eggs by different methods- freezing, dehydration and coating.

UNIT-4

(HOURS: 15)

Fish products: Types of fish, composition, structure, post mortem changes in fish. Handling of fresh water fish. Nutritional quality of fish. Preservation of fish by drying, salting, curing, freezing, canning, fish spoilage, shellfish, fish products; fish meal, fish flour, fish oils.

Books Recommended

Kerry, J., Kerry, J. and Ledward, D. 2007. Meat processing: improving quality. Woodhead Publishing Ltd., Abington, Cambridge, England.

NIIR Board of Consultants and Engineers. 2005. Preservation of meat and poultry products. Asia Pacific Business Press Inc., Kalma Nagar, Delhi.

Riaz, M.N. and Chaudry, M.M. 2003. Halal food production. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.

Mead, G.C. 2004. Poultry meat processing and quality. Woodhead Publishing Ltd., Abington, Cambridge, UK.

Long, A. 2008. Fish processing technology. Cyber Tech. Publications. New Delhi, India.

Ninawe, A.S. and Rathnakumar, K. 2008. Fish processing technology and product development. Narendra Publishing House, New Delhi, India.

Bremner, H.A. 2005. Safety and quality issues in fish processing. Woodhead Publishing Ltd., Abington, Cambridge, UK.

Hall, G.M. 2001. Fish processing technology. Blackwell Pub Co., Cambridge, UK.

FST-502: FOOD QUALITY, STANDARDS AND REGULATIONS (CREDITS: 4)

CLO1: (0.20) To learn about the objectives and need of quality in food products

CLO2: (0.25) To acquaint with food quality parameters, adulteration and control systems, in a food industry

CLO3: (0.15) To give students a basic knowledge about food labeling and its parameters

CLO4: (0.15) To provide students a deep understanding about the various food standards, laws and regulations,

CLO5: (0.25) Students will have a thorough understanding of concept of hygiene considerations and sanitation in during food processing.

Theory

UNIT-1

(HOURS: 15)

Introduction: Concept, objectives and need for quality, difference between quality control and quality assurance, method of quality control.

Food adulteration: adulterants, health hazards, methods of detection.

UNIT-2

(HOURS: 15)

Food labeling: Perspectives on nutrition labeling, food labeling logo. Islamic food laws and regulations: sources, principles, lawful foods, unlawful foods. **Food quality management:** history, importance, systems.

UNIT-3

(HOURS: 20)

Food laws: Objectives, requirements and benefits of food standards (FSSA, PFA, BIS, AGMARK, FPO and FDA), FPO standards for fruits and vegetable products.

Food Safety Management Systems (FSMS) – ISO22000:2005. Codex Alimentarius Commission (CAC) guidelines for food quality management, PAS99 series- their objectives and principles.

UNIT -4

(HOURS: 20)

Hygiene Considerations: General Hygiene and sanitation in food industry, Good manufacturing practices (GMP): personal cleanliness, buildings and facilities, sanitary operations, sanitary facilities and controls, equipment and utensils, production and process control, warehousing and Distribution, traceability and recall. Hazard analysis and critical control points (HACCP) system: history, prerequisites, preliminary steps, principles.

Books Recommended

CAC (Codex Alimentarius Commission). 2007. Codex Alimentarius Commission – Procedural manual. Joint FAO/WHO Food Standards Programme. FAO, Rome, Italy.

ISO (International Standards Organization). 2005. Food safety management systems – requirements for an organization in the food chain. Case Postale, Geneva, Switzerland.

Lelieveld, H.L.M., Mostert M.A. and Holah, J. (Editor). 2005. Good manufacturing practices in the food industry. In: Handbook of hygiene control in the food industry. Woodhead Publishing Ltd., Abington, Cambridge, UK.

Blanchfield, J.R. 1998. Good manufacturing practices. Institute of Food Science and Technology, London, UK.

FST-503: BUSINESS MANAGEMENT AND ENTREPRENEURSHIP (CREDITS: 4)

CLO1: Understand the meaning and concept of entrepreneurship development.

CLO2: Sensitized and oriented towards identifying entrepreneurial opportunities and market potential.

CLO3: Gain knowledge setting up of an enterprise and its management.

CLO4: To provide thorough knowledge of accounting and finance.

Theory

UNIT-1

(HOURS: 20)

Accounting and Finance: Taking decision on starting a venture; Assessment of feasibility of a given venture/new venture; Approach a bank for a loan; Sources of financial assistance; Making a business proposal/Plan for seeking loans from financial institution and Banks; Funds from bank for capital expenditure and for working; Statutory and legal requirements for starting a company/venture; Budget planning and cash flow management; Basics in accounting practices: concepts of balance sheet, P&L account, and double entry bookkeeping; Estimation of income, expenditure, profit, income tax etc.

UNIT-2

(HOURS: 20)

Marketing: Assessment of market demand for potential product(s) of interest; Market conditions, segments; Prediction of market changes; Identifying needs of customers including gaps in the market, packaging the product; Market linkages, branding issues; Developing distribution channels; Pricing/Policies/Competition; Promotion/ Advertising; Services Marketing.

Negotiations/Strategy: With financiers, bankers etc.; With government/law enforcement authorities; With companies/ Institutions for technology transfer; Dispute resolution skills; External environment/ changes; Crisis/ Avoiding/ Managing; Broader vision–Global thinking

UNIT-3

(HOURS: 15)

Information Technology: How to use IT for business administration; Use of IT in improving business performance; Available software for better financial management; E-business setup, management.

Human Resource Development (HRD): Leadership skills; Managerial skills; Organization structure, pros & cons of different structures; Team building, teamwork; Appraisal; Rewards in small scale set up.

UNIT-4

(HOURS: 15)

Fundamentals of Entrepreneurship: Support mechanism for entrepreneurship in India

Role of knowledge centre and R&D: Knowledge centers like universities and research institutions; Role of technology and upgradation; Assessment of scale of development of Technology; Managing Technology Transfer; Regulations for transfer of foreign technologies; Technology transfer agencies. Funding agencies in India: schemes, loans.

ELECTIVE COURSE FST 504: NUTRACEUTICALS AND FUNCTIONAL FOODS (CREDITS: 4)

CLO1: (0.25) To develop comprehensive understanding of different nutraceutical and functional foods.

CLO2: (0.20) To provide knowledge about different types of nutraceutical compounds and their food sources.

CLO3: (0.15) To understand the potential of various functional foods in promoting human health.

CLO4: (0.15) To learn about fabrication and formulation of different functional foods.

CLO5:(0.25) To understand the legal aspects about the stability, safety, consumer acceptance, marketing and regulatory issues of nutraceutical and other functional foods

Theory

UNIT 1

(HOURS: 10)

Introduction: Background, status of nutraceuticals and functional food market, definitions, difference between nutraceuticals and functional foods, types of nutraceutical compounds and their health benefits, current scenario.

UNIT 2

(HOURS: 15)

Nutraceuticals: Types of nutraceutical compounds – Photochemical, phytosterols and other bioactive compounds, peptides and proteins, carbohydrates (dietary fibers, oligosaccharides and resistant starch), prebiotics, probiotics and symbiotic, lipids (Conjugated Linoleic Acid, omega-3 fatty acids, fat replacers), vitamins and minerals; their sources and role in promoting human health.

UNIT 3

(HOURS: 20)

Functional Foods :Cereal and cereal products, Milk and milk products, egg, oils, meat and products, sea foods, nuts and oilseeds, functional fruits and vegetables, herbs and spices, beverages (tea, wine etc), Fermented foods – their health benefits and role in conditions like cardiovascular diseases, hypertension, diabetes etc. Future prospects of functional foods and nutraceuticals and their potential for use in improving health. Development in processing of functional foods. Formulation and fabrication of functional foods.

UNIT 4

(HOURS: 10)

Legal Aspects : Stability of nutraceuticals. Safety, Consumer acceptance and assessment of health claims, labeling, marketing and regulatory issues related to nutraceuticals and functional foods.

Elective Course: FST- 505: TEA PLANTATION TECHNOLOGY (CREDITS: 4)

-
- CLO1: (0.25)** To provide the knowledge about historical background of cultivation of tea.
CLO2: (0.25) To impart complete understanding of manufacturing of different types of tea.
CLO3: (0.15) To learn the potential of tea in promoting human health.
CLO4: (0.20) To understand quality analysis of different varieties of tea.
CLO5: (0.15) To study different tea based products.
-

Theory

UNIT-1 (HOURS: 15)

History of tea: Historical background of tea cultivation, Geographical locations of tea in world, Tea growing countries, Classifications of tea, objectives and importance of tea Science.

Tea Botany: Botanical description and classifications of tea. Tea agro types, Taxonomical position of tea. Vegetative and reproductive parts of tea plant; life cycle and growth pattern of tea.

UNIT-2 (HOURS: 25)

Clinical Effect of Tea: Tea's role in cardiovascular health, Tea's role in Cancer risk reduction, Tea's role in oral health, Tea and reduced risk of kidney stone, Tea and reduced risk of osteoporosis.

Manufacture of Black Tea: Quality analysis of green leaf; Principle Stages of Processing. Physical and Chemical withering of tea; Effect of withering on quality of tea; Biochemical changes during withering.

Orthodox vs. un-orthodox manufacture: Leaf conditioning, CTC Process. Biochemical changes during fermentation, factors affecting fermentation; Methods of fermentation, Hygienic control.

Drying: Types of dryer, factors considering during drying, drying time, Sorting & Grading, Storage & Packaging, Recovery percentage.

UNIT-3 (HOURS: 10)

Tea Tasting: tasting of liquor and testing terminology. Manufacture and characteristics of Black tea, Green tea & semi-fermented tea. Quality control of Tea.

UNIT-4 (HOURS: 18)

Tea Processing: Present status of tea processing in India & Abroad. Recent advances in tea processing technology. Prospects of future growth in tea processing in India. Factors affecting quality parameters; physical, chemical and rheological tests, quality evaluation and grading of tea.

Tea aroma precursors; tea flavor; tea grades; storing of tea. Tea concentrates, decaffeinated tea, flavored tea; herbal tea, instant tea manufacture.

Books Recommended

Banerjee, B. *Tea Production and Processing*. Oxford & IBH Pub. Co., 1st Edition, 1993.

References

Jain, N.K. *Global Advances in Tea Science*. Aravali Books International, 1st Edition, 1999.

Varnam AH & Sutherland JP. *Beverages: Technology, Chemistry and Microbiology*. Chapman & Hall. 1994.

Elective Course: FST- 506: FOOD BIOTECHNOLOGY AND TOXICOLOGY (CREDITS: 4)

CLO1: (0.25) To provide students the fundamentals and application of biotechnology in relation to food processing, food fermentations,

CLO2: (0.25) To acquaint with application of micro-organisms for the production of Industrial products with particular reference to foods and food ingredients.

CLO3: (0.20) To gain an understanding of microbial, chemical and natural toxicants and allergens those are indigenously present and developed during food processing.

CLO4:(0.15) To learn about toxicity of water

CLO5(0.15) To provide understanding about the systems for food safety surveillance with an aim of producing safe food, assess risk and develop detoxification strategies for the same

Theory

UNIT-1

(HOURS: 10)

Biotechnology: introduction, history. Microbial metabolism. Developments in metabolic and biochemical engineering: metabolites, range of fermentation processes, components of fermentation processes. Isolation and preservation of industrially important microorganisms.

UNIT-2

(HOURS: 20)

Industrial fermentations: media, design and types of fermentors, process variables in fermentation, recovery, purification of fermentation products. Production of organic acids, enzymes, amino acids, single cell proteins, carotenoids and fermented food products. Microbial genetics: conjugation, transduction, transformation. GMO in food biotechnology. Legal and social aspects of food biotechnology.

UNIT-3

(HOURS: 20)

Toxicology: definition, dose-response, absorption, translocation, storage excretion, food toxicology. Toxicity by naturally occurring food toxins: plant origin – accidental toxicity, haemagglutinins, goitrogens, cyanogens, lathyrogens, others; animal origin – honey, quail, eggs, milk, meat, fish. Toxicity by extraneous chemicals: agricultural chemicals, food processing, packaging, additives, adulterants. Toxicity from water.

UNIT-4

(HOURS: 10)

Microbial toxins: mycotoxins – moulds, mushrooms.

Bacterial food intoxication; bacterial food infections.

Food allergy and intolerance.

Systems for food safety surveillance – GMP, TQM, HACCP and FSMS-ISO22000:2005.

Books Recommended

El-Mansi, F.M.T, Bryee, C.F.A, Demain, A.L. and Allman, A.R. 2007. Fermentation microbiology and biotechnology. CRC Press, Taylor & Francis Group, Boca Raton, Florida, USA.

Shetty, K., Paliyath, G, Pometto, A. and Levin, RE. 2005. Food Biotechnology. Marcel Dekker Inc., New York, USA.

Borem, A., Santos, F.R. and Bowen, D.E. 2004. Understanding biotechnology. Pearson Education Inc., New Jersey, USA.

Awan, J.A. and Anjum, F.M. 2010. Food toxicology. Unitech Communications, Faisalabad, Pakistan.

Shibamoto, T and Bjeldanes, L. 2009. Introduction to food toxicology, 2nd ed. Academic Press, London..

CAC (Codex Alimentarius Commission). 2007. Codex Alimentarius Commission – Procedural manual. Joint FAO/WHO Food Standards Programme. FAO, Rome, Italy.

ISO (International Standards Organization). 2005. Food safety management systems – requirements for an organization in the food chain. Case Postale, Geneva, Switzerland.

FST-507: PRACTICAL –V (CREDITS: 4)

CLO1: (0.25) To give students practical knowledge about the various processing technologies of meat, poultry and fish products.

CLO2: (0.25) To impart knowledge regarding safety and quality standards that need to be maintained in a food processing industry

CLO3: (0.15) To teach students about the steps and the procedure of auditing and the important documents to be maintained during the process

CLO4: (0.15) To give a comprehensive knowledge about the practicality of setting up a new business and entrepreneurship development.

CLO5: (0.20) Visit to different industries of meat, fish and poultry.

MEAT, POULTRY & FISH TECHNOLOGY

Practical

1. Fish, Meat cutting and handling.
2. Dressing of poultry.
3. Evaluation of the quality of meat, poultry and fish,
4. Canning, freezing, dehydration cured product of fish and meat.
5. Meat based soup and its quality control.
6. Measures of egg quality, egg powder etc.
7. Analysis of fish and fish products.
8. Fish protein concentrate uses.
9. Visit to meat/ fish /poultry processing industries.

FOOD QUALITY STANDARDS AND REGULATIONS

Practical

To conduct Hazard Analysis & Risk Assessment of identified hazards

Determination of CCP through CCP Decision Tree

Formation of CCP Monitoring Checklist

Identification of PRP's (GHP & GMP) of food plant

Preparation of detail flow diagram of manufacturing process & identification of potential hazards of food at each step/process

Preparation of sample pages of Quality Manual

Preparation of sample pages of Management System Procedure (MSP)

Preparation of sample pages of Standard Operating Procedure (SOP)

Preparation of sample pages of Formats for Quality Management System

Preparation of on-site audit plan

Preparation of an Audit Checklist /Observation Sheet

To conduct Document Review (Adequacy Audit) before Audit

To conduct opening meeting of audit

To conduct Closing Meeting

Preparation of Audit Plan Schedule before an Internal Audit

To conduct an Audit Meeting before conducting Internal/External Audit

Preparation of Corrective /Preventive Action Recommendation for the organization after Audit (Report Writing)

Preparation of report by audited after correction of non-conformities

To conduct audit Follow-up

BUSINESS MANAGEMENT AND ENTREPRENEURSHIP

Practical

Case Study

Candidates should be made to start a, mock paper company, systematically following all the procedures.

- The market analysis developed by them will be used to choose the product or services.

A product or service is created in paper and positioned in the market. As a product or services available only in paper to be sold in the market through the existing links. At this juncture, the pricing of the product or the service needs to be finalized; linking the distribution system until the product or services reaches the end consumer.

Candidates who have developed such product or service could present the same as a project work to the Panel of Experts, including representatives from industry sector. If the presented product or service is found to have real potential, the candidates would be exposed to the next level of actual implementation of the project. Go to any venture capital website (like sequoiacap.com) and prepare a proposal for funding from venture capital.

1. Elective Course: NUTRACEUTICALS AND FUNCTIONAL FOODS

PRACTICAL

1. Identification of various nutraceuticals and functional foods available in the market
2. Preparation and evaluation of carotenoid enriched food.
3. Preparation and evaluation of lycopene enriched food.
4. Preparation and evaluation of dietary fiber content in cereals and their products
5. Preparation and evaluation of anthocyanins in food sample
6. Preparation and evaluation of probiotic/prebiotic foods

3. Elective Course: TEA PLANTATION TECHNOLOGY

Practical

Morphological study: Root, stem, leaf, flower and fruit of tea.

Anatomical study: Root, stem, leaf, flower of tea. Identify the different tea variety through the external characteristics.

Phyto-chemical analysis of tea; Preparation of iced and flavoured tea beverage; Visit to relevant processing units.

2. Elective Course: FOOD BIOTECHNOLOGY AND TOXICOLOGY

Practical

Isolation, purification and maintenance of yeast and bacterial cultures. Aerobic and anaerobic fermentation and production of various fermented food products. Determination of survival curves using physical and chemical mutagens.

Protocol for detection & quantification of toxins in food, Detection of pesticide residues, antibiotic residues, hormones and veterinary drugs, & heavy metals; Analysis of microbial & plant toxins; Immunoassays.

SEMESTER- VI

FST-601: INDUSTRIAL TRAINING & REPORT WRITING (CREDITS: 12)

CLO1: (0.20) To expose the students to actual working environment and enhance their knowledge and skill from what they have learned in the college

CLO2: (0.15) To instill the good qualities of integrity, responsibility and self confidence

CLO3: (0.25) To enhance students' familiarity with the world of work and enable them to reflect constructively in issues related to work

CLO4: (0.25) To develop employability skills, intellectual skills, core of key skills, personal attributes and

CLO5: (0.15) To develop knowledge about how organizations work.

Each student shall undertake project work assigned to him related to the area of food technology, either in a food Industry or in the department, under the supervision of a faculty member. Industrial project/training will include study of food processing and preservation industries- raw materials used, unit operations and processes involved in processing of different types of food products and their environmental issues. The work will be allotted specifying the different aspects to be carried out by the student. Weekly progress report has to be submitted by each student (in the prescribed format) to the supervisor/course teacher whether undergoing industrial training or departmental project work. At the end of the semester the student will submit a final report on his work. Preparation, submission and presentation of the report (3 Hard copies of report and a soft copy of report and presentation)

**Note:* Students have to be physically present for the presentations related to Project work thrice during the course of semester VI.

FST-602: SEMINAR (CREDIT: 2)

CLO1: (0.25) To provide platforms for practicing professional communication techniques and skills

CLO2: (0.25) To offer chances to debate issues related to the respective topics, share experiences and exchange perspectives

CLO3: (0.25) To provide chance for in depth study on a particular topic

CLO4: (0.25) To increase their presentation skills as well as confidence

The seminar, on any topic pertaining to food technology, would involve:

- Exhaustive literature review, comprising of at least 100 references, based on various reputed journals (peer reviewed), conference proceedings, latest books, etc.
- Preparation, submission and presentation of a review paper (1 Hard copy of paper and a soft copy of paper and presentation).
- Secondary data analysis and its interpretation to bring out the finding and
- Preparation, submission and presentation of the seminar report (3 Hard copies of seminar report and a soft copy of seminar report and presentation).

FST-603: PROJECT / DISSERTATION (CREDITS: 4)

CLO1: (0.35) The main objective of Project and viva voice is to inculcate Research interest among students

CLO2: (0.35) To mentor students to design and conduct original and ethical research.

CLO3:(0.30) To carry out projects which help to improve lifestyle of local people

Objectives – To mentor the students to design and conduct original and ethical research. They should be able to write a dissertation in the APA format. The research done can either be empirical/data based (quantitative, qualitative, or mixed-methods) or it can be in the form of a critical review of research and theory.

RECOMMENDED READINGS:

APA manual for dissertation

Evaluation: Viva jointly by one internal and one external examiner.

Elective Course: FST-604: AROMATIC AND MEDICINAL PLANT (CREDITS: 4)

CLO1: (0.20) To provide complete understanding of flavors , their composition and method of extraction

CLO2: (0.15) To impart knowledge of biogenesis of flavor in food

CLO3: (0.25) To identify different sources of off flavors and their corrective methods

CLO4: (0.15) To teach the scope and importance of crude drugs and their processing

CLO5: (0.25) To get full description of the analysis phytochemicals and their applications.

Theory

UNIT:1

(HOURS: 15)

Sources of flavors (natural, processed and added), Flavor composites (natural, semi-synthetic and synthetic). Biogenesis of flavours in food – natural and processed foods (Maillard Reaction and Lipid Oxidation).

UNIT-2

(HOURS: 20)

Analysis of flavors (Subjective and objective); Formulations of flavors, adulteration, Flavor emulsions, Flavors production in fermented foods, Off-flavors in foods. Odor recognition and thresholds tests; Analysis of different types of flavors such as whole and powdered spices, essential oils, oleoresins, synthetic flavors, plated and dispersed spices-general tests, tests of limited application and specific tests; sensory analysis of flavors; monitoring flavors during food processing; preparation of flavor emulsions and their stability; study of off-flavors in different foods.

UNIT-3

(HOURS: 15)

Crude Drugs: Scope & Importance, Classification (Taxonomical, Morphological Chemical, Pharmacological); Cultivation, Collection & processing of Crude Drugs. Cultivation and Utilization of Medicinal & Aromatic Plants in India.

UNIT-4

(HOURS: 25)

Analysis and Types of Phytochemicals: Methods of Drug evaluation (Morphological, Microscopic, Physical & Chemical). Preliminary screening, Assay of Drugs – Biological evaluation / assays, Microbiological methods. Carbohydrates & derived products; Glycosides - extraction methods (*Digitalis*, *Aloe*, *Dioscorea*); Tannins (Hydrolysable & Condensed types); Volatile Oils - extraction methods (Clove, *Mentha*); Alkaloids - extraction methods (*Taxus*, *Papaver*, *Cinchona*); Flavonoids-extraction methods, Resins- extraction methods.

Applications of Phytochemicals: Application of phytochemicals in industry and healthcare; Biocides, Biofungicides, Biopesticides.

Elective Course: FST-605: FOOD HYGIENE AND SANITATION (CREDITS: 4)

CLO1: (0.20) To study design of plant and processing equipment.

CLO2: (0.25) To develop comprehensive understanding of waste product handling and management.

CLO3: (0.25) To understand cold chain management

CLO4: (0.15) To learn about the designing of warehouse storage

CLO5: (0.15) To provide technologies used in ETP Plant manufacturing

Theory

UNIT:1

(HOURS: 15)

Food Plant Layout and Equipment Design

General principles of food plant Design and layout, Design of food processing equipments: Size Reduction, mixing, separation, extraction, filtration, centrifugation, distillation and, gas absorption equipments.

UNIT:2

(HOURS: 20)

Warehousing and Cold Chain Management

Food hygiene and safety in transportation, with a focus on warehouse storage and refrigerated ships-Safe food storage at shopping outlets: use of coolers/chillers/freezers, length of time in storage, design of warehouses.

Scope of Cold Chain for enhancing marketing potentials of perishables in domestic and international markets.

Principles of Cold Chain Creation and Management. Physicochemical changes in stored products during storage Air tight, Non-air tight, Underground, Conventional & Modern storage structures for fruits, vegetables, meat and marine products. Aerated, refrigerated and controlled atmospheric storage. Layout and Design of storage structures, economics of storage structures

UNIT- 3

(HOURS: 25)

Food Plant Hygiene and Sanitation

Waste disposal, Control methods using Physical and Chemical Agents, Pest and Rodent Control, ETP Design and Layout. Food storage sanitation, transport sanitation and water sanitation.

By-products utilization obtained from dairy plant, egg & poultry processing industry and meat

Industry. Wastewater and solid waste treatment: Waste-types-solid and liquid waste characterization, physical, chemical, biological, aerobic, anaerobic, primary, secondary and tertiary (advanced) treatments.

Books Recommended:

1. Norman G. Marriott and Robert B. Gravani. (2006). Principles of Food Sanitation, 5th edition
2. Rao, D. G. (2010). Fundamentals of Food Engineering, PHI learning Private Ltd.
3. Fellows P. (2000). Food Processing Technology, 2nd Edition. Woodhead Publishing Limited and CRC Press LLC
4. James A (2013) The supply chain handbook, distribution group.
5. FAO, US (1984) Design and operations of cold store in developing

FST-606: PRACTICAL –VI (CREDIT:2)

CLO1: (0.15) To teach techniques of sensory analysis of various aromatic compounds and flavours.

CLO2: (0.25) To provide knowledge regarding unsuitable flavours in different foods.

CLO3: (0.15) To provide practical knowledge regarding designing of a food processing plant, warehouse or cold storage.

CLO4: (0.25) To impart knowledge regarding the analysis of effluents, sanitizers, disinfectants.

CLO5: (0.20) To understand and study the effluent treatment and sanitization facility required in a food processing industry

Elective Course: AROMATIC AND MEDICINAL PLANT

Practical

Odor recognition and thresholds tests, Analysis of different types of flavors such as whole and powdered spices, essential oils, oleoresins, synthetic flavors, plated and dispersed spices-general tests. Sensory analysis of flavors; monitoring flavors during food processing.

Preparation of flavor emulsions and their stability. Study of off-flavors in different foods.

Elective Course: FOOD HYGEINE AND SANITATION

PRACTICAL

Design and layout of various food processing systems and food service areas. Design and layout of cold storage and warehouse. Determination of physico-chemical properties of wastewater.

Preparation of a sanitation schedule for food preparation area. Testing of sanitizers and disinfectants.

Study of Phenol coefficient of sanitizers. Determination of BOD (biological oxygen demand)/ COD in waste water. Study of waste water treatment system/ETP.

HVP 760: FUNDAMENTALS OF HUMAN VALUES AND PROFESSIONAL ETHICS

[Non-Credit Compulsory Course]

CLO1. To introduce the students about the importance of human values and professional ethics.

CLO2. To understand the ethical concerns in professional and personal space.

Unit-1: Ethics and Human Values

(HOURS: 15)

Definition, Importance and Relevance in present-day Society.

Indian Constitutional Values: Fundamental Rights and Duties; Freedom, Equality, Fraternity, Justice; Directive Principles of State Policy.

Religious and Cultural Values: Values embedded in different religions; Religious Tolerance.

Unit-2: Basic Human Virtues

(HOURS: 15)

Concept of Honesty, Punctuality, Responsibility, Courtesy, Discipline, Courage, Compassion, Empathy and Restrain

Family responsibilities: Duties as a Member of the Society, Guidance to youngsters; Gender Equality.

Social Concerns: Evils of Dowry & Caste System, Racial Discrimination, Suicidal Tendencies, Substance Abuse and Addiction.

Unit-3: Introduction to Professional Ethics

(HOURS: 15)

Need, Importance and Goals; Ethical Values in Different Professions: Dignity of Labour, Respect for Authority, Code of Conduct, Conflicts of Interest.

Occupational Crime; Sexual and Mental Harassment in work place.

Professional Rights: Employee Rights, Intellectual Property Rights (IPR).

Unit-4: Ethics in Professional and Global Space

(HOURS: 15)

Cyber Ethics and Etiquette.

Correct and Judicious use of Mobile Phones/electronic gadgets, Social Networking in professional space.

Environmental Ethics; Ethics in Research.

Books Recommended

Jayashree Suresh and B S Raghavan- *Human Values and Professional Ethics: Values and Ethics of Profession*. S Chand, 2005.

Martin, Clancy, Wayne Vaught, and Robert Solomon (eds.)- *Ethics Across the Professions: A Reader for Professional Ethics*. Oxford: Oxford University Press, 2010.

R.R. Gaur, R. Sangal and G.P. Bagaria- *A Foundation Course in Human Values and Professional Ethics* (Paperback). Excel Books, 2010

Terrence M. Kelly- *Professional Ethics: A Trust-Based Approach*. Lexington Books, 2018.

R. S. Naagarazan- *Professional Ethics and Human Values*. New Age International (Second ed.), 2019.

*ON LINE COURSE (OLC)		
Any Two through MOOCS available on NPTEL / SWAYAM		
OLC 1:	Thermal Operations in Food Process Engineering: Theory and Applications	(NPTEL)
OLC 2:	Thermal Processing of Foods	(NPTEL)
OLC 3:	Fundamentals of Food Process Engineering	(NPTEL)
OLC 4:	Food Microbiology and Safety	(SWAYAM)
OLC 5:	Food laws and standards	(SWAYAM)
OLC 6:	Food and Nutrition	(SWAYAM)
OLC 7:	Food Microbiology	(SWAYAM)
OLC 8:	Food Preservation Technology	(SWAYAM)
OLC 9:	Food Safety and Quality Control	(SWAYAM)
OLC 10:	Food Chemistry	(SWAYAM)

*These online courses which are already available on NPTEL / SWAYAM are broadly equivalent to courses of Food Science & Technology in terms of content and Credit hours.

7. Teaching learning processes:

The teaching learning processes incorporate a variety of modes and a regular use of ICT. These are listed below:

1. **Classroom Teaching** for topics which are intensely information-based. This is a very regular feature of all the courses in Food Science and Technology.
2. **Power Point slides** for topics which involve information related to working of machine, process and intricate biological pathways such as metabolic pathways in bacteria and other microorganisms. Use of Power Point presentations are also made whenever the lectures are to be summarized in a crisp and point wise manner to highlight salient / important conclusions from the topics.
3. **Classroom Discussions** are a regular feature while teaching. The students are drawn into impromptu discussions by the teacher during the process of teaching.
4. **Video Displaying**, both real-time and animations are used for topics which require 3D dimensional viewing of the biological mechanisms to drive the point home. These have proved to be very helpful while teaching. These are also used to convey complexities of antigen-antibody interactions and generation of antibody diversity during the teaching of Immunology, Toxicology and Biochemistry.
5. **Model Making** is also used especially for understanding and building a perception of the students for the structures of viruses which cannot be seen by a light microscope and can be seen only under expensive equipment like electron microscopes.
6. **Laboratory Practical** are an integral part of every course included in UG programme in Food Science and Technology. This is also a daily affair for UG students of Food Science and Technology.
7. **Problem Solving** is encouraged during the laboratory work.
8. **Group Activity** as well as discussions with the laboratory supervisor/ among the students themselves/ Mentor is also encouraged during laboratory work.
9. **Project Work** is included in the programme where students work individually or in groups to design experiments to solve/answer a problem suggested by the Mentor or identified by the students in consultation with the Mentor. The students are mentored regularly during the duration the project is in progress.
10. **Presentations** by the Students are regularly done. The students are mentored in presentation of data, interpretation of data and articulation with the students/teachers/Research Scholars during their presentation.
11. **Presentation** by Experts in different specialties of Food Microbiology, Food Fermentation and Technology and Food Processing are arranged to broaden the horizons of the students.
12. **Interaction** with Experts is also encouraged during/after presentations to satisfy/ignite

curiosities of the students related to developments in the different areas of Food Science and Technology.

13. **Visit to Industries/Laboratories** related to Food Science and Technology like fermentation, food etc. are organized to acquaint the students with real-life working environments of the professional Food Technologist, Nutritionist and Microbiologist with a view to broaden their perspective of the subject of Food Science and Technology.

8. Assessment Tasks:

It is important that the students of UG Food Science and Technology program achieve the desired results in terms of the learning outcomes to be professionally sound and competitive in a global society. Achieving the desired learning outcomes is also imperative in terms of job employment leading to a happy and prosperous individual further leading to a happy and prosperous family and thereby a happy and prosperous society or nation. The assessments tasks are pivotal to get an authentic feedback for the teaching learning process and for mid-course corrections and further improvements in future. The assessment tasks are carried out at various stages of the duration of the UG Food Science and Technology programme like Mid-term assessments, End-term assessments, Semester examinations, Regular assessments, viva-voce etc. The assessment tasks are listed below:

1. **Multiple Choice Questions (MCQ)** are one of the predominant form of assessment tasks. This task is used during all kinds of term and semester examinations.
2. **Short-Answer Questions** during term and semester examinations are used to assess the ability of the student to convey his thoughts in a coherent way where prioritization of the information in terms of their significance is tested.
3. **Surprise Quizzes** are regularly used during continuous assessment while the teaching learning process is continuing which prepares the student to quickly recall information or quickly analyze a problem and come up with proper solutions.
4. **Visual/Pictorial Quizzes** are used to sharpen the comprehension of the students after looking at all the components of a system.
5. **Impromptu Opinions** on microbiological problems are sought from student during regular teaching learning which help them to think quickly in a given context. This helps build their ability to come up with solutions to problems which the students might not have confronted previously.
6. **Problem Solving** question are generally given during the laboratory work.
7. **Data Interpretation** is also another assessment task which is used to develop analytical skills of the students. This assessment is used during laboratory work as well as during conduction of project work.
8. **Analytical Skills** are assessed during work related to several experiments like enzyme kinetics, growth of bacteria and bacteriophages, mutation frequencies.
9. **Paper/ Project** presentations are used to assess the articulation skills of the student. These are carried out both during the duration of the teaching learning processes as well as during end-Semester examinations.
10. **Report Writing** is used to assess the keenness of the students for details related to microbiology while visiting laboratories / industries as students invariably are required to submit a report after such visits.
11. **Assignment Writing** are used to assess the writing abilities of the students during midterm vacations.
12. **Viva-voce** during the laboratory working hours and during laboratory examination are used to assess the over-all knowledge and intelligence of the students.

9. **Key Words:** Food Science and Technology , Teaching, Learning outcomes, Curriculum, Curriculum Framework, Programme outcomes, Course outcomes, UG Programme, Undergraduate programme, Teaching learning processes, Assessment Tasks, Evaluation Tasks, Online Courses, MOOCS, NPTEL, SWAYAM, UGC, India, Higher Education Institutions, HEI

Learning Based Curriculum Framework

LOCF

For M.Sc Biotechnology

2021 - 2022



(School of Biological Sciences)

Department of Applied Biology

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Preamble

It's strange to know that most of the educated people regardless of gender are unaware of the importance of biotechnology in any aspects of our society, even though it is crystal clear that its technological value has foreseen for a long time to motivate the upcoming generations. It is certain that human existence and survival on the coming days rest on the development and rapidly advancement of biotechnology.

The advancement of thorough researched and development has brought the importance of biotechnology to existence. It is a field in biology that is extensively used in engineering, medicine, science and technology, agriculture and other valuable form of applications. Biotechnology can be a great solution to mankind struggles. It is merely an applied principles of chemistry, physics and engineering comprise into biological structure.

Application in modern era includes the field of genetic engineering. It is the usage of this technology to culture cells and tissues for the modification living organism for human purposes. By this, the importance of biotechnology in agriculture increases the crop production which makes it double or even higher than normal harvest. It has the ability to give biological protection from disease and pests, so a minor necessity for chemical insecticides. Biotechnology is capable of conveying genetic qualities of the crops that can withstand the changing climate condition, obtain an increase of nutritional qualities. This will provide the farmers a healthy lifestyle due to the less exposure of chemical residues and eventually give a higher profit.

Benefits of biotechnology can also be experienced in the medical institution. Its technological application includes pharmaceutical products and medicines, and human therapy. It helps produced large quantity of protein for nutritional supplements and insulin for diabetic patient treatment. The gene therapy, in which is the most successful result of biotechnology research use to cure aids and cancer.

Application on biotechnology can be seen in industrial plant and factories. They are used to give an improved effectiveness and competence in production process while reducing the impact to the environmental issues. Waste products can be treated and recycled as a help to preserve natural resources.

It is beyond expectation on what the biotechnology has accomplished and reached in just a matter of time. Humanity has just start to comprehend and recognized the endless opportunities it has open. As technology assures to provide solution to every frightening problem we face every now and then, so is mankind is expecting a more develop biotechnology in the future. A technology that is more reliable and firm. This is the importance of biotechnology; revolution of the future technology.

1. Introduction

Biotechnology is an innovation that depends on the concept of Biological Sciences and Engineering & Technology, which uses life forms to create products for the improvement of human lives as well as the biosphere. **Master of Science (M. Sc.) in Biotechnology** is a two-year programme, divided into four semesters that deals with the application of science and technology to alter living or non-living materials for the generating knowledge, services and products. M.Sc. in Biotechnology concentrates on Biology and Chemistry alongside the basic principles of the design and engineering to meet life's most prominent needs in a deliberately managed manner.

This programme imparts vital information regarding Biotechnology that cultivates critical thinking and basic reasoning abilities to make the students ready to take charge on working on a different plan and rectify difficulties.

Since Biotechnology is a multidisciplinary subject, the scope of Biotechnology has expanded diverse sciences like immunology, virology and other subjects like health agriculture, cell biology, plant physiology, seed technology.

Some topics in the Core courses may overlap with a similar discipline specific elective (DSE) courses. However, the DSE courses, in greater detail, provide opportunities for hands on relevant training, exposure visits, skill development and project work.

Several courses may be supplemented by MOOCs through the e-Pathshala programme of the UGC.

The LOCF for M.Sc. Biotechnology has been prepared as per the structure provided by the UGC, however, the multidisciplinary nature of the subject and the field application of knowledge has been emphasized. Biotechnology encompasses many disciplines and so revision and amendments are inevitable, however, any modification must keep the spirit of CBCS and LOCF intact.

2. Learning outcomes based approach to Curriculum Planning

Domain knowledge, academic outlook, critical approach and thinking, ethical attitude, professional aptitude, adaptability, self-learning, problem solving ability, teamwork performances, and employability are the basis of the learning outcomes based curriculum. The learning outcomes are the ingredients based on which the graduate attributes, qualification descriptors, programme learning outcomes are determined. This also facilitates in curriculum planning and development as well as in the delivery and review of academic programmes.

2.2 Nature and extent of M.Sc. Biotechnology

M.Sc. Biotechnology (CBCS) is introduced under the faculty of Biological Sciences. The course is designed to provide wider career options and increased employability of the students. In CBCS, the major change is a shift from the traditional marking system to a grading system. It provides an opportunity for the students to choose from the prescribed courses comprising core, elective (generic and discipline specific) or skill based courses according to their learning needs, interests, and aptitude.

Biotechnology is an interdisciplinary course that involves use of biological systems in product development. The principal aim of this program is to introduce the students to classical and modern concepts in biology and its applications in research. This program provides a hands on basic and comprehensive grounding in multidisciplinary science of modern and classical biomedical science. The most unique feature in M.Sc. Biotechnology is the year long project work/dissertation that a student can undertake from the third semester along with course-work. The final semester is dedicated to the project work. The project work provides a strong foundation for a career in innovation and advanced research competency.

2.2 Aims of M.Sc Biotechnology

The basic aims of M. Sc. Biotechnology is to produce competent Biotechnologist's who can employ and implement their knowledge base in premium processes and applications which will profoundly influence or utilized for existing paradigm of agriculture, industry, healthcare and restoration of degraded environment to provide sustainable competitive edge to present society. This programme mainly focuses to

- develop a detailed technical understanding of the key methods used in the contemporary biotechnology sector
- appreciate the techniques applied in biotechnology and advanced research
- acquire and critically appraise new data arising from the use of these techniques and to interpret the implications of such data
- develop an understanding of the commercial, financial and regulatory context in which the biotechnology sector operates
- The objective of the Master's Programme in Biotechnology is to equip the students to apply knowledge of living organisms and their cellular processes, classification and interaction among themselves, with physical and chemical agents and higher order organisms.

- The laboratory training in addition to theory is included to prepare them for careers in the industry, agriculture, and applied research where biological system is increasingly employed.
- Basics and current molecular updates in the areas of Industrial Biotechnology, Fermentation Technology, Agriculture and Environmental Biotechnology are included to train the students and also sensitize them to scope for research.
- The Masters in Biotechnology Programme will address the increasing need for skilled scientific manpower with an understanding of research ethics involving living organisms to contribute to application, advancement and impartment of knowledge in the field of Biotechnology.
- The study of Master of Biotechnology will impart in-depth understanding of basic aspects of Biotechnology pertaining to industrial applications that will make the students ready to contribute to:
 - Better awareness of the major issues at the forefront of the discipline.
 - Will possess an in-depth understanding of the area of Biotechnology chosen for research emphasis.
 - Awareness of ethical issues in Medical, clinical and animal research and careers options and develop inclination towards own professional goals over a wide range of carrier options expanding from R & D, industrial or Govt. Sector or as an Entrepreneur.

3. Qualification descriptors for M.Sc. Biotechnology

The qualification descriptors for the M.Sc. programme in Biotechnology shall be five learning attributes such as disciplinary knowledge & understanding; skills & techniques; national and global competencies; communication; and application. The key qualification descriptor for the programme shall be strong foothold of the basic scientific theories and principles as well as critical thinking and decision making. The major expected learning outcomes of the M.Sc. programme in Biotechnology should include the following:

Knowledge & Understanding

- *Demonstrate* extensive and systematic acquaintance of the disciplinary foundation in the various areas of Biotechnology.

- *Insightfully* address the contemporary research and development at both national and international arena.
- *Understand and engage* in the field of Biotechnology and its allied areas.

Skills & Techniques

- *Show* ability to apply scientific knowledge & experimental skills in critical and organized manner.
- *Demonstrate* the ability to identify the role of the scientific knowledge, experimental skills, scientific methods & tool in dealing with real life case specific issues and formulate sustainable solutions.

Competence

- *Communicate* heterogeneous audience through his or her information, knowledge and arguments effectively and professionally with write-ups and presentations in both national and international perspectives.
- *Ability* to work as proactive and supportive member in a team through substantial contributions towards effective planning, management, and implementations of projects and/or tasks.
- *Exhibit* capability to think and execute independent research ventures/projects.
- *Capability* to identify his or her own strengths and limitations; develop an attitude to learn more; inculcate a lifelong learning practice; and grow as pragmatic knowledge seekers as well as knowledge creators.

4. Graduates Attributes

Graduates Attributes (GAs) are composed of independently measurable outcomes that signify the capabilities and potentials of the graduate to attain accomplishment and perform in adequate manner at appropriate situations. The Graduate Attributes of M.Sc Biotechnology are given as below:

GA1. Erudition of acquaintance: Gain in-depth knowledge and understandings of each discipline or professional area across boundaries of nations with an aptitude to identify, access, analyze and synthesize existing and new knowledge, and integrate them for enrichment of knowledge.

GA2. Analytical Thinking: Critically to address multifaceted scientific issues; pertain independent decision for synchronizing information to formulate innovative and intellectual advances towards focused research over wider theoretical and practical domains.

GA3. Problem Solving: Address and solve scientific problems through rational and original thinking; keep updates of different solution avenues and select appropriate options considering public health and societal factors.

GA4. Application of modern tools: Select, learn and apply appropriate techniques, resources, sophisticated instruments and models and mitigate different activities with a thorough understanding of drawbacks.

GA5. Mutual and Multidisciplinary competence: Develop sound knowledge and perception about group dynamics, recognize role of individuals in a group, take initiatives and leadership in collaborative-multidisciplinary and **trans-disciplinary** scientific research, demonstrate a capacity for self-management and teamwork, timely decision-making through openness and flexibility, constructive arguments and rational analysis for achieving common goals and objectives.

GA6. Communication skill: Communicate scientific/technological knowhow and new learning to the scientific community and the society at large with strong conviction and confidence so that humanity benefit from the knowledge and technological development. This can be achieved through sound technical proficiency of graphics, software, writing skill, in-depth subject specifics knowledge, by maintaining appropriate standards, by the ability to render as well as receive comprehensible instructions.

GA7. Life-long Learning: Distinguish the importance and possess the ability to prepare and engage in life-long learning process; also have the ability to transfer the acquired skills in other domains of science; which can be achieved through enthusiasm and commitment to improve knowledge and competence in a continued manner.

GA8. Ethical values and Social Responsibility: Attain strong academic integrity, professional code of conduct, ethics of experimental research and scientific writings, contemplation of the impact of research findings on conventional practices, and a clear sense of responsibility towards societal needs and reaching the targets for attaining inclusive and sustainable development.

GA 9. Futuristic attitude: Ability to recognize and address current scenarios, scientific and technological progress, lifestyle change, and biophysical evolutions with a futuristic view; practicing intuitiveness and interest towards scientific prediction via application of basic knowledge of science.

5. PROGRAM LEARNING OUTCOMES OF M.SC. BIOTECHNOLOGY

The following program outcomes have been identified for **M.Sc. Biotechnology**

PLO1	Ability to recognize the need for learning the topic and develop foundational knowledge on the topic
PLO2	Ability to develop critical thinking and problem solving skills to solve interdisciplinary issues related to the topic
PLO3	Ability to understand the relationships between natural and man-made systems
PLO4	Ability to apply statistical methods, ICT and innovative techniques in classroom, field and laboratory to analyze scientific data
PLO5	Ability to develop lifelong learning and professional skills
PLO6	Ability to design and execute a scientific project, write scientific reports, develop research and communication skills
PLO7	Ability to spread awareness about the environment around us, sustainable development and conduct outreach activities
PLO8	Ability to gain empirical knowledge on the topic and contribute in decision making processes

6. PROGRAMME STRUCTURE OF M.SC. BIOTECHNOLOGY

Total Credits: 88 credits

Structure of M.Sc. Biotechnology

Course category	No. of courses	Credits per course	Total credits
I. Core Courses (Including Project in Semester IV)	15	16,16,16&16 (For Semester I,II,III & IV respectively)	64
II. Discipline Specific Courses (DSE)	2	4&4 (For Semester III & IV respectively)	8
III. Multi Disciplinary Courses (MDC)	2	4&4 (For Semester III & IV respectively)	8
IV. Skill Enhancement Courses (SEC)	2	4&4 (For Semester I & II respectively)	8
Total Credits			88

6.1 Semester wise distribution of course

Course Code: MBT

School Code: SOBS

Course Code	Title	Credit	Nature of the Course (T/P)	Marks Allotted		
				Internal	End Semester	Total
SEMESTER-I						
MBT 101	Cell and Developmental Biology (CC-1)	4	T	30	70	100
MBT 102	Biochemistry (CC-2)	4	T	30	70	100
MBT 103	Microbiology (CC-3)	4	T	30	70	100
MBT 104	Bioinstrumentation (SEC-1)	4	T	30	70	100
MBT 105	Practical on Cell Biology, Biochemistry & Microbiology (CC-4)	4	P	30	70	100
Total		20	-	150	350	500
SEMESTER-II						
MBT 201	Molecular Biology (CC-5)	4	T	30	70	100
MBT 202	Immunology (CC-6)	4	T	30	70	100
MBT 203	Genetics (CC-7)	4	T	30	70	100
MBT 204	Biostatistics, Bioethics and IPR (SEC-2)	4	T	30	70	100
MBT 205	Practical on Molecular Biology, Immunology and Genrtics(CC-8)	4	P	30	70	100
Total		20	-	150	350	500
SEMESTER-III						
MBT 301	Genetic Engineering (CC-9)	4	T	30	70	100
MBT 302	Plant and Animal Biotechnology (CC-10)	4	T	30	70	100
MBT 303	Omics and Bioinformatics (DSE-1)	4	T	30	70	100
MBT 304	Food and Industrial Biotechnology (CC-11)	4	T	30	70	100
MBT 305	Practical on Genetic Engineering, Plant, Food and Industrial Biotechnology (CC-12)	4	P	30	70	100
MBT 306	Pharmacology (MDC-I)	4	T	30	70	100
Total		24	-	150	350	500
SEMESTER-IV						
MBT 401	Environmental Biotechnology (CC-13)	4	T	30	70	100
MBT 402	Research Methodology (DSE-2)	4	T	30	70	100
MBT 403	Practical on Environmental Biotechnology (CC-14)	4	P	30	70	100
MBT 404	Dissertation Work and Lab. Visit Report (CC-15)	8	P	60	140	200
MBT 405	Entrepreneurship, IPR, Bioethics and Biosafety (MDC-II)	4	T	30	70	100
HVP-740	Human Values and Professional Ethics	NCM*	T	15	35	50
Total		24	-	165	385	550

*NCM: Non Credit Mandatory

CC: Core Courses;

MDC: Multidisciplinary Course;

SEC: Skill Enhancement Courses;

DSE: Discipline Specific Elective

CORE COURSES

- | | |
|--------------------------------------|-----------------------------------|
| 1. Cell and Developmental Biology | 2. Biochemistry |
| 3. Microbiology | 4. Molecular Biology |
| 5. Immunology | 6. Genetics |
| 7. Genetic Engineering | 8. Plant and Animal Biotechnology |
| 9. Food and Industrial Biotechnology | 10. Environmental Biotechnology |

MULTIDISCIPLINARY COURSE (any one in semesters-III; to be opted by other Department under the School)

1. Pharmacology
2. Food Processing and Preservation Technique

SKILL ENHANCEMENT COURSES (any one per semester in semesters 3-4)

1. Bioinstrumentation
2. Biostatistics, Bioethics and IPR
3. Industrial Fermentations

DISCIPLINE SPECIFIC ELECTIVES (Any paper per semester in semesters 3-4)

1. Omics Bioinformatics
2. Research Methodology
3. Intellectual Property Rights
4. Evolutionary Biology

6.2 List of courses

A. Core Courses

Semester		Lecture (L)	Tutorial (T)	Practical (P)	Contact Hour	Credits
I	Cell and Developmental Biology (CC-1)	4	0	0	4	4
	Biochemistry (CC-2)	4	0	0	4	4
	Microbiology (CC-3)	4	0	0	4	4
	Practical on Cell Biology, Biochemistry & Microbiology (CC-4)	0	0	4	8	4
II	Genetic Engineering (CC-9)	4	0	0	4	4
	Plant and Animal Biotechnology (CC-10)	4	0	0	4	4
	Food and Industrial Biotechnology (CC-11)	4	0	0	4	4
	Practical on Genetic Engineering, Plant, Food and Industrial Biotechnology (CC-12)	0	0	4	8	4
III	Genetic Engineering (CC-9)	4	0	0	4	4

	Plant and Animal Biotechnology (CC-10)	4	0	0	4	4
	Food and Industrial Biotechnology (CC-11)	4	0	0	4	4
	Practical on Genetic Engineering, Plant, Food and Industrial Biotechnology (CC-12)	0	0	4	8	4
IV	Environmental Biotechnology (CC-13)	4	0	0	4	4
	Practical on Environmental Biotechnology (CC-14)	4	0	0	4	4
	Dissertation Work and Lab. Visit Report (CC-15)	0	0	0	8	8

B. Discipline Specific Course

Semester		Lecture (L)	Tutorial (T)	Practical (P)	Contact Hour	Credits
III	Omics and Bioinformatics (DSE-1)	4	0	0	4	4
IV	Research Methodology (DSE-2)	4	0	0	4	4

C. Skill Enhancement Course

Semester		Lecture (L)	Tutorial (T)	Practical (P)	Contact Hour	Credits
I	Bioinstrumentation (SEC-1)	4	0	0	4	4
II	Biostatistics, Bioethics and IPR (SEC-2)	4	0	0	4	4

D. Multi Disciplinary Course

Semester		Lecture (L)	Tutorial (T)	Practical (P)	Contact Hour	Credits
III	Pharmacology (MDC-I)	4	0	0	4	4
IV	Entrepreneurship, IPR, Bioethics and Biosafety (MDC-II)	4	0	0	4	4

Note:

- 1. Institutes may offer more courses for C and D category of courses without compromising the philosophy of LOCF*
- 2. The core courses are mandatory courses listed as 'A' category.*
- 3. The B, C and D category of courses may not necessarily be from the parent department/institute/college as they are courses of CBCS nature*

6.3. Assessment Implementation Plan

Stagewise assessment plan will be adopted through a repetitive and systematic approach. The main purpose of planning the assessment process is to evaluate that methods of assessing the learners are suitable with respect to each program learning outcome. This will also help the respective faculty/school to analyse the performance of the students to the desired standards;

To revise vis-à-vis refine the assessment criteria; and also to make necessary alterations in the programme in a liberal manner. It is also expected that the respective faculty would adopt rubrics as part of the appraisal process. The rubrics would define what is expected and what will be assessed, and would detail the criteria; creating a simpler, fairer, transparent, and yet accomplished grading and ranking system. Overall, the evaluation criteria will be established for each of the five student learning outcomes. A five point rubric rating scales may be developed by the faculty/school/department as shown in the following example:

5 points = Exceeds expectations

4 points = Meeting expectations

3 points = Fairly competent

2 point = Approaching

1 point = Not there yet

Similar type of rubric scaling may be framed from the given structure encompassing the local factors and

average student characteristics of the region or state.

6.4. Graduate Programme Learning Outcomes assessment Matrix

Student Learning Outcomes: The expected ability of students AFTER completion of the M.Sc. Biotechnology programme	Assessment: How we will assess how well students are learning this
Ability to recognize the need for learning the topic and develop foundational knowledge on the topic	Interview, Internal review and External Review
Ability to develop critical thinking and problem solving skills to solve interdisciplinary issues related to the topic	Examinations, oral presentation, group projects , proposals presentation and project report
Ability to demonstrate through knowledge understanding skills in application of scientific methodology to undertake report on experimental investigation	Oral presentation, group projects, assignments and project reports
Ability to apply statistical methods, ICT and innovative techniques in classroom, field and laboratory to analyze scientific data	Writing skills, Presentation, Interview and Internal review
Possess high awareness of major issues and development of cutting edge research and competent in initiating developing a scientific research	Oral presentation, group projects, assignments, proposal presentation and project report
Ability to design and execute a scientific project, write scientific reports, develop research and communicationskills	Experimentation skill, presentation, interview and external review
Ability to demonstrate knowledge and skills in analyzing and identifying entrepreneurship opportunities	Written assignments and research project reports
Ability to gain empirical knowledge on the topic and contribute in decision making processes	Writings skills, interview, internal review and external review
Ability to demonstrate leadership, to take action and to get others involve	Group assignments, reports and presentation

6.5 Detailed Syllabus

SEMESTER-I

MBT 101

Cell and Developmental Biology

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To get the historical basis and concept of cell and developmental Biology.

CLO2. To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles.

It also gives an idea how these cellular components are used to generate and utilize energy in cells.

CLO3. To find answer to the question “how continuity of life is maintained from one generation to another?”

CLO4. To explore the biomedical research involving tissue engineering that aims to grow and replace tissue *in-vitro* using stem cell technology.

CLO5. To understand the mechanism of plant development/improvement using breeding processes that contribute to the efforts of achieving sustainable food security in times of over population.

Course Content	No. of Classes
Unit – I: <ol style="list-style-type: none"> 1. Ultra structure of prokaryotic and eukaryotic cells; Cell organelles structure and functions; ATP synthase and generation of ATP; Chloroplast DNA and its significance. 2. Cell communication, Cell – ECM junction, adhesion molecules; Transport of ions; Mechanism and stages of secretory pathways; Cell cycle (Yeast), regulation of cell cycle. 3. Cell signaling – Cellular response to environmental signals in plants and animals; Mechanism of signal transduction. 	20
Unit –II: <ol style="list-style-type: none"> 1. Organization and role of microtubules and microfilaments; Cell shape and motility. 2. Action-binding proteins and their significance; Muscle organization and function; Molecular motors; Intermediate filaments; Extra cellular matrix in plants and animals. 	20
Unit –III: <ol style="list-style-type: none"> 1. Potency of embryonic cells, Commitment, Specification (Autonomous and Conditional), Determination and Differentiation, Morphogenetic gradients, Cell fate, cell lineages and development control genes in <i>Caenorhabditis</i> 2. Cellular movements and Pattern Formation – Differentiation of germ layers; Cellular polarity; Maternal gene effect; Homeotic gene effect in <i>Drosophila</i>; Embryogenesis and early pattern formation in plants, phase change in salmonella, mating cell types in yeast, Heterocyst 	20
Unit –IV <ol style="list-style-type: none"> 1. Metamorphosis of Amphibians and Insects; Hormonal control of metamorphosis, regeneration-different types of regeneration; Histological processes during regeneration; Polarity and metaplasia in regeneration; Lens regeneration in amphibian. 2. Organization of shoot and root apical meristem, pollen germination and pollen tube guidance, phloem differentiation, Self incompatibility and its genetic control, embryo and endosperm development, heterosis and apomixes. 3. Infertility, <i>In vitro</i> fertilization and embryo transfer, Stem cell differentiation, fibroblasts and its differentiation. Stem cell and its applications. Ethical Issues in Stem cells. 	25

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References:

1. Bruce Alberts *et al* .Molecular Biology of cell, Garland Publications
2. Daniel, Molecular Cell Biology, Sceintific American Books.
3. Jack D. Bruke, Cell Biology, The William Twilkins Company.
4. Old and Primrose, Principles of Gene Manipulations, Black Well Scientific Publications.
5. Wilson and Marrision, Cytology, Reinform Publications
6. E.J.Gardener, M.J.Simmons and D.P.Snustad, Principles of Genetics, John Wiley and Sons Publications.

MBT 102

Biochemistry

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand the actual chemical concepts of biology through the functioning of various body processes and physiology using bio-molecules.

CLO2. To understand the chemical basis of cellular life as well as the internal chemistry of biological systems of animals and plants.

CLO3. The study of biochemistry helps one to understand the actual chemical concepts of biology. That is the functioning of various body processes and physiology by uses of bio-molecules.

CLO4. To understand the concept of enzymes, its kinetics and importance in metabolism and other physiological reactions inside the cell.

CLO5. To understand the underlying concept of physiological processes occuring in plants and animals and their regulations. It also deals with the regulation and synthesis of plant and animals and animal hormones.

Course Content	No. of Classes
Unit 1: Basics of Biochemistry <ol style="list-style-type: none"> 1. Ionization of water, Concept of pH and pK. Buffer solutions, action of buffers.Henderson-Hasselback equation. Preparation of weak acids and bases. 2. Bioenergetics: Concept of energy, First and Second Law of thermodynamics. Free Energy Change, relation between standard free energy change and equilibrium constant, exergonic and endergonic reactions. 	20
Unit 2: Biomolecules <ol style="list-style-type: none"> 1. Structures and properties (chemical and physical) of carbohydrate, protein, amino acids, nucleic acids, and lipids. 2. Prediction of protein structure, Ramachandran plot; helix-coil transltion. 3. Enzyme nomenclature, enzyme kinetics, MM, LB, EH plots. Allosteric interactions and product inhibition. Enzyme immobilization. Co enzymes and prosthetic groups. 	25
Unit 3: Metabolism <ol style="list-style-type: none"> 1. Anabolism and catabolism of carbohydrate, amino acids, nucleotides, lipids. 2. Inborn metabolic errors of carbohydrates, proteinsand nucleic acids. 	25
Unit 4: Physiological processes in plants and animals	20

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Photosynthesis, light reaction and dark reaction, photosynthesis in C3 and C4 plants. 2. Animal and plant hormones (types, function, regulation and synthesis). 3. Applications of enzymes in food, pharmaceutical, textile and leather industries. | |
|--|--|

References:

1. Albert L. Lehninger Principles of Biochemistry- CBS Publishers & Distributors
2. Lubert Stryer Biochemistry –Freeman International Edition.
3. Dr.A.C.Deb Fundamental of Biochemistry –
4. U. Satyanarayana Biochemistry Books and Allied Pvt. Ltd.
5. Voet and Voet, Biochemistry- John Wiley and Sons.

MBT 103

Microbiology

Theory

Credit: 4

After successful completion, this course enables students

- CLO1.** To explore the fascinating world of microorganism and their role (both beneficial and harmful) in day to day life. It imparts knowledge on the various phases and contribution of different Scientists how Microbiology established itself as a separate branch of Science.
- CLO2.** To understand the different categories of microbes and sub-microbial groups with their position in the tree of life (classification), their characteristic features and importance.
- CLO3.** To become familiarize with the different technical aspects [isolation, cultivation, observation (microscopy), and identification] of studying microbes.
- CLO4.** To get an insight on the existence of microbes in different spheres of the environment and how the microbes are affected/induced in these environments or *vice versa*.
- CLO5.** To get the basic idea about the food substrate, microorganisms involved in food spoilage and food preservation methods. It also deals with the basic concept on food borne diseases in humans.

Course Content	No. of Classes
Unit I: Fundamentals of Microbiology <ol style="list-style-type: none"> 1. History of Microbiology, medical microbiology & immunology, agricultural & environmental microbiology, food & industrial microbiology and astrobiology. 2. Microscopy-principle and application of light, phase contrast and electron microscope. 3. Sterilization and disinfection- physical and chemical methods, disinfectants and mode of action, Culture. 4. Techniques- types and importance of culture media, pure culture methods, preservation of pure culture. 	20
Unit II: Microbial Diversity <ol style="list-style-type: none"> 1. Bacteriology: general properties of bacteria, morphology and ultra structure of bacteria. Gram-positive and Gram-negative bacteria. Recombination in bacteria. 2. Virology: discovery of viruses. Nature, properties and general morphology of virus. Transmission of plant virus. Lytic, lysogenic cycles, sub-viral particles (Viroids, Virusoids and Prions. Concept of antiviral compounds, interferons and viral vaccines. 	25

3. Phycology and mycology: General characteristics and classification of algae. Algae cell ultra-structure. Types of life cycle in algae. Importance and associations. General characteristics and classification of fungi. Fungal cell wall ultra- structure. Heterothallism and parasexuality in fungi	25
Unit III: Microorganisms and their natural habitats 1. Terrestrial Environment: Soil as a natural habitat of microbes. Soil microflora and their interactions in soil (symbiosis, mutualism, commensalism, competition, synergism and parasitism). Microbes in the Rhizosphere and their importance. Role of microbes in nutrient cycling (Nitrogen, Phosphorus and Sulfur). 2. Aquatic Environment: Microflora of Freshwater & Marine habitats. Microbial assessment of water quality and water purification. Eutrophication. Potability of water. A brief account of water born diseases in man. 3. Aerial Environment: Aeromicroflora. Source and dispersal of Microbes in air. Microbes in the Phyllosphere and their importance.	
Unit IV: Microbes in Food 1. Foods as a substrate for microorganisms: natural flora and source of contamination offoods. Microbial spoilage of various foods: principles and spoilage of vegetables, fruits, meat, eggs, milk and canned foods. 2. Principles and methods of food preservation: physical and chemical methods of food preservation. Food preservatives. 3. Basic concept of Fermented foods and food borne diseases in man.	20

References-

1. Atlas RM. (2005). *Principles of Microbiology*. 4th edition. WMT.Brown Publishers.
2. Madigan MT, Martinko JM and Parker J. (2009). *Brock Biology of Microorganisms*. 12th ed. Pearson/Benjamin Cummings.
3. Stanier RY, Ingraham JL, Wheelis ML, and Painter PR. (2009). *General Microbiology*. 7th ed. McMillan.
4. Pelczar MJ, Chan ECS and Krieg NR. (2010). *Microbiology*. 8th edition. McGraw Hill Book Company.
5. Tortora GJ, Funke BR, and Case CL. (2013). *Microbiology: An Introduction*. 11th edition. Pearson Education.
6. Willey JM, Sherwood LM, and Woolverton CJ. (2008). *Prescott, Harley and Klein's Microbiology*. 8th edition. McGraw Hill Higher Education.

MBT 104

Bioinstrumentation

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To develop concept on the important techniques necessary for the study and prediction of different processes occurring in microbes and other cellular organisms.

CLO2. To familiarize with the importance, principle and types of chromatography and centrifugation techniques and their role in the study of biological system.

CLO3. To familiarize with the importance, principle and types of electrophoretic techniques and their role in the study of biological system.

CLO4. To get an insight into the concept of radioactivity and its application in biochemical and immunological processes.

CLO5. To familiarize with *advanced techniques like* Protein Crystallization, MALDI-TOF, Mass Spectrometry, Enzyme and Cell Immobilization which are extensively used in Industrial and R & D sectors.

Course Content	No. of Classes
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Unit I: Basic Techniques 1. Buffers; Methods of cell disintegration; Enzyme assays and controls; Detergents and membraneproteins; Dialysis, Ultrafiltration and other membrane techniques Spectroscopy Techniques 2. Principles and Applications of UV, Visible Spectroscopy; Circular Dichroism; Fluorescence; Mass Spectroscopy, NMR Spectroscopy	25
Unit II: Chromatography Techniques 1. TLC and Paper chromatography; Gel permeation, Ion exchange, Hydrophobic, Reverse-phase and Affinity, chromatography; HPLC and FPLC Electrophoretic Techniques 1 Theory and application of Polyacrylamide and Agarose gel electrophoresis; Capillary electrophoresis; 2D Electrophoresis	20
Unit III: 1. Centrifugation Basic principles & theory (RCF, Sedimentation coefficient etc); Types of centrifuge - Microcentrifuge, High speed & Ultracentrifuges; Differential & density gradient centrifugation; 2. Applications (Isolation of cell components); Analytical centrifugation; Determination of molecular weight by sedimentation velocity.	15
Unit IV Radioactivity 1. Radioactive & stable isotopes; Pattern and rate of radioactive decay; Units of radioactivity; Measurement of radioactivity; Geiger-Muller counter; Solid & Liquid scintillation counters (Basic principle, instrumentation & technique); Autoradiography; 2. Applications of isotopes in biochemistry; Radiotracer techniques; Radioimmunoassay	15
Unit V Advanced Techniques 1. Protein crystallization; Theory and methods; API-electrospray and MALDI-TOF; Mass spectrometry; Enzyme and cell immobilization techniques; DNA & Peptide Synthesis.	10

References-

- 1 Abhilasha Shourie and Shilpa S Chapadgaonkar - "Bioanalytical Techniques"
- 2 Sabari and Ghoshal - "Fundamentals of Bioanalytical Techniques and Instrumentation"
- 3 Jeanette M van Emon - "Immunoassay and Other Bioanalytical Techniques"

MBT 105

Cell Biology, Biochemistry and Microbiology

Theory

Credit: 4

This course enhances the practical application of the concept on Microbiology, Biochemistry and Cell Biology. After successful completion, this course enables students

CLO1. To understand the different phases of cell-cycle during mitotic and meiotic cell division.

CLO2. To learn the principle and process for quantitative estimation (spectrophotometry) of DNA using (Diphenylamine method), RNA (Orcinol method) and protein analysis (vertical slab gel electrophoresis).

CLO3. To get an insight into the laboratory techniques for the isolation and enumeration of microorganisms from different environmental spheres like soil, water and air with special reference to
 -antibiotic producing microbes from soil
 -the effect of physical factors (temperature and pH) on growth

CLO4. To learn the principle and the process concerned with the study of bacteria including:

- isolating bacteria in pure cultures by streaking method
- determination of growth-phases in bacteria with the help of growth curve
- identification of unknown bacteria with the help of specific biochemical activity and staining techniques (Gram's, capsule and flagella staining)
- determination of sensitivity/resistance in bacteria against different antibiotic substances

CLO5. To get an insight into the biochemical methods for the estimation of carbohydrates, proteins and amino acids- both quantitatively and qualitatively.

It also helps students to develop the idea of separation of plant pigments and amino acids using chromatographic methods of TLC/ Paper chromatography.

Course Content	No. of Classes
Cell Biology (Any 4) <ol style="list-style-type: none"> 1. Study of mitosis and meiosis in dividing cells 2. Spectrophotometric quantification of DNA using Diphenylamine method. 3. Spectrophotometric quantification of RNA using Orcinol method. 4. Isolation and quantification of DNA from bacteria, plant and animal. 5. Agarose gel electrophoresis. 6. Protein analysis by vertical slab gel electrophoresis and characterization by standard protein marker. 	20
Biochemistry (Any 5) <ol style="list-style-type: none"> 1. Determination of reducing sugars by Nelson Somogyie method. 2. Determination of total carbohydrate by anthrone method. 3. Estimation of starch by anthrone method. 4. Determination of free acid of oil. 5. Determination of saponification value of oil. 6. Estimation of protein by Lowry's method. 7. Separation of pigments using paper chromatography. 8. Separation of amino acids using thin layer chromatography. 	30
Microbiology (Any 5) <ol style="list-style-type: none"> 1. Isolation and enumeration of microorganisms from soil (rhizosphere and rhizoplane), water and air (phyllosphere and phylloplane). 2. Isolation of antibiotic producing microbes from soil. 3. Study of effect of physical factors (temperature and pH) on growth of microbes. 4. Study of bacteria: 5. Study of bacterial growth curve. 6. Biochemical characterization of bacteria. 7. Staining techniques in bacteria (Gram's, capsule and flagella staining). 8. Antibiotic sensitivity test of bacteria. 9. Study of the vegetative and reproductive structures of <i>Aspergillus</i>, <i>Saccharomyces</i>, <i>Penicillium</i>, <i>Agaricus</i> and <i>Alternaria</i> through temporary and permanent slides. 	35

Reference:

1. S. Sadasivam and A. Manickam Biochemical Methods-, New Age International Publishers, New-Delhi.
2. Cappuccino J and Sherman N. (2010). *Microbiology: A Laboratory Manual*. 9th edition. Pearson Education limited.

SEMESTER II

MBT 201

Molecular Biology

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand the molecular basis of biological activity between biomolecules in the various systems of a cell.

CLO2. To familiarize with the basics of DNA, RNA, and proteins structure and their interactions within the cell to promote growth, division and development.

CLO3. To have the concept on the responses to environmental or physiological changes, or alterations of cell function brought about by mutation.

CLO4. To get an insight in to the wide range of mechanisms required for gene regulation in different organisms.

CLO5. To understand the molecular basis of cancer and other diseases and the pattern of interaction of animal cells with micro-organisms and viruses.

It also deals with the application of recombinant DNA techniques to problems in basic science and biotechnology.

Course Content	No. of Classes
Unit-1: Organization of genetic materials <ol style="list-style-type: none">Various models to explain the structure of the nucleus and chromosomes, Special type of chromosomes: lamp brush, salivary and B chromosomes.Packaging of DNA as nucleosomes in eukaryotes, Chromosomal DNA contents and Cvalue paradox. Structural changes in the chromosomesMultigene families in eukaryotes; Genomic organization in prokaryotes and Archaeobacteria	20
Unit-II: DNA replication and repair <ol style="list-style-type: none">Enzymes & accessory proteins involved in DNA replicationReplication process in prokaryotic & Eukaryotic DNA. Regulations of Eukaryotic replicationDNA Repair:- Types of DNA Repair, Mechanism of DNA Repair	15
Unit-III: Transcription <ol style="list-style-type: none">Importance of DNA binding Proteins, RNA polymeraseMechanism of Transcription in prokaryotes & EukaryotesProcessing of RNA:- m-RNA processing, 5' capping, 3' polyadenylation, splicing r-RNA & t-RNA processing	15
Unit-IV: Translation <ol style="list-style-type: none">The translation machinery, role of t RNA & ribosome; Mechanism, of translationPost translational modification of proteins such as phosphorylation, adenylation, acylation and glycosylation	15
Unit-V: Regulation & gene expression in Prokaryotes & eukaryotes <ol style="list-style-type: none">Operon concept (Lac operon, trp operon, his operon and arabinose operon), Structural basis of DNA-Protein interaction; Attenuation & terminationGene silencing:- DNA methylation,Chromatin modification & gene expression. Histone acetylation & deacetylation; Environmental regulation of gene expression.	15

References:

- 1 Glick, B.T and Pasternak J.J (1998) Molecular Biotechnology, Principles and application of recombinant DNA, Washington D.C. ASM press.
- 2 Howe.C. (1995) Gene Cloning and Manipulations, Cambridge University Press, USA
- 3 Lewin, B., Gene VI New York, Oxford University Press.
- 4 Rigby, P.W.J. (1987) Genetic Engineering, Academic Press Inc. Florida, USA.\
- 5 Karp.G (2002) Cell and Molecular Biology, 3rd Edition, John Wiley and Sons; INC
- 6 Cell and Molecular Biology- P.K. Gupta, Rastogi Publishers, Meerut.

MBT 202

Immunology

Theory

Credit: 4

After completion, this course enables students

CLO1. To familiarize with the concept of non-specific (innate) and specific (acquired) resistance mechanism developed in man against pathogens and other non-self factors which is the basis of this course.

CLO2. To get an insight into the formation, types, organization and functional specificity of different cellular and organ level components conferring resistance in man.

CLO3. To understand the nature, types and function of antigens that induce immunological response in man and how the product of this response (antibody, B and T cells) help in neutralizing them (agglutination and precipitation reactions).

CLO4. To have the concept of different mediators/cell signaling molecules (complement, cytokines: interferons, Interleukins, hematopoietins and chemokines) associated with immunological responses as well as their biological consequences.

CLO5. To deal with the different diagnostic and serological approaches for the study of interaction between an antigen and its specific antibody including Widal Test, immunodiffusion, Immuno-electrophoresis, ELISA and RIA.

It also gives an idea on immune-disorders (hypersensitivity, autoimmune disorders, oncogenesis etc.) and induced immunity (vaccination) to overcome such abnormalities.

Course Content	No. of Classes
Unit – I	10
1. Introduction: Physiology of immune system, Innate and acquired immunity. Clonal nature of immune response, Artificial immunity.	
Unit – II	15
1. Cells of immune system: Lymphoid lineage (producing B and T lymphocytes) and myeloid lineage (Phagocytes: macrophages, neutrophils and eosinophils and auxiliary cells; basophils, mast cells and platelets.	
2. Organs of immune system: primary and secondary lymphoid organs.	
Unit – III	20
1. Antigens: Nature, function and types (Haptens, super antigens and cluster of differentiation molecules (CDs), Processing and presentation of antigens.	
2. Immunoglobulins – structure and types, Antigen antibody reactions. Major histocompatibility complex, MHC gene organization; Class I and Class II MHC molecules, their structure & functions.	
3. B - cell and T- cell receptors, Organization of Immunoglobulin gene, Class switching.	
Unit – IV	15
1. Complement: Pathways of complement activation; biological consequence of complement activation, Cytokines: interferons (α , β and γ), TNF, Interleukins, hematopoietins and chemokines.	
Unit- V	

1. Monoclonal antibodies–hybridoma technology; antigen–antibody reactions; agglutination reaction (Widal, haemagglutination); Precipitation reactions (immunodiffusion, Immuno-electrophoresis), Immunoblotting, ELISA, RIA; immunoelectron-microscopy.	10
Unit- VI 1. Immunization by vaccines: Vaccine types & functions, Immune disorder; hypersensitivity; autoimmune diseases. 2. Organs transplantation reaction; immunodeficiency, Tumour Immunology (Basic idea).	15

References:

1. Kuby J, Thomas J. Kindt, Barbara, A. Osborne Immunology, 6th Edition, Freeman, 2002.
2. Janeway et al., Immunobiology, 4th Edition, Current Biology publications., 1999. Brostoff J, Seadhin JK, Male D, Roitt IM., Clinical Immunology, 6th Edition, Gower Medical Publishing, 2002.
3. Paul, Fundamental of Immunology, 4th edition, Lippencott Raven, 1999.
4. Goding, Monoclonal antibodies, Academic Press. 1985.

MBT 203

Genetics

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand basic principles of Mendelian inheritance.

CLO2. To study cell division and chromosome segregation during the process.

CLO3. To explore the multifactorial inheritance and understand the chromosome structure, chromatin organization and variation.

CLO4. To learn the concepts of Linkage, concept of sex determination and sex linked inheritance which help to understand about different sex influenced human diseases.

CLO5. To gain knowledge about the organellar inheritance, genome evolution, mutation and basis of several hereditary diseases.

Course Content	No. of Classes
UNIT-I: Bacterial mutants and mutations 1. Isolation; Useful phenotypes (auxotrophic, conditional, lethal, resistant) 2. Mutation rate; Types of mutations (base pair changes; frameshift; insertions; deletions; tandem duplication) 3. Reversion vs. suppression 4. Mutagenic agents; Mechanisms of mutagenesis; Assay of mutagenic agents (Ames test)	20
UNIT-II: Mendelian genetics 1. Introduction to human genetics; Background and history 2. Types of genetic diseases; Role of genetics in medicine; 3. Human pedigrees 4. Patterns of single gene inheritance-autosomal recessive; Autosomal dominant; X linked inheritance 5. Hemoglobinopathies -Genetic disorders of hemoglobin and their diseases.	20
UNIT-III: Non Mendelian inheritance patterns 1. Mitochondrial inheritance 2. Genomic imprinting; Lyon hypothesis 3. Isodisomy; Complex inheritance 4. Genetic and environmental variation; Heritability; Twin studies 5. Behavioral traits; Analysis of quantitative and qualitative traits	20

UNIT-IV: Introduction to genomics <ol style="list-style-type: none"> 1. Introduction to genomics-Structural organization of genomes in prokaryotes and eukaryotes. 2. Organelle DNA- Mitochondria and Chloroplast 3. Tools for genome analysis 4. Genome sequencing projects- Human genome project 	25
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References:

- 1 N. Trun and J. Trempy, Fundamental Bacterial Genetics, Blackwell publishing, 2004.
- 2 Strachan T and Read A P, Human molecular genetics, 3rd Edition Wiley Bios, 2006.
- 3 Gardner EJ, Simmons MJ, Snustad DP (2008). Principles of Genetics. 8th Ed. Wiley-India
- 4 E.J Gardner, Principles of genetics (2015), *th Edition, Wiley India
- 5 T.A. Brown, Genetics A Molecular Approach, (2012), 3rd Edition

MBT 204

Biostatistics, Bioethics and IPR

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand the ethical and safety issues concerned with Biotechnological experiments.

CLO2. To understand the basics of intellectual property rights including the concept, types, importance and legal issues related to patents, trademarks, copyright, industrial design and rights, traditional knowledge and geographical indicators.

CLO3. To get the idea about the process of granting patent by patenting authorities with reference to types of patent applications, patent filing procedures, patent licensing and agreement and rights and duties of patent owner.

CLO4. To have knowledge on the agreements, treaties and international recognition in connection to protect innovations and novel works; It also gives an idea on Indian Patent Act (1970) and recent amendments.

CLO5. To understand the guidelines in using radioisotopes in laboratories, safety measures and disposal mechanism.

Course Content	No. of Classes
Unit – I Biostatistics <ol style="list-style-type: none"> 1. Application of statistics in biological science; measurement of central tendency and dispersion. Mean variance, standard deviation, standard error, co-efficient of variance. 2. Concept of probability and probability laws; standard probability distribution – binomial, poisson and normal distributions. 3. Test of hypothesis. Test of significance based on z, χ^2, t and F statistics; correlation and regression. Analysis of variance and co-variance; one-way and two-way ANOVA. 4. Random sampling; principles of design of experiments; CRD, RBD, LSD; transformation of data; comparison of mean. 	20
Unit –II Bioethics <p>Foundation of Bioethics</p> <ol style="list-style-type: none"> 1. Definition, historic evolution, codes and guidelines, universal principles. 2. Bioethics: Necessity of Bioethics. Different paradigms of Bioethics-National & International. 3. Ethical issues against the molecular technologies. 	20
<p>Clinical ethics</p> <ol style="list-style-type: none"> 1. Sanctity of human life and the need to preserve human life; issues related to prenatal screening, clinical trials (Phase I/II/III/IV) studies. 	20

2. Medical error and medical negligence; remedies against medical negligence, protection and compensation related to it. 3. Ethical use of animals in the laboratory Unit –III IPR 1. Introduction to IPR: History, Importance and scope. 2. Forms of IPR- Patent, trademark, copyright, traditional knowledge, geographical indicators, tradeseecrets. 3. TRIPS, WIPO, WTO. 4. Farmers rights, Plant variety- suigenensis. 5. Indian Patent Act (Brief idea). 6. Case studies: Turmeric, Superbug, Basmati rice.	20
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References and Links:

1. Biostatistics: A foundation for analysis in the health science – W.W.Daniel; John Wiley.
2. Instrumental Methods of analysis – Willare, Mermitt& Dean.
3. <http://www.w3.org/IPR/>
4. <http://www.wipo.int/portal/index.html.en>
5. http://www.ipr.co.uk/IP_conventions/patent_cooperation_treaty.html
6. www.patentoffice.nic.in

MBT 205 Practical on Immunology and Molecular Biology Theory Credit: 4

This practical course enhances the applicability of the concept on Molecular Biology and Immunology. After successful completion, this course enables students

CLO1. To understand the principle and process of

- blood group determination following slide agglutination test,
- blood cell count and identification following blood film preparation and
- immuno-diagnostic methods like Radial immunoassay and ELISA

CLO2. To acquaint with the principle and process of the immunodiffusion techniques like ODD, SRID, Immuno-electrophoresis and counter-current electrophoresis.

CLO3. To learn the principle and process for the isolation DNA from bacterial, plant and animal sources and their quantification using agarose gel electrophoresis

CLO4. To learn the principle and process of restriction digestion analysis by agarose and polyacrylamide gel electrophoresis (over-expression of proteins by SDS-PAGE.

CLO5. To learn the principle and process for the isolation and cloning of plasmid DNA and their amplification by PCR (RAPD analysis).

Course Content	No. of Classes
Immunology: 1. Blood film preparation and identification of cells. 2. Preparation of antigen. 3. Immunization, serum collection and preservation. 4. Purification of IgG from serum. 5. SGOT – PT test; agglutination. 6. Immunoelectrophoresis, Immuno-peroxidase test; Immunofluorescence test, ELISA. 7. Isolation of lymphoid cells (mouse) from spleen. 8. Separation of mononuclear cells.	40

Molecular Biology**40**

1. Spectrophotometric quantification of DNA using Diphenylamine method.
2. Spectrophotometric quantification of RNA using Orcinol method.
3. Isolation and quantification of DNA from bacteria, plant and animal.
4. Agarose gel electrophoresis.
5. Protein analysis by vertical slab gel electrophoresis and characterization by standard protein marker.

References:

1. F.C. Hay, O.M.R. Westwood, Practical Immunology, 4th Edition-, Blackwell Publishing, 2002.
2. Sambrook et al (2000) Molecular Cloning Volumes I, II, & III Cold Spring Harbor Lab. Press, New York, USA
3. Ed Harlow, David Lane, Antibodies Laboratory Manual, Cold Spring Harbor, Laboratory Press, 1988.

SEMESTER III

After completion, this course enables students

CLO1. To have the basic concept of genetic engineering and r-DNA technology laying the basis of genetic modification of cellular organisms.

CLO2. To develop the concept about the types, nature and functions of restriction enzymes that act as the mediators of DNA modification during genetic manipulation process.

CLO3. To get an insight into the concept of different vectors (plasmids, cosmids, phagemids, artificial chromosome vectors) that act as carrier of DNA fragment between cellular organisms during genetic modification.

CLO4. To understand the different blotting techniques (Southern, Northern and Western) hybridization process as well as the construction and screening genomic and c DNA libraries.

CLO5. To have concept about the most versatile molecular technique of Polymerized Chain Reaction (PCR); its types, applications and different PCR based and PCR independent marker (RAPD, RFLP, AFLP) methods in Molecular Biology.

	No. of Classes
Course Content	No. of Classes
Unit- I	20
1. Genetic engineering and its applications: Restriction enzymes, DNA Ligases, Klenow fragment, polymerases and other modifying enzymes.	
2. Cohesive and blunt end ligation, linkers, adaptors and homopolymeric tailing, Restriction digestion and mapping of clone genes	
Unit- II	20
1. Important vectors- plasmid, bacteriophages, M13, insertion and replacement vectors, cosmids, YAC, BAC, Expression vectors and shuttle vectors, Plants based vectors – Ti and Ri vectors	
2. Regulation of copy number in plasmid, iterons, Construction and screening of genomic and cDNA libraries	25
Unit- III	25
1. PCR, types and its application	
2. DNA sequencing- Maxam and Gilbert's method, Sanger's method, Pyrosequencing, automated DNA sequencing.	
3. DNA fingerprinting, RFLP, RAPD, AFLP, ISSR, SNP.	
Unit- IV	25
1. Hybridization techniques- Northern, Southern and Western Hybridization, Nick translation, random priming and probes, Marker genes and reporter genes	
2. Introduction of DNA into mammalian cells, transfection techniques	
3. Methods for creation of transgenic plants and animals, Uses of transgenics.	20

References:

1. J Sambrook, E F Fritsch and T Maniatis, Molecular Cloning: a Laboratory Manual, Cold Spring Harbor Laboratory Press, New York, 2000.
2. T.A Brown, Gene Cloning and DNA Analysis, An Introduction, 8th Edition, Wiley Blackwell
3. SM Kingsman and A J Kingsman Genetic Engineering, An Introduction to gene analysis & exploitation in eukaryotes, Blackwell Scientific Publications, Oxford, 1998.
4. S B Primrose, Molecular Biotechnology (2nd Edn.), Blackwell Scientific Publishers, Oxford, 1994.
5. S.B. Primrose and R.M Twyman, Principles of Gene Manipulation and Genomics, 7th Edition, Wiley Blackwell

MBT 302

Plant and Animal Biotechnology

Theory

Credit:4

After successful completion, this course enables students

CLO1. To familiarize with the techniques of plant and animal cell culture, mechanisms of gene transfer and various molecular marker assisted methods in improvement of live-stocks and crop plants.

CLO2. To have knowledge on different tissue and cell culture media and their preparation methods.

CLO3. To explore the biomedical research involving tissue engineering that aims to grow and replace tissue *in-vitro* using stem cell technology.

CLO4. To understand the various vectorless and vector mediated gene transfer methods used in plant and animal cell cloning.

CLO5. To have the basic understanding of plant and animal tissue culture and its maintenance as well as to get the insight in to the concept of callus and suspension culture, somaclonal variation, callus cultur, totipotency, hybrid and cybrids.

Course Content	No. of Classes
Unit- I 1. Tissue Culture Methodology, Culture media, Initiation and maintenance of cultures. 2. Micropropagation- Multiple shoot proliferation, rooting of the micro-shoots and transfer to soil, hardening, acclimatization and final transfer of whole plant to field. Applications- Clonal propagation, Production of disease free plants.	10
Unit- II 1. Culture media and culture conditions, preparation of cell suspension, maintenance of suspension culture Callus culture media, culture and callus induction, organogenesis and somatic embryogenesis 2. Shoot development, rooting and transfer of plantlets to soil, Somaclonal variation. Artificial seed production- synthetic seeds. Induction of secondary metabolite production, acceleration and inhibition of the products and elicitors.	10
Unit- III 1. Haploid production- importance of haploids, progress in the development of haploid technology, Culture media and culture conditions, source materials for haploid culture. Anther and ovary culture, organogenesis, haploid plant regeneration, Embryo culture and embryo rescue 2. Protoplast technology- Prospects of protoplast technology. Media and solutions, Protoplast isolation techniques, purification of protoplasts, viability of protoplast, Culture of protoplasts and regeneration of plants, Somatic hybridization- protoplast fusion, cybrids and their utilization	15
Unit- IV 1. Animal Biotechnology: historical background, scope and possible applications. 2. Requirements in an animal cell culture laboratory.	10

Unit- V 1. Transgenic technology- gene transfer in nuclear genome and chloroplasts, direct and <i>Agrobacterium</i> mediated gene transfer, gene silencing. 2. Transgenic production for insect resistance, disease resistance, male sterility and longer shelf life, male sterility. Scenario of transgenic technology, success of gene transfer in economically important crop plants.	10
Unit- VI 1. Transgenic technology- gene transfer in nuclear genome and chloroplasts, direct and <i>Agrobacterium</i> mediated gene transfer, gene silencing. 2. Transgenic production for insect resistance, disease resistance, male sterility and longer shelf life, male sterility. 3. Present scenario of transgenic technology, success of gene transfer in economically important crop plants. 4. Merits and demerits of transgenic technology. Genetically modified plants and international biosafety controls.	15
Unit- VII 1. Animal cell and tissue culture: Scope Laboratory requirements, Culture media, Culture procedures, Primary cultures and cell lines. 2. Stem cell technology: Definition, functions, origin and types of stem cells; Therapeutic cloning for embryonic stem cells; Ethical issue. 3. In vitro fertilization and embryo transfer in human and livestock; Techniques and utility. Transgenic animals- important vectors, transformation methods. 4. Application of transgenic animals- mice, sheep, pigs and cows.	15

References:

1. M. K. Razdan An Introduction to Plant Tissue Culture: Tata Mc Graw Hill Publishing Co. Ltd. 2004.
2. J. Hammond, P. MaGarvey and V.Yusibov (Eds)., Plant Biotechnology: Springer Verlag. 2000.
3. H. S. Chawla, Introduction to Plant Biotechnology: (Second edition), Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 2004.
4. P. K. Gupta, Rastogi and Co Elements of Biotechnology: Meerut, 2007
5. R. Ian Freshney, Culture of Animal Cells: A Manual of Basic Technique and Specialised Applications, (2010), 6th Edition, John Wiley and Sons.
6. M.M. Ranga, Animal Biotechnology, 3rd Revised Edition.

MBT 303

Omics and Bioinformatics

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand the contents and properties of bioinformatics databases; perform text- and sequence-based searches, and analyze and discuss the results in light of molecular biological knowledge.

CLO2. To learn about the major steps in pair wise and multiple sequence alignment, and execute pair wise sequence alignment by dynamic programming.

CLO3. To learn the techniques of predicting the secondary and tertiary structures of protein sequences.

CLO4. To become familiar with the use of a wide variety of internet applications, biological database that can be applied in solving research problems.

CLO5. To understand the theoretical and practical development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser.

Course Content	No. of Classes
UNIT I: INTRODUCTION 1. History of Omics world, Branches of Omics, Scope, Applications and Limitations, Omics resources.	10
UNIT II: GENOMICS 1. Genome and genomics, Comparative, Functional and Structural Genomics, Genome sequencing projects, Genome sequencing technologies, Big Data. 2. Genome annotation, Genome databases, Genome browsers and Data retrieval, Applications of genomics in agriculture, human health and industry.	15
UNIT III: TRANSCRIPTOMICS 1. Concept on transcriptomics, Analysing gene expression – Northern blot, Real Time-PCR, subtractive hybridization, differential display, SAGE, Microarrays, NGS technologies. 2. Analysis & Annotation of transcriptome-ORF, Exon–Intron boundaries, Transcript assembly, BLAST, Gene ontologies (GO), Transcript databases-EST, SRA.	15
UNIT IV: PROTEOMICS 1. Proteome and proteomics, General scheme to proteomics analysis, Qualitative and quantitative proteome analysis, Shotgun proteomics for proteome profile. 2. Identification of differentially expressed proteins, Protein motif and conserved domain, Protein Information resources-PDB, Swissprot, pfam, Data retrieval and comparative proteomics.	15
UNIT V: METABOLOMICS 1. Introduction to Metabolites, Analytical technologies in metabolomics: separation methods and detection methods, Nuclear Magnetic Resonance Spectroscopy and Mass Spectrometry in metabolomics. Metabolic pathway resources: KEGG, Metabolomics and ionomics for elucidating metabolic pathways.	15
UNIT VI: BIOINFORMATICS APPLICATIONS 1. Concept in sequence alignment, Pairwise and Multiple sequence alignment, Phylogenetics analysis, BioEdit, ClustalW, MEGA, Restriction mapping, Genome mapping. 2. Secondary structure prediction of nucleic acids and proteins, Homology modeling, Ramachandran plot, Visualisation of proteins 3D structure-RASMOL, Protein-protein interaction and pathways analysis.	20

References:

1. Current Protocols in Bioinformatics, Edited by A.D. Baxevanis et al, Wiley Publishers, 2005.
2. Bioinformatics by David W. Mount, Cold Spring Harbor Laboratory Press, 2001.
3. Fundamental concepts of Bioinformatics by D.E. Krane and M.L Raymer, Pearson Education, 2003.
4. Discovering Genomics, Proteomics & Bioinfo, A.M. Campbell, C.S.H. Press, 2003.
5. Comparative Genomics by Melody S. Clark. Kluwer Academic Publishers, 2001.

MBT 304

Food and Industrial Biotechnology

Theory

Credit- 4

After successful completion, this course enables students

CLO1. To understand the role of biotechnology in food production, food processing, and food security.

CLO2. To learn about the conditions under which the organisms responsible for the deterioration of food can be inactivated, killed or made harmless.

CLO3. To understand the principles involving food preservation via fermentation processes.

It also acquaints with various kinds of Bioreactor and fermenters used in Industries for food production.

CLO4. To have knowledge for improving the industrially useful microorganisms genetically and to understand the process and role of enzyme immobilization in food industries.

CLO5. To get an insight in to the principles and current practices of processing techniques and the effects of processing parameters on product quality.

It also deals with the pre- and probiotic microorganisms and their importance.

Course Content	No. of Classes
Unit-I Fundamentals of food 1. Basics of food, Types and Classification of food. 2. Microbes involved in food spoilage, Food preservation – Physical and Chemical and biological methods. Merits and drawbacks of different methods of food preservation, Food packaging.	20
Unit-II Fermented food 1. Food and beverage fermentation: of cabbage, soybean (miso, soya, natto, sofu), milk (kumiss, yoghurt, kefir), fish and meat. 2. Pre- and pro-biotic microorganism: GRAS microorganism, Starter culture, Industrial production of alcohols and organic acids (acetic acid, citric acid and lactic acid) and SCP.	20
Unit- III Commercialization of fermented food and food laws 1. Commercialization of fermented food. 2. Benefits of fermented food products; Nutritional values and safety aspects. 3. Enzymes in food processing industries. Immobilized enzymes and their applications. 4. Genetic improvement of industrially important micro organism.	25
Unit- IV Bioreactor 1. Bioreactor: types, structure and design. Automation in bioreactor. Bioreactor for animal cell culture.	15

References:

1. Prescott and Dunn (1987) Industrial Microbiology 4th Edition, CBS Publishers & Distributors.
2. Crueger W. and Crueger A. (2000) A Text of Industrial Microbiology, 2nd Edition, PanimaPublishing Corp.
3. Stanbury P.F, Ehitaker H, Hall S.J (1997). Principles of Fermentation Technology, Aditya Books (P) Ltd.
4. Fraizer and Werthoff Food Microbiology –
5. Joshi and Pandey. Food Fermentation – Microbiology, Biochemistry & Technology, Vol. I & II.

MBT 305 Practical on Genetic Engineering, Plant & Animal Biotechnology, Bioinformatics and Food & Industrial Biotechnology

Credit: 4

This practical course gives the idea of industrial production of important material using fermenter, improvement of crop using the concept of Genetic Engineering and methods like micropropagation. After successful completion, this course enables students

CLO1. To acquaint with methods for the isolation of chromosomal DNA from plant and microbial cells, their qualitative and quantitative analysis as well as to become familiar with the technical process of PCR.

It also helps in learning the technique of restriction digestion of DNA and its separation by Gel Electrophoresis and Protein profiling using SDS PAGE.

CLO2. To learn the preparation of medium used in plant tissue culture and carry out the process like micropropagation and artificial seed preparation.

CLO3. To understand the design and working principle of a fermenter and its use in the industrial production of solvent, enzymes etc.).

CLO4. To learn the different laboratory methods to determine quality of food products (MBRT and Alkaline phosphatase test to check the efficiency of pasteurization of milk).

CLO5. To understand the practical aspects of Bioinformatics including

- a. Operating systems like UNIX, LINUX and Windows;
- b. Bioinformatics databases systems like NCBI/ PDB/ DDBJ, Uniprot, PDB;
- c. Sequence retrieval using BLAST and sequence alignment & phylogenetic analysis using clustalW & phylip;
- d. Protein structure prediction using psipred, homology modeling using Swissmodel, and molecular visualization using jmol.

Course Content	No. of Classes
Genetic Engineering (Any 4) <ol style="list-style-type: none"> 1. Isolation and quantification of plant genomic and plasmid DNA. 2. Agarose gel electrophoresis of DNA. 3. PCR Amplification of DNA. 4. Construction of restriction map- Plasmid DNA. 5. Cloning of DNA fragments in plasmid vector. 6. Colony hybridization for screening of libraries using probe. 	20
Plant Biotechnology (Any 4) <ol style="list-style-type: none"> 1. Preparation of media for plant tissue culture. 2. Micropropagation using apical/nodal explants. 3. Callus culture using apical meristem, embryo/cotyledon. 4. Preparation of artificial seeds. 5. Anther and embryo culture. 6. Establishment of suspension culture. 	20
Animal biotechnology (Any 2) <ol style="list-style-type: none"> 1. Study of equipments and materials for animal cell culture. 2. Demonstration of the process and techniques of animal cell culture. 3. Induced ovulation in mouse/ rats. 4. Visit to reputed animal biotechnology laboratory, study on areas of research being continued therein and preparation of a report on IVF and / or success and failure rate. 	10
Bioinformatics (Any 4) <ol style="list-style-type: none"> 1. Accessing Biological databases: Retrieving protein and nucleic acid sequences, structures, EST sequences, SNP data using database browsers and genome browsers. Converting sequences between different formats using sequence editors. Sequence assembly. 2. Nucleic acid sequence analysis: Detecting ORF's, identification of translational and transcriptional signals, gene predictions, codon usage, RNA folds analysis. 3. Sequence alignment and applications: pair wise alignment-dot matrix comparisons, global and local alignment, Database searching-different pair wise methods. Use of scoring matrices and gap penalties. 	15

<p>4. Multiple sequence alignment and applications: Use of multiple sequence editors. Progressive alignment and iterative alignment approaches. Use of profile methods formation detection. Clustering and Phylogeny approaches.</p> <p>7. Protein Sequence analysis: Composition, Hydrophobicity and prediction of trans-membrane proteins.</p> <p>Food & Industrial Biotechnology: (Any 4)</p> <ol style="list-style-type: none"> 1. Grape juice fermentation by <i>Saccharomyces cerevisiae</i>. 2. Sauerkraut fermentation and study of microbial profile during fermentation. 3. Study of microbial of starter culture ('bakhar'). ? 4. Screening of food – borne molds for amylase production. 5. Immobilization of <i>S. cerevisiae</i> for study of bioconversion of glucose. ? 6. Microbial biomass production using pleurotussajor-caju / <i>P. cringii</i> etc. 7. Extraction of casein from milk. 8. Determination of milk quality by methylene blue reductase test. 	20
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SEMESTER IV

MBT 401

Environmental Biotechnology

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand the environment around us and the organisms living in normal and extreme conditions of the environment.

CLO2. To learn the utilization of the unique properties microorganisms living in the extreme habitats to remediate degraded environment: such as solid and liquid waste management.

CLO3. To get the information on the ethical and safety issues concerned with Biotechnological experiments.

CLO4. To get an insight into how microbes affecting aquatic health and what are the different approaches for monitoring and maintaining potability of water.

CLO5. To familiarize with the important environmental roles played by microbes specifically in the light of sewage treatment, litter decomposition, maintenance of soil health and at the same time in metal recovery process (bioleaching).

Course Content	No. of Classes
Unit- I: Fundamentals of Environmental Biotechnology 1. Environmental Biotechnology: definition, achievements, opportunities and challenges. Microbial process involvement in bio-composting, bio-fertilizers, bio-pesticides, and bio-weedicides. Bio-plastic and biosensors for environmental monitoring. 2. Microbes in normal (soil, water and soil) and extreme (thermophiles, acidophiles, alkaliphiles, psychrophiles, halophiles and xerophiles) environment. 3. Methanogens and their applications. Biochemical process of methanogenesis.	25
Unit- II: Microbes in Environmental Management 1. Involvement of microbes in domestic and industrial waste-water treatment: a. Solid Waste Management: Sources and types of solid waste, methods of disposal of solid waste (incineration, composting and sanitary landfill) b. Liquid Waste Management: Composition of sewage; strength of sewage (BOD and COD); Primary, secondary (aerobic-oxidation pond, trickling filter, rotating biological contractor/ biodisc system, activated sludge process and anaerobic-septic tank, imhoff tank, anaerobic digester) and tertiary sewage treatment. 2. Bioleaching: Concept and application of microbes in bioleaching of copper and gold, Microbial enhanced oil recovery (MEOR) technique.	25
Unit III: Bioremediation of Hazardous Waste 1. Bioremediation: Concept (<i>in situ</i> and <i>ex situ</i> bioremediation) and role of bioremediation in controlling various pollution problems (industrial and medical effluents,). Basic concept of phyto-remediation and myco-remediation. 2. Bioremediation of heavy metals, oil spills, plastics, cellulose and paper, xenobiotics.	20
Unit IV: Basic Techniques in Environmental Biotechnology 1. Environmental genomics/ metagenomics: a general account. 2. Environmental bio-safety: a general account. 3. Culture dependant and culture independent techniques in Environmental Biotechnology: ARDRA, DGGE, FAME profile analysis, G+C analysis.	15

References:

1. Evans, G.M. and Furlong, J.C. (2003). *Environmental Biotechnology: Theory and Application*. John Wiley and Sons.
2. Jogdand, S.N. (2006). *Environmental Biotechnology*. Himalaya Publishing House.

3. Lohar, P.S. (2005). *Biotechnology*. MJP Publishers, Chennai.
4. Singh, B. D. (1998). *Biotechnology*. Kalyani publishers.
5. Joshi, R.M. Biosafety and Bioethics, Eastern Book House.
6. Das, M.K. (2008). *Environmental Biotechnology and Biodiversity Conservation*. Daya Publishing House, New Delhi.

MBT 402

Research Methodology

Theory

Credit: 4

After successful completion, this course enables students

CLO1. To understand the concept, types and criteria of research, addressing the identification of a research problem, objectives, designs and methodology to carry out a research work.

CLO2. To get the basic knowledge on qualitative research techniques and on the collection and analysis quantitative data.

CLO3. To get an insight in to formulating a hypothesis, data analysis for hypothesis-testing as well as formulation of research synopsis and report.

CLO4. To have adequate knowledge on measurement and scaling techniques for analyzing research outcomes thereby enabling them in justifying their findings.

CLO5. To develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/ Research problem.

Course Content	No. of Classes
Unit I: Fundamentals of Research Methodology 1. Definition and Objectives of Research. Types (Descriptive, Analytical, Applied, Fundamental, Qualitative, Quantitative, Conceptual and Empirical) and Significance of Research. 2. Research Approaches. Research Methods versus Methodology; Criteria of a Good Research.	15
Unit II: Research Problem 1. Definition of Research Problem. Necessity of defining Research Problem. Techniques involved in Defining a Research Problem.	5
Unit III: Research Design 1. Meaning and Need of Research Design, Important concepts related to Research Design. Features of a Good Design.	10
Unit IV: Data Collection 1. Collection of Primary Data: Observation and Interview Methods, Collection of Data through questionnaires, Collection of Secondary Data. 2. Selection of Appropriate Methods for Data Collection.	15
Unit V: Data Analysis 1. Processing and Analysis of Data; processing operations, problems in processing, simple regression, multiple correlation and regression analysis, T-test, Analysis of variation and co-variations; what is ANOVA, basic principle of ANOVA	15
Unit VI: Hypothesis Testing 1. Concept of hypothesis and hypothesis testing, Important parametric tests; hypothesis testing of means.	15
Unit VII: Data Interpretation and Report Writing	10

4. 1. Meaning and Importance of Interpretation. Techniques of Interpretation, Significance of Report Writing.	
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References:

1. Kothari, C. R. (2004), Research Methodology: Methods and Techniques, New Age International Publishers.

MBT 403

Practical on Environmental Biotechnology

Theory

Credit: 04

This practical course gives the idea of analytical methods used in biological laboratories, application such methods in solving issues related to the environment. After successful completion, this course enables students

CLO1. To understand the quality/potability of water through bacteriological analysis of water samples.

CLO2. To learn the laboratory methods for the estimation of Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) through which the condition of a water body can be determined.

CLO3. To learn the estimation of nitrate/phosphate/silicate content of waste water which can make an aquatic system eutrophic.

CLO4. To study of different physico-chemical parameters (pH, water holding capacity, soil moisture content, soil organic carbon, soil organic matter) of soil thereby to assess the nature of a particular soil.

CLO5. To study different enzymatic processes carried out by microbes in soil including amylase and cellulase activity during decomposition of litter.

Course Content

**No. of
Classes
75**

1. Qualitative analysis of water by MPN counts (for fecal coliforms) method.
2. Bacteriological analysis of water (presumptive, confirmed and completed test)
3. Study of amylase and cellulase activity of microbes.
4. Determination of Dissolved Oxygen (DO), Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) of water body.
5. Study of physico-chemical parameters (pH, water holding capacity, soil moisture content, soil organic carbon, soil organic matter) of soil.
6. Estimation of nitrate/phosphate/silicate content of waste water.

Dissertation Work and lab Visit Report

MBT 404:

Credit: 4

Course Title: Human Values and Professional Ethics
Course Code: HVP-740
[Non-Credit Compulsory Course]

Course Description: The purpose of this course is to comprehend the various ethical issues that may arise in one's professional life. The course will provide understanding of the expected professional ethics and behavior in diverse professional settings. It will also facilitate the students to develop detail insight on the different human values transmitted by diverse sources as constitution, culture, religion, family and society. On successful completion of the course the students will learn to acclimatize to the expectations of an ideal professional and a responsible member of the society.

Course Objectives:

- 1) To critically understand ethical issues as they pertain to professional and personal identity.
- 2) To learn to consider oneself and the world around from these basic ethical positions.
- 3) To develop sharpened analytical capabilities in order to develop and maintain a good interpersonal relationship in both professional and social space.

Unit-1: Ethics and Human Values

[8]

Definition, Importance and Relevance in present-day Society.

Indian Constitutional Values: Fundamental Rights and Duties; Freedom, Equality, Fraternity, Justice; Directive Principles of State Policy.

Religious and Cultural Values: Values embedded in different religions; Religious Tolerance.

Unit-2: Basic Human Virtues

[8]

Concept of Honesty, Punctuality, Responsibility, Courtesy, Discipline, Courage, Compassion, Empathy and Restrain

Family responsibilities: Duties as a Member of the Society, Guidance to youngsters; Gender Equality.

Social Concerns: Evils of Dowry & Caste System, Racial Discrimination, Suicidal Tendencies, Substance Abuse and Addiction.

Unit-3: Introduction to Professional Ethics

[8]

Need, Importance and Goals; Ethical Values in Different Professions: Dignity of Labour, Respect for Authority, Code of Conduct, Conflicts of Interest.

Occupational Crime; Sexual and Mental Harassment in work place.

Professional Rights: Employee Rights, Intellectual Property Rights (IPR).

Unit-4: Ethics in Professional and Global Space

[5]

Cyber Ethics and Etiquette.

Correct and Judicious use of Mobile Phones/electronic gadgets, Social Networking in professional space.

Environmental Ethics; Ethics in Research.

Suggested Readings:

1. Jayashree Suresh and B S Raghavan- *Human Values and Professional Ethics: Values and Ethics of Profession*. S Chand, 2005.
2. Martin, Clancy, Wayne Vaught, and Robert Solomon (eds.)- *Ethics Across the Professions: A Reader for Professional Ethics*. Oxford: Oxford University Press, 2010.
3. R.R. Gaur, R. Sangal and G.P. Bagaria- *A Foundation Course in Human Values and Professional Ethics* (Paperback). Excel Books, 2010
4. Terrence M. Kelly- *Professional Ethics: A Trust-Based Approach*. Lexington Books, 2018.
5. R. S. Naagarazan- *Professional Ethics and Human Values*. New Age International (Second ed.), 2019.

7. Teaching-learning Process for M.Sc. Biotechnology

It has been envisaged to impart of holistic knowledge and understanding of the various components of environmental Science and the interfaces and inter-linkages of all the aspects of local, regional, and global environment through the of M.Sc. Biotechnology programme. The learning process is expected to lead to the development of academic and professional skills necessary for professionals dealing with environmental issues in varied sectors – industry, academic, and government and non-government organizations. Development of critical thinking and decision making, empowered with skill, would be the key emphasis of teaching-learning for this programme.

The approaches to teaching-learning process under this programme would include lectures, seminars, tutorials, workshops, field-based study, practical and project-based learning adequately substantiated with laboratory-based experiments and industrial and field visits. The outcome-centric approach warrants promoting the transition from teacher-centric to learner- centric pedagogies. Adopted teaching strategies would encourage in developing problem- solving skills and higher-order skills of reasoning and analysis among the learners.

Teaching methods may include: lectures supported by group tutorial work; practical and field-based learning; utilization of prescribed textbooks and e-learning resources and other self-studymaterials;projectwork;andinternshipandvisitstofieldsites,andindustrialorother research facilities etc. The concerned faculty needs to stimulate the learning on a balanced apportionment of 30:30:40 norms. Here, lectures (listening/hearing) encompasses 30 percent of the delivery; audio-visuals (seeing/power point presentation/video/demonstrations) constitutes 30 percent of the learning mechanisms; and practice (doing/participating/discussion) 40 percent. However, the given ratio may be altered according to the specific needs of the respective Institution/University. The teacher may also have the freedom to develop or evolve any other knowledge transfer method for achieving the basic goals of focused learning and holistic development. The following broad approaches are suggested for comprehensive outcome oriented and participative learning.

Lectures: Lectures may be schemed to offer the learners the up-to-date contexts on the subject matter, which is interactive and involving students in joining hands with their teachers to get new insights of the subject. The teacher may postulate the lecture outcomes in the beginning of the lectures and subsequently summarize the major aspects covered during the lecture at the end to keep the focus on the outcome.

Field visits: Wherever there is scope, visit to research organization, research laboratories and industries

Laboratory Sessions: Laboratory sessions are important to train a student to follow specific procedures for obtaining scheduled outcome. This helps students gain confidence on the theoretical knowledge obtained from lectures and self-studies and adept them to handle equipment, learn standard techniques, collect and interpret data, and write reports. For the improvement of the lab experience of the students following should be implemented:

Simulations: Student may be given adequate hands on exposure to work some computational tools/software.

Problem solving: Apart from the standardized procedure given in laboratory manuals, student could be assigned with a scientific problem for encouraging them in formulating their own way to solve the given problem. *Laboratory Report:* The Laboratory report should clearly reflect the student's experience and their understanding on the science behind the experiments. Report writing helps students to collate the ideas and findings. In general, a laboratory report may be systematically organized in various sections as *Introduction, Procedure, Results, and Conclusion/Interpretation* of the obtained results. The *Introduction* section would define the problem statement, establish scientific concept, and provide logical reasoning. *Results* must begin with effective statements of overall findings and results must be presented visually, clearly and accurately. The *conclusion* section must reflect the intrinsic values of the results.

Project-based learning:

Project-based learning offers an opportunity to the students to work independently under guidance of a supervisor. Students may be assigned to the respective faculty members under whose guidance he or she would work on a problem keeping the focus to enhance their (students') ability to critical thinking, identification of research problems and research gaps, formulate research objectives, formulation of research plan, and problem solving via execution of specific experiments, and develop specialized skills to handle specific problems. This would train the students to nurture their creativity and innovative ideas, collaboration/teamwork and leadership, communications, learning self-reliance and project management. Adequate assessment requirements for individual marking are presentations with discussions and seminars on the working process and the results.

Summer training/internship: Students may be allowed to work as summer trainee or interns in other institutes/ laboratories/ industries depending upon the scopes and availability during summer/winter recess.

After the period of training, it is expected that students achieve the following:

- Recognize the duties, responsibilities and ethics at a professional position
- Ability to prepare technical reports for the training.
- Ability to apply knowledge learned to solve specific problems in relevant domain of science.
- Gain exposure and practical experience in the relevant field
- Ability to communicate effectively in the work environment.

Assessment Methods

Under the perspectives of the diversity in learning and pedagogical methods adopted by different universities and institutions, universities are expected to ensure that the assessment tools are satisfactorily rendering clear information about the attainment level of course outcomes and program outcomes for each and every student.

Assessment priorities: Institutions must prioritize formative assessments (in semester activities including tests done at the department or instructor level) rather than giving heavy and final weightage to summative assessments (end-semester). Progress of learners towards achieving learning outcomes may be assessed making creative use of the following either independently or in combination:

- Time-constrained examinations (say 1-hour or 2-hour tests)
- Closed-book and open-book tests (if applicable)
- Problem based assignments/ term papers
- Quizzes
- Lab reports
- Individual/Team assignments
- Oral presentations, including seminar presentation
- Viva voce
- Peer and self-assessment etc.
- Any other pedagogic approaches as may be relevant keeping in view the learner's level,
- Credit load and class size.

Weightage Distribution: In view of the need for more activity centric evaluation, more marks may be

assigned for in-semester i.e. internal evaluation. The distribution of marks in in-semester and end-semester examination should preferably be in the ratio of 40:60. End Semester Examination: The semester end examination must focus on evaluating the problem solving, critical thinking and skill abilities of the students. The scope and priorities may be decided on the basis of the learning outcomes of the respective courses.

(Institutions are expected to encourage instructors to bring in innovative and flexible methods to guarantee the fullest realization of Learning Outcomes outlined in the document. All such instructional and assessment requirements must be clearly communicated to all stakeholders at the time of course registration. Any subsequent change or minor modification necessary for fuller realization of learning outcomes must be arranged with due notice and institutional arrangement at the relevant level.

Freedom and accountability of the stakeholder are key attributes that determine the success of the Learning Outcomes framework. The excellence of institutions will be increasingly determined by Learning Outcomes rather than programme or course objectives. Hence it is necessary to innovate continually in learning and assessment in order to ensure meaningful and socially relevant learning (with transparent Learning Outcomes indices) rather than rote learning.)

SYLLABUS

MASTER OF SOCIAL WORK



AS PER NEW EDUCATION POLICY 2020

Effective from Academic Session: 2021-2022

Department of Social Work

**University of Science and Technology
Meghalaya**

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Acknowledgement

This revised post graduate programme in social work (MSW) is the result of tireless work by the Working Group Committee that started with a critical review of the existing Postgraduate programme. The NEP 2020 framework has been carefully scrutinized. The Courses Committee also held meetings and had detailed discussion on this proposed programme. As per the guidelines of the University, the Course Coordinator and Working Group Members participate in the course revision process.

1
2
3

The main task was to revise the existing MSW programme of University of Science and Technology Meghalaya in the light of UGC's NEP2020 curriculum in fulfillment of UGC requirements.

**Head of the Department
Department of Social Work
University of Science and Technology Meghalaya**

1. Introduction

The department of Social Work was established in 2011 with the aim of educating students in the field of Social Work. It orients the students on the aspects of field work and research to improve the quality of life and development of the potential of each individual, group and community at large. The academic and corporate life of the Department is marked by multifaceted initiatives; collaborative endeavors; innovative efforts of student learning and faculty enrichment; as also need based developmental interventions. The Department played a pioneering role in hosting a diversity of initiatives independently and in partnership with several governmental and non - governmental organizations. It continues to strive towards building an enabling environment that encourages self-exploration and self-expression among the students and research scholars, stimulating their young minds to nurture a culture that respects hard work, perseverance, diversity and inclusion.

VISION: By developing human resources for professional social work practice, strive for the creation of a just and equal society which ensures freedom from all forms of oppression and exploitation.

MISSION: To develop human resources for competent and effective professional social work practice, teaching and research with diverse range of individuals, groups and communities by using a framework of social justice and human rights focused on sustainable and participatory development.

2. Learning Outcomes Based Approach as per NEP'2020

As per NEP 2020 guideline department framed the current curriculum. Before that department adopted the Learning Outcome Based Curriculum Framework (LOCF) in social work for one year only which was grounded in place of earlier Choice Based Credit System (CBCS). The fundamental premise underlying the learning approach as per NEP is that higher education qualifications such as a Two Year Masters programme is awarded on the basis of demonstrated achievement in terms of interdisciplinary knowledge, understanding, skills, attitudes and values and academic standards expected of graduates of a programme of study. It specifies what Post-graduate students completing a particular programme of study are expected to know, understand and be able to do at the end of their programme of study. The end result at the post-graduate level is reflected in terms of Post-Graduate Attributes, Qualification Descriptors, Programme specific Outcomes, and Course Learning Outcomes which will be discussed later.

The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed. As per the guidelines, the curriculum is based on the following:

1. DMJ: Disciplinary Major
2. DMN: Disciplinary Minor
3. IDMN : Inter- Disciplinary Minor
4. CCEC: Compulsory Community Engagement Course
5. ALIF: Apprenticeship/Lab/Internship/Field project
6. DIS : Dissertation

3. Nature and Extent of the Programme

The degree will be Master of Social Work after 2 years. The proposed programme shall be governed by the University of Science and Technology Meghalaya. MSW programme is a practice based discipline that prepares its students for achieving the objectives through interventions in real life situations, which are dynamic in nature. The programme offers individualized mentoring to every student and comprises of classroom teaching involving interactive pedagogy and field work practicum. The classroom teaching is directed towards familiarizing the students with interdisciplinary theoretical perspectives, principles and skills required for social work interventions. It aims to develop student's personality through inculcation of democratic, humanitarian attitude and values. The four days of the week are devoted to classroom teaching experience and two days for the Field Work practicum. Field work practicum in social work is different from other social sciences. It is an integral part of social work education. Field work practicum settings are agencies and community based practice in which students are engaged in understanding various development projects, services and social work interventions. Field work is a practical experience which is purposively arranged for the students. In field work, field will be a setting (a social welfare and/or development agency or open community) which offers avenues for student's interaction with client and client system to apply social work methods, principles, skills and techniques under the guidance of faculty of the respective colleges and practitioner of the agency.

4. Aims of the Programme:

The overall aims of Post graduate programme in Social work are:

- To impart training in professional social work in order to develop human resources having competence to work with individuals, groups and communities for the promotion of welfare and development.
- To develop competencies with knowledge, skills and attitudes required for social work interventions.
- To develop the students as professional social worker with sensitivity towards social concerns and problems through inculcation of democratic and humanitarian values.

5. Post Graduate Attributes in Social work:

Post- Graduate Attributes These comprise a set of competencies, skills and abilities that the students acquire, along with disciplinary and inter-disciplinary know ledge through the educational programmes at the Department of Social Work. The graduate attributes at the Department can be classified under the following domains

- Intellectual Development: These comprise in-depth domain know ledge of social work, as also interdisciplinary perspectives, which underlie and contribute to social work education and practice; analytical competence; critical thinking; competence for research and innovation; problem solving competence; decision making ability; capacity for creativity; ability for autonomous functioning; acquisition of information technology skills, among others.
- Individual Development: These constitute inter-personal skills; communication competence; emotional intelligence; ability for team work; collaborative skills; leadership skills; time management competency; ability for self application and self investment, among others.
- Professional and Ethical Development: T hese include inculcation of professional at tributes and job skills of the social work profession; demonstration of integrity, honesty, responsibility and accountability towards the client systems and towards the profession; development of entrepreneurial skills, among others.
- Social Development: These comprise of development of cross cultural understanding; appreciation of diversity and inclusion; respect for social justice and human rights; integration of environmental consciousness; commitment for community and societal engagement, among others.

6. Qualification Descriptors

The qualification descriptors for Master of Social Work include the following:

- ❖ Demonstrate (i) a systematic, extensive and coherent knowledge and understanding of social work profession as a whole and its applications and ability to link the same to the other related disciplinary areas/subjects; including a critical understanding of the established theories, principles and concepts and of a number of advanced and emerging issues in social work; (ii) procedural knowledge that creates different types of professionals related to social work, including research and development, teaching and government and public service; (iii) skills in current developments in social work, including a critical understanding of the latest developments in social work education, and an ability to use established techniques of analysis and enquiry.
- ❖ Demonstrate comprehensive knowledge about materials, including current research, scholarly, and/or professional literature, relating to essential and advanced learning areas pertaining to social work and techniques and skills required for identifying problems and issues relating to it.
- ❖ Demonstrate skills in identifying information needs, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources, analysis and interpretation of data using methodologies as appropriate to the social work profession for formulating evidence-based solutions and arguments;

7. Programme Learning Outcomes

7.1 The broad learning outcomes of MSW programme are:

- ❖ To develop sensitivity towards issues of human rights and social justice.
- ❖ To familiarize the students with knowledge, skills and attitudes required for professional social work practice.
- ❖ To impart training in professional social work in order to develop human resources having competence to work with individuals, groups and communities for the promotion of welfare, justice and development.

7.2 Course-wise Learning Outcomes

The Master of Social Work (MSW) programme is designed to bridge the gap between theory and practice ensuring optimum learning by the students. The course intends to provide knowledge on the applications of Social Work profession in various settings and also equip students in applying their knowledge in their respective focus areas while working with communities and organizations. The programme enables the students to be facilitators of change by working with individuals, groups and communities. Through the programme, the students would acquire skills in analysis, problem solving, counseling, community organizing, management of projects and nonprofit organizations and also in social work research. The main objective of the program are as follows

- To impart training in professional social work in order to develop human resources having competence to work with individuals, groups and communities for the promotion of welfare and development.
- to develop competencies with knowledge, skills and attitudes required for social work intervention.
- To develop sensitivity towards social concerns and problems through inculcation of democratic and humanitarian values to act as professional social worker.

Course wise learning outcome mainly highlights the following

- The students will be trained in various filed work domains and perspectives that enhance necessary knowledge and growth.
- The students will be enabled to critically analyze, monitor and evaluate interventions.
- Ability to analyze, formulate, and advocate for policies that advance social well-being
- Ability to provide leadership in promoting sustainable changes in service delivery and practice to improve the quality of social services in various forms of settings.
- The students will be equipped with knowledge and competencies to work with people across communities having diverge cultural orientation and dynamics.
- The fields experiences complement in theoretical understanding that derive significant insight in greater identification of social issues and resources to deal with it.

8. Programme Structure:

The MSW programme is a two year course divided into four semesters. The programme is of 104 credits and for the award of degree a student will be required to complete the credits as per the University norm.

Part I	First Year	Semester I	Semester II
Part II	Second Year	Semester III	Semester IV

SEMESTER-I

Course Code	Title	Credit	Nature	Marks Allotted		
				Internal	End Semester	Total
MSW 101	Social Work Profession: History and Ideology (CC-1)	4	T	30	70	100
MSW102	Human Growth & Psychological Development (CC-2)	4	T	30	70	100
MSW 103	Working with Individuals (CC-3)	4	T	30	70	100
MSW 104	Community Health and Social Work Practice (DSE-1)	4	T	30	70	100
MSW 105	Development Communication and Professional skills for social work (SEC-1)	4	T	30	70	100
MSW 106	Field work (Orientation visit & Concurrent Field work) (P-1)	2+2 = 4	P	70	30	100
Total		24	-	220	380	600

SEMESTER-II

Course Code	Title	Credit	Nature	Marks Allotted		
				Internal	End Semester	Total
MSW 201	Industrial Relations and Corporate Social Responsibilities (CC-4)	4	T	30	70	100
MSW 202	Community Organization and Social Action (CC-5)	4	T	30	70	100
MSW 203	Working with Groups (CC-6)	4	T	30	70	100
MSW 204	Human Rights, Para legal education (GE-1)	4	T	30	70	100
MSW 205	Community Organization and Community Development (DSE-2)	4	T	30	70	100
MSW 206	Field Work (Concurrent Field work & Rural Education camp) (P-2)	3+1= 4	P	70	30	100
Total		24	-	220	380	600

SEMESTER-III

Course Code	Title	Credit	Nature	Marks Allotted		
				Internal	End Semester	Total
MSW 301	Social Work Research (CC-7)	4	T	30	70	100
MSW 302	Social Welfare Administration (CC-8)	4	T	30	70	100
MSW 303	MSW 303 Environment, Livelihoods and Sustainable Development (DSE-3)	4	T	30	70	100
MSW 304	MSW 304 (A) Rural Community Development (CC-9)	4	T	30	70	100
MSW 305	Dissertation (P-3)	4	P	30	70	100
MSW 306	Field Work (Concurrent Field Work & Study Tour) (P-4)	3+1=4	P	70	30	100
MSW 307	Management of Non-Governmental Organization (GE-2)	4	P	30	70	100

Total	28	-	250	450	700
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SEMESTER-IV

Course Code	Title	Credit	Nature	Marks Allotted		
				Internal	End Semester	Total
MSW 401	Introduction to Disabilities (CC-10)	4	T	30	70	100
MSW 402	Community Health and Social Work Practice(AECC-1)	4	T	30	70	100
MSW 403	MSW 403 (A) Tribal Community Development and tribal rights (CC-11)	4	T	30	70	100
MSW 404	MSW 404 (A) Urban Community Development (DSE-4)	4	P	30	70	100
	MSW 404 (B) Working with Families: Children, Youth and Aged (DSE-4)					
	MSW 404 (C) Women centric social work practice (DSE-4)					
MSW 405	Dissertation (P-5)	4	P	30	70	100
MSW 406	Field Work (Block Placement) (P-6)	4	P	70	30	100
MSW 407	Social Policy, Planning and Development (CC-12)	4	T	30	70	100
Total		28	-	250	450	700

CC: Core Courses;

SEC: Skill Enhancement Courses;

DSE: Discipline Specific Elective

AECC: Ability Enhancement Compulsory Course

GE: General Elective

CORE COURSES

1. Social Work Profession: History & Ideology
3. Community Health and Social Work Practice

2. Human Growth & Psychological Development
4. Industrial Relations and Corporate

5. Community Organization and Social Action
7. Social Work Research

9. Rural Community Development

11. Tribal Community Development and tribal rights

Social Responsibilities

6. Working with Vulnerable Groups

8. Social Welfare Administration

10. Introduction to Disabilities

12. Social Policy, Planning and
Development

GENERAL ELECTIVE (to be opted by other Department under the School of social science and school of law)

1. Human Rights, Para legal education
2. Community Organization and Community Development

SKILL ENHANCEMENT COURSES

1. Development communication and Professional skills for Social Work

DISCIPLINE SPECIFIC ELECTIVES :

1. Working with Individuals
2. Community Organization and Community Development
3. Environment, Livelihoods and Sustainable Development
4. Women centric social work practice

AECC: Ability Enhancement Compulsory Course

1. Community Health and Social Work Practice

9. Teaching-Learning Processes

The outcome based approach, particularly in the context of undergraduate studies, requires a significant shift from teacher-centered to learner-centric pedagogies and from passive to active/participatory pedagogies. This programme leads to well-structured and sequenced acquisition of knowledge and skills. Practical skills, including an appreciation of the link between theory and practice, will constitute an important aspect of the teaching-learning process. Teaching methods, guided by such a framework will include: lectures supported by group tutorial work; practicum and field-based learning, observations and field work to various organizations and communities. The use of prescribed classical, essential, suggested books, e-learning resources and other self-study materials will guide the teaching learning process. The other innovative methods would include: open-ended project work, some of which may be team-based; activities designed to promote the development of generic and subject-specific skills.

10. Assessment Methods

The progress of a student towards achievement of learning outcomes will be assessed by using the following: semester end examinations in time-bound manner; practical based assignments; library assignment; project assignment/case-study reports; group

assignment; oral presentations, including seminar presentation; field work viva voce; and self-assessment etc.

10.1 Scheme of Theory Examinations: The performance of the students will be assessed through two components: internal assessment and semester end examinations keeping in view the following:

- ❖ Internal Assessment: Attendance, class presentations, assignments (task based oral/or written), and class tests (30 marks).
- ❖ Semester End Examinations: Written examinations are of theory question paper pattern (70 marks). The semester end examinations shall be conducted as per the academic calendar notified by the University of Science and Technology Meghalaya

10.2 Assessment of Field Work: At the end of all the semesters, field work assessment will be done both internally and externally. The internal field work assessment is a continuous process. The students are required to submit their weekly report to the respective supervisors. Any delay in report submission will bring disadvantage to the students. Their learning will be monitored through weekly individual interactions with the assigned supervisors. The students will also be assessed on the basis of their performance for presenting their field work experienced based or scientific paper. At the end of the semester, students will be required to prepare a field work self-assessment report as per the guidelines in a prescribed form and submit the same to the respective college supervisors. The college supervisors will also prepare an assessment report regarding the performance of the concerned students on the basis of their learning and performance throughout the semester. Assessment of field work shall be on the basis of:

Field Work (Internal supervisors)	70 marks
Viva-Voce (External examiner)	30 marks

10.2.1 Internal Assessment of Field Work: The student would be assessed for efforts and progress towards task assigned in the learning process during the field work. The college supervisor is required to select the tasks systematically for the students. Then, the students with assistance from their respective college supervisor will develop a learning plan for field work that encompasses the agency specific activities.

11. Postgraduate Course in Social Work Based on LOCF

1. Title of the Degree in Social Work: The nomenclature of the degree shall be Master of Social Work (After 2 years)
2. Affiliation: The proposed programme shall be governed by the University of Science and Technology Meghalaya.
3. Mission: To impart knowledge, skills, techniques and attitude necessary for taking up the responsibilities both at grass-root and intermediate level management of social welfare and developmental services.

Course Wise Content Details for Master of Social Work (MSW) Programme

**MSW 101 Social Work Profession: History and Ideology Marks: 30 + 70=100
Total Credits: 4**

Objective: This course enables students to understand Social Work as a Profession and be familiar with the basic concepts which constitute important part of social work knowledge.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To become a professional practitioner of communication development tools

CO2: To advance the understanding of the concepts, goals, principles, programmes as well as methods and approaches of professional social work

CO3: To develop the concept of value, principle, ethics and model of social work

CO4: To understand the endorse different roles for bringing change in social work practice CO5:

To acquaint the basic concepts of Social Work

Course Contents:

Unit- I Introduction to Social Work

Concept-

- Social Work
- Social Service
- Social Reform
- Social Defence
- Social Welfare
- Social Action
- Social Policy

Relationship of social work with other social sciences.

Principles, objectives, Philosophy, Value, Assumptions, Code of Ethics and Scope of social work

Social Work as a profession, Social work process

Unit- II Histories and Ideologies of Social Work

History of social work in U.K, U.S.A and India:

- The Elizabethan Poor Law 1601
- Charity Organization Society 1869
- Settlement House Movement
- The poor Law commission of 1905,

India- Religio-Philosophical ideologies

- Gandhian philosophical foundation to social work in India

Indian Social reforms, social movements, state policies for development

Development of social work from charity to radical social work.

Unit- III Social Work Field and Methods

Fields of social work

- Family and child welfare
- Community development
- Human rights and child welfare, youth development
- Industrial social work
- Correctional administration
- Medical social work
- Psychiatric social work etc.

Methods of Social Work

- Case work
- Group work
- Community organization
- Social action
- Social work research
- Social welfare administration.

Field Work and its objectives

Intervention:

- Meaning
- Scopes
- Types of intervention.

Unit- IV Social Work Profession

Skills of social worker, Tools and Techniques, Role Played by socialworker

Social work education and its growth

Professional Association

- Indian Association of Schools of Social Work
- National Association of professional Social Workers in India

Suggested Reading:

1. Brenda Dubios and Karla (2002). Social-Work: An Empowering Profession. Keogsrud Miley
2. Bradford W.Sheafor and Charles (2006). Techniques and Guidelines for Social Work Practice. London: Allyn and Bacon

3. Bogo, Mario (2006). Social Work Practice: Concepts, Processes and Interviewing. Columbia University Press., Indian Reprint. New Delhi: Rawat Publications
4. Clack, G. & Asquith, S. (1985). Social Work and Social Philosophy. London: Routledge & Kogan Paul
5. Dasgupta, S. Ed. (1967). Towards a Philosophy of Social Works in India. New Delhi: Popular Book Service
6. Desai, Murli (2006). Ideologies and Social Work: Historical and Contemporary analyses. New Delhi: Rawat Publications
7. Friedlander, W.A. (1958). Concepts and Methods of Social Work. Englewood Cliffs: Prentice Hall
8. Ganguli, B.N. (1973). Gandhi's Social Philosophy. Delhi: Vikas Publishing House
9. Gore M.S. (1965). Social Work and Social Education. Bombay: Asia Publishing House
10. Gokhale, S.D. (1975). Social Welfare- Legend & Legacy. Bombay: Popular Prakshan
11. Skidmore, R.A & Thackeray, M.G. (1982). Introduction to Social Work Practice. New Jersey: Hall, Englewood, Cliffs
12. Desai, Murali (2004). Methodology of Progressive Social Work Education. New Delhi: Rawat Publication

MSW 102 Human Growth & Psychological Development

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the importance of Psychology in Social Work practice

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To understand human behaviour and its dynamics in the context of self and others CO2: To

understand basic concepts and theories related to human behaviour

CO3: To have a basic understanding on mental health

CO4: To develop the practical related knowledge, skills and attitudes of Social Work through application of theories and concepts of human behaviour

CO5: To understand the biological influences on human growth and behaviors

Course Content:

UNIT I Human Growth and Development

Understanding Reproduction, Prenatal development, Human Growth & Development

Stages of human Development: Infancy to old age

Role of Heredity and Environment

- Concepts
- Mechanisms,

Principles of growth and development

UNIT II Basic Psychological Concepts

Basic concepts

- Emotions
- Sentiments
- Memory
- Creativity
- Aptitude
- Attitude
- Sensation and perception(nature, process and fact)

Motivation, needs, Drives and Motives theories and motives, Maslow's Hierarchy of Needs

Adjustment and Maladjustment

- Meaning and characteristics
- Adjustment at personal, social and other levels

Adjustment by trial and error

- Adjustment solution; stress, frustration and conflict and their consequence
- Typical adjustment mechanisms

UNIT III Theories of Personality

Personality

- Definition
- Determinants and Dynamics of personality

Theories of Personality

- Al port's Theory
- Humanistic theory of Rogers
- Freud's psychosexual theory
- Psycho- social theory of Erickson

Piaget's theory of Cognitive development

Classical conditioning and operant conditioning

UNIT IV Life span and Social Work Practice

Understanding the Indian concept of life span stages

Apply theory and knowledge of life span development to social work practice

Relevance of social work practices in all stages of development, needs, tasks, problems and services

Suggested Reading

1. Hurlock, E. B. (2002). Personality Development. New Delhi: Tata McGraw- Hill Education
2. Rayner, E. (2002). Human Development: An Introduction to the Psychodynamics of Growth, Maturity and Ageing. New Delhi: Routledge
3. Sudbury, J. (2009). Human Growth and Development: An Introduction to Social Workers. Taylor and Francis
4. Kuppaswamy, B. (1961). Introduction to Social Psychology. Bombay: Asia Publishing House
5. Bisacre, M. & Carlisle, R. (1975). The Illustrated Encyclopedia of Human Development (Ed.). London: Marshall Govendish Books Ltd.,
6. Brophy, J.E. (1977). Child Development and Socialization. Chicago: Science Research Associations
7. Clifford, M. & King, R. (1975). Introduction to Psychology. New York: McGraw Hill Inc.
8. Hall, C.S. & Linzey, G. (1978). Theories of Personality. New York: Wiley
9. Hurlock, Elizabeth B. (1975). Development Psychology. (New Delhi: Tata McGraw-Hill Publishing Company
10. Coleman, James C. (1976). Abnormal Psychology and Modern Life. Bombay: D.B. Taraporevala sons and Co.,

MSW 103 Basic Sociological Concepts

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the importance of Sociology in Social work practice and the relationship between Sociology and Social Work.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To understand the basic components of society

CO2: To understand the social phenomenon

CO3: To build critical reflection and analysis about the different society

CO4: To capacitate and build skills for social work intervention at different levels CO5:

To acquaint the basic sociological concepts

Course Content:

UNIT I: Introduction to basic concepts

Understanding society

- Meaning

Characteristics

- Differences
- Role and Status (Meaning and nature, Social status, Ascribed and achieved status)

Social structure and Function

- Elements of social structure
- Concept of function
- Social functions and Dysfunctions

Society and Culture

- Individual and society
- Hereditary and environment
- Socialization
- Elements of culture- symbols, language, norms, values, and artifacts

UNIT II: Social Norms and Values

Social groups

- Meaning and types, Primary and secondary groups, In group-out group and reference group)

Social norms and values

- Meaning and definition of both, functions and importance

Social conformity and Deviance

Social Control

- Meaning
- Definition
- Purposes
- Agencies of social control

UNIT III: Social stratification in Indian Society

Social institutions

- Marriage
- Family
- Kinship system
- Education system
- Economic System
- Political System
- Religion

Social classification and stratification of Indian society

- Tribe

Caste

- Class
- Race
- Ethnicity
- Social mobility

Understanding Indian society, Composition of Indian society

UNIT IV: Social Problems and Social Change

Meaning and nature of social change (Global to local)

Theories and factors of social change

- Structuralism
- Functionalism
- Marxist

Social Problems in India and Northeast India

Social movements (Social movements in India)

Suggested Reading

1. Davis, K. (1969). Human Society. New York: The Macmillan
2. Gupta, D. (1997). Social Stratification (ed). New Delhi: Oxford University Press
3. Cohen, A.K. (1968). Deviance and Control. New Delhi: Prentice Hall India
4. Merton, R.K. (1968). Social Theory and Social Structure. New York: The Free Press
5. Uberoi, P. (1997). Family, Kinship and Marriage in India. New Delhi: Oxford University Press
6. Ahuja, R. (1999). Society in India. Jaipur: Rawat Publications
7. Madan, G.R. (1994). Indian Social Problems, Vol. I and Vol. II. New Delhi: Allied Pub. Pvt. Ltd.,
8. Parsad, B.K. (2004). Social Problems in India. New Delhi: Anmol Publications
9. Singh, Y. (1997). Social Stratification in India. New Delhi: Manohar Publications
10. Shah, G. (2000). Social Movement in India: Review of Literature. New Delhi: Sage

MSW 104 Working with Individuals

**Marks: 30 + 70=100
Total Credits: 4**

Objective: This course enables students to understand different approaches models in working with individuals in different situations.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the values, Principles and scope of Social Case Work and to develop the capacity to practice them

CO2: To understand and apply the approaches & models of Social Case Work practice in different settings

C03: To develop an understanding of and an ability to adopt a multi-dimensional approach in assessment and interventions

C04: To develop a holistic understanding of counseling as a tool for help C05: To

develop a holistic understanding of counseling as a tool for help

Course Contents:

UNIT I: Social Casework as a method of Social Work

Social Case Work:

- Meaning, Definitions
- Scope, Purpose
- Historical Development
- Case work practice in India

Objectives of Social Case Work, Values, Philosophical Assumptions.

Principles of case work, components of case work

Case work process

UNIT II: Approaches and Models

Problem solving approach

Task centered approach

Person-in-environment

Crisis intervention

Application of these approaches to understand clients and their contexts

UNIT III: Tools, Techniques and skills

Tools

- listening, observation, Interview
- home visits, collateral contacts, referrals

Techniques in practice

- Ventilation
- emotional support
- action oriented support
- advocacy
- environment modification
- modeling
- role-playing
- confrontation

Case history taking

- Record keeping – Face sheet, Narrative, Process and Summary recording.

Relationship in Social Case Work

UNIT IV: Application of Case Work

Social Case Work and Indian Social Condition

Application of Social Case work in Different Settings.

Roles of Case Worker

Self as a professional

Suggested Reading

1. Perlman, H.H. (1957). Social Case Work: A Problem Solving Process. Chicago: University of Chicago Press
2. Mathew, G. (1992). An Introduction to Social Case Work. Bombay: Tata Institute of Social Sciences
3. Hamilton, G. (2012). Theory and Practice of Social Casework (Second edition revised). New York: Columbia University Press
4. Fook, J. (1993). Radical Case Work: A Theory of Practice. Allen and Unwin
5. Bhattacharya, S. (2009). Social case work administration and development. New Delhi: Rawat Publications
6. Upashya, R. K. (2003). Social Casework: A therapeutic approach. New Delhi: Rawat Publications
7. Mujawar, W.R. & Sadar N. K. (2010). Field work training in social work. New Delhi: Mangalam Publications
8. Trevithick, P. (2000). Social work skills: A practice handbook. Open University Press
9. Segal, E.A. (2010). Professional Social work. New Delhi: Cengage Learning India Pvt. Ltd.,

MSW 105 Development Communications and Professional Skills for Social Work

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand Social Work as a Profession and be familiar with the basic concepts which constitute important part of social work knowledge.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To understand the concept of Personality Development

CO2: To understand and develop the skill of Time Management

CO3: To understand the concept of Communication in the context of Development

CO4: To gain expertise in the area of communication development

CO5: To become a professional practitioner of communication development tools

Course Content

Unit I Communication Development

Communication

- Concept
- principles and its significance

Effective and Efficient Communication

1.3.Communication Modes and Media

1.4 Barriers to communication

Unit II Motivation, Reinforcement and Work Performance

Motive, Motivation and Motivating

Maslow's Hierarchy of Needs

Reinforcement and its Strategies

Managerial Tools for Motivating Employees in Indian Organisations.

Unit III Media and its role

Mass Media:

- Television, Growth and changing focus of television in India, analyses, attitudes and values conveyed by TV programmes, strengths and limitations of TV as a tool for development;

Newspapers:

- Historical role of newspapers in development, current trends, letters to the editor, strengths and limitations of the press as a tool for development;

Radio:

- Growth of radio in India, analyses of development programmes on the radio, strengths and limitations of radio as a tool for development

Advertising:

- Analysis of Advertisements focusing on appeals, used and ethics involved

Unit IV Application of Media in Community

Application of Media in various Community Setting

ICT: Use of ICT in Development sector.

Poster Making, Developing of learning materials

Suggested Reading

1. Hergenhahn, B. R., & Olson., M. H. (2003). An Introduction to Theories of Personality. New Jersey: Prentice-Hall
2. McCorkie S. & Reese M.I. (2009). Personal Conflict Management: Theory and Practice

Pearson

3. Vroom, V.H. & Jago, A.G (1988). The New Leadership: Managing Participation in Organizations. New Jersey: Prentice-Hall.
4. Doctor, Aspie et al. (1984). Basic study in Mass Communication. Mumbai: Seth Publishers
5. Kumar, Keval (1991). Mass Communication in India. Mumbai: Jaico Publishing House
6. Mody, B. (1991). Designing Messages for Development Communication: An Audience Participation Based Approach. New Delhi: Sage Publications
7. Hoppe, Michael.H. (2006). Active Listening: Improve your ability and lead, Strategies. Atlantic
8. Melkote, Srinivas. (1991). Communication for Development in the Third World, Theory and Practice. New Delhi: Sage Publications
9. Stipek, D. J. (1993). Motivation to learn: From theory to practice. Boston: Allyn & Bacon
10. Copley, P. (2006). Communication Theories. Routledge

MSW 106

Field Work

Marks: 70 + 30=100

Total Credits: 4

(Orientation Visits & Concurrent Field Work)

Objective: This course provides students the opportunity to work in a professional setting to develop and demonstrate skills in social work, to integrate the theories and practices learned in and out of the classroom, to develop a sense of commitment to the social work profession and Code of Ethics, to develop an understanding of the diversity of a community population and the role of diversity in social work practice, to develop an understanding of how administrative processes and policies impact delivery of services, to develop professional relationships within the community to better understand local resources to benefit future clients, and to confirm personal interests and abilities in the social service field.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To acquire theoretical knowledge and develop the capacity to translate theory into practice

CO2: To understand of community situations using skills of observation, interaction and situation analysis

CO3: To develop of social work intervention skills

CO4: To acquire skills of systematic observation and develop a spirit of enquiry CO5:

To undertake learning within the reality of life

- Orientation Visits (7) to various settings
- Concurrent Field Work (Rural/Urban open community Setting) 20 days

MSW 201 Working with Groups

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to develop the knowledge, competencies and values required by social work students while working with groups of people.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To engage with Individuals, Families, Groups, Organizations, and Communities

CO2: To substantively and affectively prepare for action with individuals, families, groups, organizations, and communities

CO3: To assess Individuals, Families, Groups, Organizations, and Communities

CO4: To intervene with Individuals, Families, Groups, Organizations, and Communities

CO5: To develop awareness about the specific characteristics of Group Work and its contributions as a method of social work intervention

Course Contents:

Unit-I: Introduction and History of Social Group Work

Social Group Work

- Definition, Concept

Historical development of group work, Group work Objectives and values

Group work Principles and Models of group work practice

Techniques and skills in group work ,Group worker: roles and functions

Unit-II: Group Dynamics and Group Development

Group dynamics

Decision-making and problem solving

Responsibilities of group leader

Stages of group Development: Forming, Storming, Norming, Performing and Adjourning

Theories of Social Group Work

Unit-III: Settings and Sites of Group Work

Group work with different groups- Children, persons with disability, youth, older

Roles of Group Worker in different setting

Unit-IV: Tools and Techniques in Group Work

Use of programme media

Group work recording

Self as professional

Suggested Reading

1. Trecker, H.B.(1970). Social Group Work – Principles and Practices. New York: Association Press
2. Wilson, G. and Ryland, G.(1949). Social Group Work Practice. Boston: Houghton Mifflin Co.,
3. Siddiqui, H.Y. (2007). Social Group Work. New Delhi: Rawat Publications
4. Konopka, G. (1983). Social Group Work: A Helping Process (3rd Edn.). Prentice – Hall, Inc. J.J.
5. Douglas, T. (1976). Group Process in Social Work – a Theoretical synthesis. New York: John Willy & Sons
6. GOI. (1987). Encyclopedia of Social Work in India (Vol 1-4). New Delhi: Ministry of Information & Broadcasting,
7. Battacharya, Sanjay. (2010). Social Work an Integrated Approach. New Delhi: Deep & Deep Publications.
8. Gravin, Charles. D. Lorriae& M. Gulier. (2007). A Hand Book of Social Work with Groups .New Delhi: Rawat Publications
9. Jha, Jainendra Kumar. (2010). Encyclopedia of Social Work. New Delhi: Anmol Publications
10. Shaw, Marllin E. (2002). Group Dynamics. New Delhi: Tata – McGraw Hill

MSW 202 Community Organization and Social Action

**Marks: 30 + 70=100
Total Credits: 4**

Objective: This course enables students to understand the community dynamics and develop intervention strategies for several issues in the community.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To understand the concept of community organization and social action

CO2: To understand the concept need principles process and strategies of community work

CO3: To develop understanding of the different approaches and various models of community organization and social action with a special reference to Indian situation

CO4: To formulate macro interventions, advocate for and work collaboratively in change and capacity building processes

CO5: To understand the difference between community organisation and community development

Course Content

Unit I –Introduction and History of Communities

Definitions and understanding of communities, types of communities.

Analysing Community:

- Concept of community
- Structure & Functions
- Deconstruction of community
- Analysing Communities.

Community organization and community Development.

Changing communities

- Communities as sites of identity, inclusion and exclusion

The Indian Village as perceived by Phule, Ambedkar and Gandhi.

UNIT II- Models of Community Organization and Emerging Issues.

Understanding Community Organization Practice:

- Definition
- Values & principle and Ethics of Community organisation Practice

Models of Community organisation:

- Overview of Rothman
- Critique of Rothman Models
- Bidels & Bidels Models

Caste and class in the traditional village, the changing villages and emerging issues

Urbanization and Growth of slum Communities

The changing socio-demographic profile of cities and emerging issues

UNIT III: Approaches and structure of Community Organization

Approaches to community organisation

Community Dynamic

- Power Structure
- Relevance and Concept and types of leadership

Understanding conflicts in communities & strategies of conflict resolution

UNIT IV: Social Action

Social Action:

- Objective and scope, Principles
- Social action as method of social work

Rights-Based Approach and social action

Participatory rural appraisal (PRA)

Skills for Community Organization, Discussion of case studies in Community Organisation and Social Action

Suggested Reading

1. Ross, M.G. (1997). Community Organization: Theory, Principles and Practice. Harner and

Row

2. Siddique, H.Y. (2006). Community and Social Action. Jaipur: Rawat Publication
3. Gore, M.S. (2009). Social Work and Social Work Education. Bombay: Asia Publishing House
4. Friedlander, W.A. (2010). Concepts and Methods of Social Work. Eaglewood Cliffs, Prentice Hall
5. Siddique, H.Y. (1984). Social Work and Social Action. New Delhi: Harnam Publications
6. Butcher, Hugh. & others. (1998). Community Groups in Action. London: Rutledge and Kegan Paul
7. Schneider, R.L. & Lester, L. (2001). Social Work Advocacy: A New framework for Action. Belmont/CA: Brooks/Cole
8. Desai, M. (2006). Ideologies and Social Work: Historical and Contemporary analyses. New Delhi: Rawat Publication

MSW 203 Working with Vulnerable Groups

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to capacitate and build skills for social work intervention at different levels.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To be sensitized about different vulnerable groups

CO2: To be aware of the different programmes and policies for the vulnerable groups CO3:

To develop analytical skills while working with vulnerable groups

CO4: To build capacity for critical reflection and analysis of the issues pertaining to vulnerable groups of society

CO5: To develop skills for intervention at different levels

Course Contents

Unit-I Women and Special laws for protection of Women

Status and Identification of problems of women

- Conflict areas, migration, displacement, oppressive social and cultural customs.

Human rights and women rights

- International and national

Laws for protection of women:

- Maternity benefit Act(1961)
- Dowry Prohibition Act (1961)
- Equal Remuneration Act(1976)
- Medical Termination of Pregnancy Act(1976)
- Domestic Violence Act 2005
- Sexual harassment of women at workplace act.

Women empowerment policies and programs for poverty alleviation, economic empowerment

- SHGs
- CEDAW
- Gender budgeting
- National and state commissions for women,

Social work intervention with women (Institution and Non-institution)

Unit- II: Children and Special laws for protection of children

Status and Identification of problems of children

Human rights and children rights

- International and national

Laws for protection of children:

- Child Labour Act(1987)
- Children's Act(1960)
- Juvenile Justice (care and protection) Act 2000
- Prohibition of Child Marriage Act 2006
- Right to Education Act 2009
- Protection of children from sexual offences Act (POSCO), JJ Act 2015
- UNCRC etc

Social work intervention for children (Institutional and Non- institutional)

Unit-III Physically challenged and Laws for protection of Physically challenged

Status and identification

- Physically challenged (Physical, MR, HI, VI)

Human Rights and physically challenged rights- International and national

Laws for protection of physically challenged.

National and state commissions for physically challenged

Social work intervention (Institutional and Non-institutional).

Unit- IV Constitutional Provisions and interventions for SCs/STs and religious minority

Status and identification of Communities under SCs/STs and religious minority

Laws for protection of SCs/STs and religious minority

- Civil rights
- SC/ST Atrocities Act (1989)
- 5th and 6th Schedule, PESA

Programmes and Provisions for SCs/STs and religious minority.

Social work intervention (Institutional and Non-institutional)

Suggested Reading

1. Cohen, L.G. & Spencier, L.J. (2003). Assessment of children and youth with special needs. Boston: Alley and Bacon
2. Desai, K.G. (1982). Ageing in India. Bombay: TISS Series 52
3. Desai, M.M. and Khetani, M.D. (Editors. Morton, I.T. Seicher, Daniel Thursz and Joseph L.). (1979). Intervention Strategies for the Aged in India" In Reaching the Aged- Social Services in Forty-four countries. London: Beverly Hills
4. Hancock, B. L. (1990). Social Work with Older People. New Jersey: Prentice-Hall

5. Dutta R K. (2003). Crime against Women. New Delhi: Reference Press
6. Glicken, M.D & Sechrest, Dale K. (2003). The Role of the Helping Professions in treating the victims and perpetrators of Violence. New York: Allyn and Bacon
7. Roy, S. (2010). Women in Contemporary India: Realities and Perspectives. New Delhi: Akansha Publication
8. Beckett, C. (2003). Child Protection: An Introduction. New Delhi: Sage Publications
9. Rose, S.R. & Fatout, M. (2003). Social Work Practice with Children and Adolescent. Boston: Allyn & Bacon
10. Joshi, S.C. (2006). Child Labour: Issues, Challenges and Laws. New Delhi: Akansha Publishing House
11. Bhattacharya, S. (2008). Social Work Interventions and Management. New Delhi: Deep & Deep Publication
12. Jagan, K. (2008). Development of Scheduled Castes and Scheduled Tribes in India. Cambridge Scholars Pub
13. Jagan, K. (2009). Occupational Mobility among SCs. Cambridge Scholars Pub
14. Munice, J. (2009). Youth and Crime. Sage Publication
15. Jacober, A.E. (2011). The Adolescent Journey: An Interdisciplinary Approach to Practical Youth. InterVarsity Press
16. Kant, A. (1997). Women and the Law. APH Publication Co.
17. Bhasin, K. & Khan, S.N. (1986). Gender Basics- Feminism and its relevance in South Asia. Women Unlimited
18. Siddiqui, H.Y. (1997). Working with Communities. Hira Publications

MSW 204 Human Rights, Para Legal education and Social Work Practice

Marks: 30 + 70 = 100

Total Credits: 4

Objective: This course enables students to understand human rights, value human rights, and take responsibility for respecting, defending, and promoting human right

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To develop the understanding of law and legal system of India

CO2: To develop the understanding of human right and social justice

CO3: To get knowledge of constitutional and statutory provisions for different section of society CO4:

To understand the importance of human rights in social work

CO5: To develop awareness of how human rights can be translated into social and political reality

Course Contents

Unit I Human Rights and Duties

Human rights:

- Concept, Characteristics, Civil, Political & Cultural Rights
- Historical development, generations of human rights
- International Bill of Rights

Human Rights in India:

- Evolution of the concept of Human Rights
- Constitution of India and Human Rights: Fundamental Rights and DPSP
- The Protection of Human Rights Act, 1993

Unit II Social Justice

Social Justice:

- Concept, meaning and scope,

Thoughts of Miller, Rawls and Karl Marks. Sen

Issues of social Justice in Indian society, Inequality: social, Political and Economic.

Unit III Social Legislation

Law-Definition and need, Social Legislation:

- Meaning, needs and scope
- Social legislation as an instrument for social control, social change, social justice, social defense and social reform.

Legislation relating to women:

- Domestic Violence
- Dowry, Indecent representation
- Sexual Harassment at workplace

Legislation relating to Children:

- Juvenile Justice
- Child Labour, Right to education
- Child marriage
- Immoral Trafficking
- Aged and Person with Disabilities

Unit IV Para Legal Education and social work intervention

Meaning of Para legal education, concept of :

- Family Courts

- Lok Adalats
- Legal Aid
- Public Interest Litigation
- Legal Service authority (National and State)
- Right To Information
- Bail
- FIR
- Parole
- Prison justice,

Role of NGO:

- Role of NGO in promotion and protection of rights of women, children and other weaker section of the society, Advocacy, Campaign, Lobbying, Networking.

Role of Social Worker:

- Social Work and Human Rights, Right based intervention

Suggested Reading

1. Singh, S. (2010). Legal Aid-Human Rights to Equality. Delhi: Deep and Deep, Publication
2. Subramaniam, S. (2007). Human Rights- International Challenges. New Delhi: Manes Publications
3. Gangrade, K.D. (2008). Social Legislation In India Vol. 1 & 2. New Delhi: Concept Publishing Co.,
4. Bhattacharji, A. (1997). Social Justice and the Indian Constitution. Simla Indian Institute of Advanced Studies
5. Ife, J. (2001). Human Rights and Social Work: Towards Rights-based Practice. UK: Cambridge University Press
6. Nirmal, C.J. (1999). Human Rights in India – Historical, Social and Political Perspectives. Delhi: Oxford University Press
7. Gupta, H.N. (2006). Social Security Legislation for Labour in India. Delhi: Deep and Deep Publication
8. Iyer, Krishna V.K. (2007). Social Justice; Sunset or Dawn. Lucknow: Eastern Book Company
9. Uperdra, B. (2012). Perspectives in Development; Law, the Crises of Indian Legal System. New Delhi: Vikas Publication

Objective: This course enables students to understand the concept, content and process of social development and understand the different models of Social Development

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To develop a critical understanding of the nature and sources of social policy

CO2: To understand the major ideologies which influence social policy, planning and development

CO3: To understand the different models of social development

CO4: To develop the ability to conceptualize the different approaches of development CO5:

To be aware different approaches of development

Course Contents Unit

I: Social Policy

Meaning and Objectives of Social Policy

Sources of Social Policy

Models of Social Policy

Factors Influencing Policy Formulation

Unit 2: Social Planning

Meaning, Objectives and Process of Social Planning

Strategies in Social Planning

Social Planning in India: Centre, State, District and Block

Planning Commission, National Development Council, Programme Evaluation Organization, The Committee on Plan Projects.

Understanding Govt. Policies: Population Education and Health

Unit 3: Strategies of Social Development

Concept and Indicators of Social Development

Approaches and Strategies : Growth and Equity, Minimum Needs, Quality of Life

Models of Social Development

Basic Needs of Social Development

Dilemmas of Development

Unit 4: Approaches to Development

Sustainable development: Meaning & Concept, Evolution, Components, Factors, Innovative Approaches

Gandhian Approach to Development

Human Development Approach

Role and scope of Social Work in Social Policy, Planning and Social Development

Suggested Reading

1. Jacob, K.K. Social Development Perspectives. Himanshu Pub.
2. Kulkarni, P.D. & Nanavaty, M.C. Social Issues in Development. Uppal Publishing House.
3. Lavalette, Michael; Pratt, Alan (eds.) Social Policy: A Conceptual and Theoretical Introduction, (2nd edition). London: Sage Publications
4. Lewis, Gail; Gewirtz, S. Clarke, J (eds.) Rethinking Social Policy. London: Sage Publications Inc.,
5. Meadows, Donnell H. The Limits to Growth. New York: University Books
6. Midgley, J. Social development: the developmental perspective in social welfare. Delhi: Sage
7. Midgley, James; Livermore, M The Handbook of Social Policy. London: Sage Publications,
8. Mullard, M. and Spicker, P. Social Policy in a Changing Society. New York: Routledge & Kegan Paul
9. Pathak, S. Social Welfare : An Evolutionary and Developmental Perspective. Delhi: Mac Millan India
10. Patton, C.V.; Sawicki, D.S. Basic Methods of Policy Analysis and Planning. New Jersey: Prentice Hall Inc.,
11. Rogers, Peter P.; Jalal, Kazi F.; Boyd, John A. An Introduction to Sustainable Development Earthscan.
12. Sharma, P.N. and Shastri, C. Social Planning : Concepts and Techniques. Lucknow: Print House
13. Singh, Mohinder. Social Policy and Administration in India. M.D. Publications Pvt. Ltd.
14. Singh, R.R. (Ed.) Whither Social Development. Delhi: ASSWI
15. Titmus, R.M. Social Policy. London: George Allen & Unwin.

MSW 206**Field Work****Marks: 70 + 30=10****Total Credits: 4**

Objective: This course enables students to personally affirm the validity of content presented in the classroom. The progressive, reciprocal relationship between theory and conceptual frameworks and practice becomes a dynamic in the teaching-learning process of field instruction. **Course Outcomes:**

The Successful completion of this course shall enable the student:

CO1: To acquire theoretical knowledge and develop the capacity to translate theory into practice

CO2: To understand the practical implication of the methods of social work

CO3: To capture the complex issues of social exclusion at the grass root level

CO4: To develop appropriate strategies for Social Work interventions at different levels

CO5: To develop problem solving skills

Contents:

- Concurrent field work (25 days): Open community/organization

- Rural Education camp (5 to 7 days):Rural area

MSW 301 Social Work Research

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the introductory concepts and related knowledge and to understand the relevance of social work research.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To develop scientific approach to human inquiry

CO2: To develop understanding of social work research and its importance CO3:

To develop understanding of simple statistical tools and to learn to use CO4: To develop the ability to carry out a research study

CO5: To be able to apply research tools into practice

Course Content:

UNIT I Introduction

Social Work Research:

- Meaning and purpose of research

Philosophy and theory in social work research

Ethical issues inherent in all phases of the social work research process

Use of research in social work

UNIT II Research Design

Research questions and hypotheses; Problem formulation, identifying research variables and its attributes

Research design:

- Universe, Sampling
- Sampling fundamentals (Types of sampling designs Probability-based techniques, Non-probability sampling)
- Tools: Guidelines for asking questions, Questionnaire construction, Interview Schedule

Data collection, Data processing, analysis and interpretation, Report writing

Quantitative and qualitative research

UNIT III Statistical Tools

Measures of central tendency:

- Mean
- Median
- mode

Statistical tools:

Frequency Distributions

- Normal Distribution, Percentage, Ratios and Proportions
- Measures of Dispersion: range, quartile deviation, mean deviation, standard deviation; hypothesis testing, Chi-square test, T test; interpretation of findings.

MS Word, Excel

SPSS

UNIT IV Research Proposal Writing

Develop the Introduction, problem statement, research questions or hypothesis

Develop the Literature review

Develop the Research design

Presenting the research proposal

Suggested Reading

1. Laldas D.K. (2000). Practice of Social Research: Social Work Perspective. New Delhi: Rawat Publications
2. Young, Pauline V. (1982). Scientific Social Surveys and Research. New Delhi: Prentice- Hall of India Pvt. Ltd.,
3. Goode, W.J. & Hatt, P.K. (1952). Methods in Social Research. New York: McGraw Hill Book Company, Inc.,
4. Wilkinson, T.S. and Bhandarkar, P.L. (1984). Methodology and Techniques of Social Research. Bombay: Himalaya publishing House
5. McMillan, W. (1952). Statistical methods for Social workers. Chicago: University of Chicago press
6. Gupta, S.P. (1984). Statistical Methods. New Delhi: Sultan chand & Sons
7. Podgett, D. (1998). Qualitative Methods in Social Work Research. Challenges and Rewards. New Delhi: Sage Publications
8. Bruce, B. L. (1995). Qualitative Research Methods for the Social Sciences. Boston: Allyn and Bacon

MSW 302

Social Welfare Administration

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students will draw an understanding of Social Welfare Administration and will be equipped with legal and managerial skills for NGO management..

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To develop an insight into the concept and process of social welfare administration CO2:

To understand the structure & functions of social welfare administration organization C03: To understand the basic administrative processes and practices in India

C04: To understand the management of Non Governmental Organization C05:

To develop Project proposal writing skills

Course Contents:

Unit-I Introduction

Conceptual understanding of Social Welfare, Social Services, and Social Work

Social welfare administration

- Definition
- Features
- Scope
- principles;

Administrative processes

Welfare administration at central and state levels

- Central Social Welfare Board and State Social Welfare Boards, roles and functions

Unit-II Welfare Agencies

Welfare agencies such:

- Indian Council for Child Welfare (ICCW)
- YMCA
- YWCA
- Indian Red Cross Society - Roles & functions;

Role of voluntary agencies/NGOs in promotion of social welfare

Unit-III Introduction to NGO and CSR

Non-Governmental Organization

- Basics and History
- Types and Activities of NGOs;

Trust and Society

- Differences and Formations
- Registration procedure for NGOs
- Tax Reliefs under various Acts;

Corporate Social Responsibility; Social Marketing and Social Entrepreneurship

Major national and international NGOs,

Unit-IV Legal Procedure, Proposal Writing and Monitoring and Evaluation of NGO

Documents required for forming a Trust and a society, Contents of a Trust Deed;

Registration

- Indian Registration Act
 - Contents of the Memorandum of Association and Bye Laws of the Society
- Proposal Writing, Funding Activities and Project Documentation;
Monitoring and Evaluation of NGOs.

Suggested Reading

1. Goel, S.L. & Jain, R.K. (1988). Social Welfare Administration: Theory and Practice. (Vol. I & II). New Delhi: Deep and Deep Publications
2. Skidmore, R.A. (1994). Social Work Administration: Dynamic Management and Human Relationships. Pearson Education
3. Kohli, A.S. & Sharma, S.R. (1996). Encyclopedia of Social Welfare and Administration. Vol. 1 to 7. New Delhi: Anmol Publishing Pvt. Ltd.,
4. Chowdhry, P.D. (1983). Social Welfare Administration. Delhi: Atma Ram Sons
5. Chandra, S. (2001). Non-Governmental Organizations: Structure, Relevance and Function. New Delhi: Kanishka Publishers
6. Patti, R.J. (2000). The Handbook of Social Welfare Management. Sage Publications
7. Dadarwala, N.H. (2005). Good Governance and Effective Boards for Voluntary/Non- profit Organisations. New Delhi: CAP
8. PRIA. (2000). Defining Voluntary Sector in India: Voluntary Civil or Non-profit. New Delhi: PRIA
9. Padaki, V. & Vaz, M. (2004). Management Development and Non-profit Organizations. New Delhi: SAGE

MSW 303 (A)

Environment, Livelihoods and Sustainable Development

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the concept of community development and the concept of environment, livelihood and sustainable development with relation to social work practice.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand concepts of community development, ecology and environment

CO2: To advance the understanding of sustainable community development, its dimensions and sustainable livelihoods

CO3: To understand the inter-relationships among ecology, environment, livelihoods and sustainable development

CO4: To identify the social work intervention strategies for various environmental issues CO5:
To formulate intervention strategies for sustainable development

Course Content

Unit I: Community Development

Concept, definition, history & objectives of Community Development; Community development resources, Community capacity building; Community Development process, Community Development skills;
Community Resource Mobilization
Common Problems in Community Development;
Methods and approaches in community development

Unit II: Ecology & Environment in Community Development

Concepts, structure and functions of ecology and environment; Human ecology, hunger;
Traditional ecological knowledge and sustainable resource use;
Community rights over natural resources, Social ecology and Socio-ecological analyses of community problems;
Environmental issues

- Industrial pollution
- Climate change
- Disaster and CBDP and CBDM
- Environmental inequality
- Environmental movements

Unit III: Livelihoods

Concept and definition; Livelihood assets – natural resources, technologies, skills, knowledge and capacity, health status, access to education, sources of credit, networks of social support;
Common property resources (CPRs) – concept and definition;
Livelihoods and environment, Man-environment relationships for livelihoods in NE India.
National Livelihood Missions – Objectives, goals and strategies

Unit IV: Sustainable Development

Concepts of sustainable development, sustainability, equity & social justice and sustainable livelihoods and indicators of sustainable development.
Measuring Sustainability:

- Context, Techniques and indices

National policies and strategies for sustainable development;

Suggested Reading

1. Coates J. (2004). Ecology & Social Work: Towards a New Paradigm. New York: Paul & Company Public Consortium
2. Gadgil, M. & Guha, R. (1995). Ecology & Equity: The Use and Abuse of Nature in Contemporary India. London: Routledge
3. Mahajan, V., Datta, S. & Thakur, G. (2001). A Resource Book for Livelihood Promotion. Hyderabad: BASIX
4. Phansalkar. (2003). Livelihoods: Promoting Livelihood Enhancement. Mumbai: Sir Dorabji Tata Trust
5. Hussein, K. & Nelson, J. Sustainable Livelihoods and Livelihood Diversification. IDS Working Paper 69. Sussex: Institute of Development Studies
6. Kulkarni, P.D. (2000). Social Issues and Development. New Delhi: Uppal Publishing House
7. Singh S. (1991). Social Development in India. New Delhi: Radha Publishers
8. Kumar, H. (1997). Social Work, Social Development and Sustainable Development. New Delhi: Regency Publications
9. Gore, M.S. (2001). Social Aspects of Development. Delhi: Rawat Publication
10. Gangrade, K.D. (2001). Working With Communities at Grass roots Level. New Delhi: Radha Publications

MSW 303 (B)

Family Dynamics and Welfare

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand family dynamics and various social work intervention strategies for family welfare.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the nature, functions, roles and changing pattern of the family system

CO2: To advance the understanding and knowledge on developmental tasks and family dynamics

CO3: To understand the theories and methods of social work practice

CO4: To develop a broad understanding of the various family welfare services and Social work Interventions

CO5: To use appropriate interventions in family settings

Course Content:

Unit I Introduction to Family

Defining Families:

- Characteristics
- Family Rituals
- Family Traditions
- Family Routines

Family Dynamics and Functions, Conflicts and Violence

Diversity of families: Nuclear family, Joint family, Extended family, Single parents, Younger parents and Foster families.

Unit II Theories

Family Systems Theory

Structural Theories

Social Exchange Theories

Family Development Theory

Unit III Social Institution and Family

Definition, Types of Marriage, Working parents, Division of labor in Families

Feminist and Gender Perspective of Families, Impact of Urbanization / Modernization on marriage stability and Parenting

Parent Child Relationship, Family Stress and Sibling Rivalry

Institutions for family Welfare:

- Ministry of Health and Family Welfare
- National Institute of Health and Family Welfare
- National Rural Health Mission

- Planning Commission
- Family Courts
- Legal Service Authority
- INGOS' and NGOS' role in empowering families.

Unit IV Social Work interventions

Social Work interventions for Families:

- Families living in Poverty
- Families of prisoners
- Families with persons living with disability
- Migrant families
- Families of victims of Domestic violence and Transgender families,

Therapies

- Structural family therapy
- Milan systems therapy
- Solution Focused Therapy
- Narrative therapy

Methods of Social Work interventions:

- Genogram of the family
- the Flow Chart
- Eco Map
- Pathways plans
- Diary Sheet
- Home Visits.

Suggested Reading

1. Chakrabarthi K. K. (1994). The Indian Family. (ed). New Delhi: Manav Sangrahalaya
2. Desai, Murli. (1994). Family and intervention: A course compendium. Mumbai: TISS
3. De-Souza, A. (1978). Children in India, Critical issues in Human Development. New Delhi
4. Goel, M. (1997). Marital disputes and Counseling Methodology, Vol.1. New Delhi: APH Publishing Corporation
5. Khan, M.Z. (1991). Trends in Family Welfare Planning. New Delhi: International Publishers
6. Tiwari, S. (2000). Health and Family Welfare. Delhi: Anmol Publications Pvt. Ltd
7. Hartmen, A. & Laird, J. (1985). Family centered Social Work Practice. London Free Press
8. Patel, T. (2005). The Family in India: Structure and Practice. Delhi: Sage Publications
9. Mathur, Hari Mohan. (1992). The family welfare programmes in India. (ed). New Delhi:

10. McCurdy Karen & Jones, Elizabeth. (2000). Supporting Families: Lessons from the Field.
USA: Sage Publications

MSW 303 (C) Human Resource Management and Occupational Social Work

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the overall environment and its impact on the nature, structure and development of organizations in corporate, public and voluntary sectors in the context of social work profession.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the concept of human resource management and occupational social work CO2:
To gain knowledge on social work orientation on corporate culture, particularly as it relates to social issues in the workplace

CO3: To acquire the skills of comprehending a multi-stakeholder perspective in viewing workplace issues

CO4: To formulate Social Work intervention strategies in HRM

CO5: To understand policies and procedures involved in establishing and maintaining human service organizations

Course Contents:

Unit I Human Resource (HR) Approach in Management

Value of work, Management

- Meaning
- Definition
- Nature and Principles of management – Henry Fayol, Principles of Scientific Management, F. W. Taylor, Management vs. Administration,

Human Resource approach, System approach in the workplace.

Unit II Human Resource Management (HRM) and Corporate Ethics

Human Resource Management (HRM), Human Resource Development (HRD) and Personnel Management (PM)

- Meaning
- Definition
- Scope
- Differences
- Strategic Human Resource Management (SHRM)
- Difference between HRM and SHRM

- Business strategy
- Organizational capability
- Corporate ethics
- Corporate Strategy
- Recent trends in HR and Competencies of HR professional in Business Organizations

Unit III Human Resource (HR) Planning and Industrial Relations (IR):

Planning of HR and POSDCORB.

Industrial relations

- Changing nature of the Indian workplace
- Needs and problems of employees and special groups in the workplace
- Workplace conflict
- Gender sensitivity
- Disability management
- Diversity management
- Spirituality in the workplace.

Unit IV Occupational Social Work and/ in HRM

Occupational Social Work:

- Meaning, scope and nature
- Employee Assistance Programmes- Training and Development, models, services, current trends and scope in India
- Role of social workers in Industrial Settings.

Suggested Reading

1. Nalini, R. (2011). Social work and the workplace. New Delhi: Concept Publications
2. Rao, Subba. (2000). Personal & Human Resource Management. Himalaya Publishing House, New Delhi
3. Aswathappa, K. (2001). Human Resource & Personal Management (Text & Cases). Tata McGraw Hill Publishing Company Limited, New Delhi
4. Mamoria C.B. & Gankar S.V. (2002). Personal Management (Text & Cases). Himalaya Publishing House, New Delhi
5. Mor Barak, E. M., & Bargal, D. (Eds.). (2000). Social services in the work Place: Repositioning occupational social work in the new millennium. New York: The Haworth Press, Inc
6. Rao T.V. & Pereira D.F., Recent Experience in Human Resource Development, Oxford & IBM Publishing Co, New Delhi.
7. Sheikh A.M. (2003). Human Resource Development & Management, S. Chand & Company, New Delhi.

MSW 304(A)

Rural Community Development

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to develop an all-inclusive understanding of socio economic condition of rural community.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the socio economic condition of rural community CO2:

To understand the approaches to rural development

CO3: To develop skills in working with rural communities and development agencies CO4: To identify Social work Intervention strategies in rural community development

CO5: To develop the knowledge and practice of distributive justice and equalization of opportunities in the rural community

Course Contents:

Unit I Rural Community

Community:

- Meaning
- Types
- Characteristics
- Dynamics,

Rural Community:

- Meaning
- Characteristics
- Types of Villages
- Scope of studying the rural community and its relation to social work:

Problems of Rural community

- Poverty
- Illiteracy
- Financial exclusions
- Unemployment
- Problems related to agriculture, health, energy and water.

Unit-II Rural Community Development

Community Development:

- Concepts
- Definition
- Objectives and Principles

Origin and development:

- Rural Community Development in India with reference to five years plan policy

Early Experiments:

- Sriniketan
- Marthandom
- Gurgaon
- Pilot projects: Etawah project, Nilokheri experiment, Firka scheme

Unit-III Theories and Approaches of Rural Development

Theories of Community Development:

- Micro-Macro community development theory,
System theory, Modernization Theory, Dependency theory

Rural development approach:

- Spatial Planning approach
- Multipurpose approach
- Integrated development approach
- Area development approach
- Multilevel district planning approach
- Target group approach

Gandhian Model of Rural Development;

Unit-IV local self-governance and services and schemes for rural development

Panchayati Raj Institution:

- Background
- 73rd Constitutional amendment Act
- Structure, Feature and Function of PRI,

Role and function of Council for Advancement of Peoples Action and Rural Technology(CAPART),
National Institute for Rural Development (NIRD), National Bank for Agriculture and Rural
Development (NABARD) Regional Rural Bank (RRB), Rural Co- operatives and SHGs, Recent
Rural Development Schemes and Projects

Role of community development worker

- Application of social work methods in rural development
- Role of NGOs

Suggested Reading:

1. Robinson, J. W. & Green G. P. Introduction to Community Development: Theory, Practice, and Service-Learning. SAGE Publications
2. Jain, S. C. (1967). Community development and panchayati raj in India. Allied Publishers.

3. Siddiqui, H.Y. (1997). Working with Communities: A Introduction to Community Work. New Delhi, Hira Publications
4. Mukerji, B. (1961). Community Development in India. Orient Longmans
5. Singh, K. (2009). Rural Development: Principles, Policies and Management. SAGE Publications
6. Jain, S.C. (2005). Rural Development. Concept Publishers
7. Singh, K. (1986). Rural Development, Principles, Policies and Management. New Delhi, Sage Publication.
8. Venkata, R. K. (1998). Rural Development in India- Poverty & Development. Himalaya Publishing House.
9. Palanithurai, G. (2002). Dynamics of New Panchayati Raj System in India: Panchayati raj and multi-level planning. Concept Publishing Company
10. Sharma, R. (2005). Grass-Root Governance: Changes And Challenges In Rural India. Rawat Publications, Jaipur

MSW 303 (B) Child and Childhood in India: Theories, Perspectives and Issues

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the theories, perspectives and issues of childhood in India.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the psychological definitions of child and childhood.

CO2: To understand the different factors that influence development and behavior of children CO3:

To understand the different issues children face in society

CO4: To understand the different approaches to child rights

CO5: To develop an ability to critically analyze the programmes and policies for children

Course Content:

UNIT I Introduction to Child and Childhood

Understanding child and childhood

- childhood development
- Scope of child development
- Meaning and Importance of different stages of growth and Development .

Heredity and Environment

- Salient features of different stages in life
- Factors influencing Growth and

Development - principles of child development.

UNIT II Theories on Child development

Language Theories

Emotional Theories

Learning Theories

Psycho-Social Theories

Personality Theories

Moral Theories

UNIT III Working with children with from rights based perspectives

Issues of children

- Social
- Cultural
- Economic and political with reference to UNCRC guidelines

Developmental Issues

- Education
- Play
- Social and cultural

Survival Issues

- Human rights
- Female feticide
- Infant mortality
- Nutritional rights
- Immunization rights
- Crime against children etc.

Protection Issues

- Child marriage
- child trafficking
- gender discrimination
- children in armed conflict
- child labour
- child prostitution etc

Participation Issues

- Children's parliament
- Balpanchayats
- childrens' forums/associations etc.

UNIT IV Child Rights Policy and Programmes

Constitutional rights

- brief overview of child rights

National and state child policies in India

- National Policies for Children
- National Action Plan for Children
- Commissions for Protection of Child Rights
- Juvenile Justice(care and protection) of child rights Act, 2000, 2015
- Adoption and Maintenance Act, Central Adoption and Regulatory Agency (CARA guidelines).

UN Conventions and declarations

Government and non-government services

- Rajiv Gandhi National Creche Scheme for children of working mothers, anganwadis/balwadis, day-care centres, crèches etc

Suggested Reading

1. Bajpai, A. (2005). Child Rights in India: Policy and Practice. USA: Oxford University Press
2. Hurlock, E. B. (1968). Child development. New Delhi: Tata McGraw Hill
3. Cohen, L.G. & Spencier, L.J. (2003). Assessment of children and youth with special needs. Boston: alley and Bacon
4. Venkatesan, S. (2005). Children with developmental disabilities: a training guide for parents, teenagers and caregivers. New Delhi: Sage
5. Pachaury, D.K. (1999). Children and Human Rights. New Delhi: A.B.H. Publishing Corporation
6. Chaturedi, T.N. (1979). Administration for Child Welfare. New Delhi: Indian Institute of Pub
7. Asch, M. (2000). Principles of Guidance and Counselling. New Delhi: Sarup & Sons
8. Maluccio, A.N., Pine, B.A. & Tracy. E.M. (2002). Social Work Practice with Families and Children. New York: Columbia University Press
9. Enakshi, G.T. (2002). Children in Globalizing India- Challenging out Conscience (ed). New Delhi: HAQ Centre for Child Right
10. Berk, L.E. (1999). Child Development (Third Ed). New Delohi: Prentice Hall of India

Objective: This course enables students to understand about developments of labour legislation and its importance.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To become a professional practitioner of communication development tools

CO2: To advance the understanding of the laws relating to Industrial Relations, Social Security, Employment exchange and trainees

CO3: To understand grievance and the procedures of handing grievances

CO4: To understand laws relating to protection, regulation and welfare of labours CO5:

To understand the development and the judicial setup of Labour law

Course Contents:

Unit I Introduction

Importance of Labour Legislations in India and its Objectives.

Principles of Labour Legislations ,Labour in Indian Constitution.

Laws relating to working conditions

- Factories Act 1948
- Shops & Establishment Act
- Contract Labor (Abolition & Regulation) Act 1970
- The Plantations Act 1951
- The Indian Mines Act 1952.

Unit II Protective Provision for Workers

Wages ,Bonus and Social Security

Laws relating to Wages

- The Minimum Wages Act 1948
- The Payment of Wages Act 1936
- Equal Remuneration Act 1976
- Payment of Bonus Act 1965.

Laws relating to Social Security

- Employees Provident Fund Act 1952
- Employees State Insurance Act 1948
- Workmen's Compensation Act 1923
- Payment of Gratuity Act 1972

Maternity Benefit Act 1961.

Unit III Labour Welfare and related laws

Importance of Labour Welfare, Scope of Labour Welfare Activities, Theories of Labour Welfare and Importance of Labour Welfare in India.

Laws relating to employment, service conditions, Employee Relations

- The Industrial Disputes Act 1947
- Trade Unions Act 1926
- Industrial Employment (Standing Orders) Act 1946.

Unit IV Grievance and Discipline handling

Grievances & Discipline

Grievance- Causes / sources of Grievances- Grievance procedure- A model Grievance

Procedure- Grievance redressal machineries- Gender sensitivity - Sexual Harassment at Work places- preventive steps-procedures in dealing with the Complaints

Suggested Reading

1. Garg, K.C. Sharma, Mukesh; Sareen, V.K. (2002). Commercial And Labour Laws, Kalyani publishers, Ludhiana
2. Mathur .A.S. (1968). Labour Policy and Industrial Relations in India. Ram Prasad, Agra
3. Babu, Sharath and Rashmi, Shetty. (2007). Social Justice and Labour Jurisprudence. SAGE Publication. New Delhi.
4. Yadav, L.B.(ed.). (2000). Reading in Social and Labour Welfare. Institute For Sustainable Development, Lucknow
5. Akbas, S. (1983). Industrial Social Work: Influencing the System at the Workplace. Dinerman, M.(Ed.) Social Work in a Turbulent World, Silver Spring, MD: NASW
6. Straussner, S.L.A. (1990). Occupational Social Work Today. New York: The Haworth Press
7. Saini, D.S. & Khan, S.S. (2000). Human Resource Management Perfective for the New Era. New Delhi: Response Books.
8. Mor Barak, M.E. & Bargal, D. (ed.) (2000). Social Services in the Workplace: Repositioning Occupational Social Work in the New Millennium. New York: The Haworth Press Inc.
9. Papola, T. S. & Sharma, A. N. (1999). Gender and Employment in India. New Delhi, Vikas Publishing House
10. Malik, P.L. (2000). Industrial Law Vol. I & II. Lucknow: Eastern Book Company

MSW 305 Dissertation**Marks: 30 + 70=100
Total Credits: 4**

Objective: This course enables students to develop deeper knowledge, understanding, capabilities and attitudes in the various field of social work practice.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the basic concept of Social Work Research

CO2: To have an in-depth understanding on research methods

CO3: To identify the issues that must be addressed

CO4: To develop written and oral presentation skills CO5:

To develop a research proposal

Contents:

- Research Proposal Writing.
- Presenting the Research proposal.

MSW 306 Field Work Practicum**Marks: 70 + 30=100
Total Credits: 4**

Objective: This course provide students the opportunity to work in a professional setting to develop and demonstrate skills in social work, to integrate the theories and practices learned in and out of the classroom, to develop a sense of commitment to the social work profession and Code of Ethics, to develop an understanding of the diversity of a community population and the role of diversity in social work practice, to develop an understanding of how administrative processes and policies impact delivery of services, to develop professional relationships within the community to better understand local resources to benefit future clients, and to confirm personal interests and abilities in the social service field.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To enhance skills for practice in specific situations, specific problems and issues

CO2: To have a broad understanding on the organisational behaviour and functioning in administrative as well as in the field

CO3: To identify issues of the society and develop self awareness and skills in the learning process

CO4: To understand the role of agency in addressing current social realities CO5:

To gain knowledge and skills for working in corporate sectors

Contents:

- Concurrent Field Work 20 to 25 days in any set up

- Study tour for 7 to 10 days

MSW 307(MDC) Management of Non- Governmental Organization

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the concept and management of Non Governmental sector.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To draw an understanding of NGO Sector

CO2: To develop basic legal and managerial skills for NGO management CO3: To understand the concept of project management

CO4: To be able to develop a project proposal CO5:

To understand the concept of CSR

Course Content

Unit I Basic Concept

Introduction to Non- Government Organization

- History of NGOs in the West and India

Types and Activities of NGOs

- Self Benefiting
- Service Oriented
- Advocacy
- Others
- Networking etc.)

Social Audit:

- Importance and its applicability for PRI.

Unit II Procedures for Establishment of an NGO

Emerging trends in NGO sector.

Societies Registration Act 1860,

- Memorandum of Association and Bye-Laws
- Tax relief under various Acts
- The Foreign Contribution (Regulation) Act, 1976 (FCRA)

Formation of Trust and Society, Differences between the Trust and Society

Legal Procedures for establishment of an NGO

Unit III Social Entrepreneurship, Fund Raising and CSR

Social Entrepreneurship

- Concept, Sustainability of Social Enterprise

Difference Between For Profit Entrepreneurs and Not For Profit Entrepreneurs

Funding Raising

Introduction to Corporate Social Responsibility, Importance of CSR, Key Issues in CSR

Role of NGO's & civil societies in CSR.

Unit IV Human Resources Management (HRM) and Organisational Behaviour (OB) in NGO's

HRM, Concepts ,Objectives, Policies and Scope

Job Design and analysis

Job Evaluation

OB and Organisational Culture & Climate.

Concept of Leadership

Motivation and Work Performance

Suggested Reading

1. Allison, M. & Kaye, J. (2005). Strategic planning for Non-profit Organisations: A Practical guide and workbook. John Wiley & Sons.
2. Kotler, Philip, Roberto, Ned & Lee, Nancy. (2002). Social Marketing: Improving the Quality of Life. California: Sage Publications, pp. 111- 156
3. Chiang Pei-heng. (1981). Non-Governmental Organizations at the United Nations. Identity, Role and Function. New York: Praeger
4. Dadarwala, N.H. (2005). Good Governance and Effective Boards for Voluntary/Non- profit Organisations. New Delhi: CAP
5. PRIA . (2000). Defining Voluntary Sector in India: Voluntary Civil or Non-profit, New Delhi: PRIA
6. PRIA . (2001). Historical Background of Non-profit Sector in India. New Delhi: PRIA
7. Bryson, J.M. (2004). Strategic Planning for Public and Nonprofit Organizations: A Guide to Strengthening and Sustaining Organizational Achievement. Jossey-Bass

social worker in working with the challenged.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the conceptual differences between the terms 'impairment', 'disability', 'handicap' and 'challenged' and understand the concept of classification and labeling

CO2: To analyze the factors that influence prevalence of disabilities

CO3: To develop knowledge about the various disabling conditions associated with the challenged.

CO4: To understand the social work intervention mechanisms for the challenged CO5:

To formulate intervention strategies while working with the challenged

Course Content

Unit I Concept, Classification and Characteristics of the challenged

Impairment, Disability and Handicap:

- Concept and Definition.

Classification of disabilities/ challenged.

Prevalence of disabilities/challenged in India and North East India.

Characteristics and behavioural manifestations of children with various disabilities/ challenged

Unit II: Development in the Education of the Challenged

Historical perspectives and Constitutional obligations regarding the disabled/ challenged.

Recommendations/Suggestions of the National Policy on Education (1986) and Programme of Action (1992) for the disabled/challenged.

Centrally sponsored scheme of Integrated Education for the Disabled (IED)/ challenged and the Role of State level agencies –DPEP Projects.

National Institutes and Schools for Children with severe handicaps/ challenged.

Unit III: Identification and Assessment of the challenged and Other Behavioural Activities

Identification and assessment of functional disabilities and differential diagnosis.

Educational Implications of the challenged and Programme Planning.

Adaptations in Curricular and Co-curricular programme activities and transaction.

Adaptations in Behavioral Activities

Unit IV: Role of Various Agencies and social work intervention

Role of Non-Government, National and International agencies in the education of the challenged

Role of parents and community in rehabilitation of the challenged children

Role of special schools and inclusive schools in the education of the challenged

Social work intervention strategies for the different categories of the challenged

Suggested Reading

1. Hallahan, D.P & Kauffman, J.M. (1991) Exceptional children: Introduction to special education, Allyn & Bacon, Boston.
2. Smith, D.D & Luckasson, R (1992) Introduction to Special Education: Teaching in an age of challenges, Allyn & Bacon, Boston.
3. Berdine, W.H & Blackhurst, A.E.(1985) An Introduction to Special Education. Little Brown & Company, Boston.
4. Kundu C.L. (Ed.) (2000), Status of Disability in India 2000, New Delhi.
5. Richard A Culatta, James R. Tompkins, Culatta, R.A, Tompkins James R.(1999) Fundamentals of Special Education, What Every Teacher Needs To Know, Merrill Prentice.Hall Inc.NJ 07458
6. William I Gardner (1997), Gardner, William I Learning and Behavioural Characteristics of Exceptional Children and Youth. Allyn and Bacon-M-02210.
7. Batshaw, M.L. and Parret, Y.M.m (1986) Children with handicaps. A medical primer. London: Paul Brookes.
8. NIMH (1988). Mental Retardation – A manual for multi rehabilitation workers.
9. Clarke, A.N. Clarke, A.D.B. & Berg, J.M. (1985) Mental deficiency. The changing outlook (4th Edition) London: Methuen Co.
10. Batra, Sushma. Social Integration of the Blind: New Delhi, Concept Publishing Company, 1981.
11. Bhat, Usha, Physically Handicapped in India-Growing National Problem. Bombay: Popula Book Depot, 1963

MSW 402 Community Health and Social Work Practice**Marks: 30 + 70=100
Total Credits: 4**

Objective: This course enables students to understanding health and its dimensions and the scope of social work in health care settings.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the concept of health and its importance

CO2: To develop an understanding on health care, public health and community CO3:

To understand the importance of health in the development context

CO4: To understand the concept of health system, programmes and policies in India

CO5: To know the various Intervention strategies in delivering care towards the community

Course Contents:

UNIT I: Introduction to Health and Health Education

Concepts and Definitions on Health, Dimensions on Health:

- Physical, Mental, Spiritual, Emotional, Vocational and Others

Determinants and Indicators of Health

Alma Ata Declaration, Millennium, Sustainable Development Goals, Health as Human Right

Health and gender

UNIT II: An Introduction to Disease and Social Medicine

Concept of Disease

Communicable and Non Communicable Disease, Common Disease In India

Population Medicine, Public Health, Preventive Medicine, Social Medicine

Alternative system of health:

- Yoga
- Homeopathy
- Unani
- Aryurvedu
- Siddha
- Naturopathy

UNIT III: Health System, Programmes and Policies

Health care system in India

National health policy, Reproductive Child Health, Notational Rural Health Mission

HIV/AIDS In India and Northeast India

UNIT IV: Intervention Strategies & Role of Social Work In The Field Of Health

Health communication:

- Information
- Education
- Motivation
- Persuasion
- Counselling
- Raising Morals
- Health Development

Social work intervention in medical and psychiatric settings

Role of social worker in health care delivery system:

- Psychosocial Assessment
- Family Education & Crisis Intervention
- Counselling For Individuals
- Couples & Families
- Information & Referral Services

Suggested reading

1. Park, K. (2009). Preventive and Social Medicine. Banarsidas Bhanot Publishers, Jabalpur
2. Allot, M. (1998). Understanding Health and Social Care. Sage, New Delhi
3. Atkinson, P. (1995). Medical Talk and Medical Work. Sage, New Delhi
4. Barker, C. (1996). The Health Care Policy Process, Sage, New Delhi
5. Bracht, N. (2009). Health Promotion at the Community Level, Sage, New Delhi
6. Mahajan, B.K. (2010). Text Book of Social and Preventive Medicine, Jaypee Brothers Medical Publishers
7. Drinka, T.J.K. & Clark, P.G. (2000). Health Care Teamwork: Interdisciplinary Practice and Teaching. Westport, CT: Auburn House
8. Jerrold, R.Brandell, (2010). Theory & Practice in Clinical Social Work. Sage Publication, New Delhi
9. Dasgupta, M. & Lincoln, C.C. (1996). Health, Poverty and Development in India. Oxford University Press, New Delhi
10. McLeod, E., & Bywaters, P. (2000). Social Work, Health and Equality. Routledge. London

MSW 403(A)
30 + 70=100

Tribal Community Development and tribal right

Marks:

Total Credits: 4

Objective: This course enables students to understand the social science perspective available for the study of tribal communities.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To acquire an understanding of the social science perspective available for the study of Tribal Community

CO2: To develop respect and recognition for tribal as equal contributors in development

CO3: To acquire knowledge about tribal problems

CO4: To develop understanding of governmental initiatives towards upliftment of tribal's in India

CO5: To acquire knowledge on various approaches to tribal community development

Course Contents

Unit I Basic Concept

Tribal society:

- Concepts
- Definition
- Characteristics
- Kinship and descent

Social structure

- Marriage
- Family
- Community

Classification of Tribes in India

Tribal Society in North East India

Unit II Problem of Tribal Community

Distribution of tribal population in India

Major and indigenous tribes in India

Tribal Problems:

- Land Alienation
- Indebtedness
- Poverty
- Migration,
- Isolation

Approaches to solve tribal problems:

- Assimilation
- Integration
- changing land reform in tribal areas

Unit III Movements

Tribal Movements in India:

- Agrarian Movements
- Santhals movement
- TanaBhagat movement
- Brisadal movement
- Naxalbari movement-1967
- Bodo and Naga movement,

Tribal reform:

- Social

- Economic

- Political

Social change in tribal India, Modern factors of tribal transformation

Tribal upliftment measures

- Protective

- Mobilization

- Developmental

Unit IV Programmes and Services

Government Policies and programmes since Independence and their Impact on Tribal Societies,

Constitutional Provisions:

- Indian Constitution: V & VI Schedule

- Protective legislations

- New strategy for Tribal development

- Tribal sub-plan

Programs of NGO's and their Impact on Tribal Societies.

Social work intervention: scope and role of social worker

Suggested reading

1. Bhattacharjee, J.B. (1998). Sequences of development in North-East India. Delhi: B.R. Publications
2. Moonis, R. & Ahmad, A. (1990). An atlas of Tribal India. New Delhi: Concept Publishing
3. Ghurye, G.S. (1963). The Scheduled Tribes. Bombay: Popular Prakashan Pvt. Ltd
4. Chaudhuri, B.(ed). (1982). Tribal development in India: Problems and Prospects. New Delhi: Inter-India Publications
5. Ahuja, A.K. (2009). Welfare and Tribal Development and Administration. New Delhi: Rawat Publications
6. Burman, B.K. (1994). Tribes in Perspective. New. Delhi: Rawat Publications
7. Mahanti, N. (1994). Tribal Issues: A non-conventional Approach. New Delhi: Inter-India Publications
8. Haimendorf, C. (1994). Tribes in India. New Delhi: Oxford University Press
9. Sharma, K.L. (2001). Reconceptualising Caste, Class and Tribe. New Delhi: Rawat Publications

10. Patnaik, S.M. (2011). Culture, Identity & Development. New Delhi: Rawat Publications

MSW 403(B) Women Centric Social Work Practice

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the scope of women centric in social work practice.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To develop a critical understanding of 'Women' as a vulnerable group

CO2: To develop an understanding of social systems that affects women's position CO3:

To understand the struggle to restore women's position in the society

CO4: To develop skills and understanding of social work intervention pertinent to Women's welfare and development

CO5: To understand feminism and its relevance in contemporary era

Course Content:

Unit- I Introduction

Patriarchy and Women: Patriarchy in India and Northeast India

Feminism:

- Liberal
- Marxist
- Radical and Socialist Feminism
- Relevance of feminism
- Feminism and Social Work Practice

Present status of women in India

- Education
- Health/Reproductive health
- Employment
- Violence against Women
- Political Participation

Unit- II Women's Movement and the state

Women's Movement in India

- CEDOW
- Nationalist Movement
- Towards Equality Report

Theories of Development

National and International programme and policies for women

- Role of the Department of Women and Child Development\

- National Commissions and Committees on Women

Unit- III Social and Political Participation

History of Voluntary Organization in India

- All India Women's Conference
- Young Women Christian Associations
- Indian Association for Women's Studies
- National Federation for Women

Role of Voluntary Organizations and Empowerment of Women

Panchayati Raj and Women's Political Participation in India

Unit –IV Laws and Social Work Intervention

Personal Laws and Labour Laws related to women, Legal Protection for Women:

- Family Court, Police and Judiciary

Anti-Rape Law, Dowry Prohibition Act, Sexual Harassment in the work place, Indecent

Representation of Women (Prohibition) Act 1986

Feminist Social Work, Social Work intervention and mechanisms

Suggested reading

1. Ahuja, (1998). Women's organization and Social Network. Guwahati: Eastern Book House
2. Ahuja, (1997). Violence against Women. Guwahati: Eastern Book House
3. Cook, Rebecca. (1994). Human Rights of Women: National and International Perspectives. Philadelphia, University of Pennsylvania Press
4. NIPCCD. (1988). Handbook of Policy and related document on women in India. New Delhi, NIPCCD
5. Verma, R. (1997). Family courts in India: An appraisal of strengths and limitation. New Delhi: Inter Indian Publications
6. Raj, K. et al. (1999). Encyclopedia of status and Empowerment of Women in India. New Delhi: Veena Publication
7. Karmakar, K.G. (1999). Rural credit and self-help groups: Microfinance needs and concepts in India. New Delhi Sage Publication
8. Joshi, P. (1988). Gandhi on women. Ahmedabad: Navjeevan Publishing House
9. Walby, S. (1990). Theorizing Patriarchy. Cambridge, Basil Blackwell Ltd
10. ICCSSR. (1975). Status of women in India: Synopsis of the Report of National Committee on the status of women. New Delhi: Allied Publication

MSW 403(C) Organizational Behaviour

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand about organizational behaviour, its

objective and importance.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand the knowledge and skills in dealing with human behaviours in the workplace

CO2: To develop an understanding of Organizational Behaviour

CO3: To develop appropriate skills and competencies in managing human resources

CO4: To understand the Processes and concerns of Employee Development

CO5: To develop the understanding of workforce diversity, Personality differences and to manage diversity

Course Contents:

Unit-I Introduction

Organization Behaviour :

- Definition
- Scope and Approaches
- Organizational Components
- Classical and modern approaches to Management
- Human Relations movement and Behavioral systems approach to OB

Unit-II Dimensions of Organisational Behaviour

Personality predispositions and managerial effectiveness:

Reinforcement and motivation

- Meaning of Motivation
- Objective of Motivation
- Traditional Theories of work Motivation
- McGregor's Theory
- Two Factor Hygiene Maintenance Theory and Herzberg-Vroom's Expectancy.

Leadership

- Definition and characteristics
- Classification of leadership
- Qualities of a leader
- Leadership styles and Theories of Leadership

Unit-III Organisational Change and Culture

31. Organizational change:

- Forces of change
- Resistance to change and Managing planned change

- Approaches to organizational change and Innovation
- Managing the innovation process and Creating a culture for innovation.

Organizational Culture

- Nature of culture
- Cultural dimensions (Mechanistic & organic, Authoritarian, participative, sub-culture, dominant culture, strong & weak culture) - Key cultures : Power culture, people/person culture. Task culture, role culture

Unit-IV Organisational Development

Organizational Development:

- Definition
- Scope and Characteristics
- Diagnostic phase: Techniques used in the diagnostic process
- OD interventions-Team Building
- Survey feedback and Grid Training.

Suggested reading

1. Blump M.I. & Naylor I. C. (1968). Industrial Psychology -Theoretical & Social Foundation. Harper Row Publishers, New York.
2. Chatterji N. R. (1969). Industrial Psychology. Sudha Publication, New Delhi
3. Gangadhara Rao, M., and Rao, VSP, and Narayana, P.S. (1987). Organizational Behaviour. Konark Publishing Pvt. Ltd., New Delhi
4. Gosh & Ghorpadhe, (1985). Industrial Psychology, Himalaya Publishing House, Bombay
5. Hersey, Paul and Kenneth Blanchard, (1988). Management of Organizational Behavior: Utilizing Human Resources. Prentice-Hall, Englewood Cliffs, New Jersey
6. Luthans, Fred, (1990). Organizational Behaviour. Tata McGraw Hill, New York.
7. Maslow, Abraham, (1943). Motivation & Personality. Harper & Row Publication, New York
8. Robbins, Stephen P. et al (2001). Organizational Behaviour. Prentice-Hall, New Jersey
9. McCormick, Ernest J., and Joseph Tiffin, (1974). Industrial Psychology. Prentice-Hall, Inc., Englewood Cliffs, New Jersey
10. Maslow, Abraham, (1943). A Theory of Human Motivation. Harper & Row Publication, New York

MSW 404 (A) Urban Community Development

Marks: 30 + 70=100
Total Credits: 4

Objective: This course enables students to develop an in-depth understanding of governmental initiatives towards upliftment of the urban areas in India.

Course Outcomes: The Successful completion of this course shall enable the student.

CO1: To acquire an understanding of the social science perspective available for the study urban communities

CO2: To develop analytical skills in assessing problems associated with communities and understanding the steps in problem solving

CO3: To acquire knowledge and impact of various approaches to Urban community development

CO4: To understand Social work Intervention strategies in urban community development

CO5: To develop analytical skills in assessing problems associated with communities and understanding the steps in problem solving

Course Contents:

Unit-I Basic concepts

Urban Community:

- Meaning
- Characteristics
- classification of urban area,

Urbanization

- Meaning
- Factors
- Emerging trends

Urban Social Problems:

- Drug addiction
- Sex workers
- Juvenile Delinquency
- Urban Poverty
- Urban Employment
- Urban Settlement & Housing
- Urban pollution
- pavement dwelling and street vendors
- waste management and transport

Unit-II Society in Urban Area

Urban Social System:

- Changing pattern of family
- Marriage
- Social Stratification and other forces of social change

Occupation pattern of urban area and Urban informal Sector

Rural urban migration:

- causes and Consequences

Urban Slums:

- Origin and development of slum
- Issues: Socio-Psychological Issues of Slum Dwellers
- Effect of Industrialization and Globalization on Slum
- clearance board: Functions & Administration structure

Unit-III Urban Community Development and Administration

Urban Community Development

- Definition, Objectives and Historical Development,

Principles, Approaches, methods and indicators of urban community development

Welfare extension projects of Central Social Welfare Board; Urban development planning:

Town and Country Planning Act 1971

Urban Local Self Governance:

- 74th Constitutional Amendment Act, Structure and functions
- Challenges, People's participation in urban development

Unit-IV Programme and Services

United Nation's Centre for Human Settlement (UNCHS), Urban Basic Services Programmes (UBSP); Housing and Urban Development Corporation (HUDCO) and JNNURM, National Urban Livelihood Mission (NULM) and NitiAyog

Problems in implementation of Urban Community Development Programmes.

Role of Community Development Worker, Role of NGOs, Application of Social Work method in Urban Development

Suggested reading

1. Sihng K. & Steinberz F (eds.). (1996). Urban India in Crisis, New Age Publishers, New Delhi
2. Ronnan, Paddison. (2001). Handbook of Urban Studies. Sage India
3. Mohanty, B. (1993). Urbanization in Developing Countries. Concept Publishing Company, New Delhi
4. Asthana M. and Ali, Sabir. (2003). Urban Poverty in India, Mittal Publication, New Delhi
5. Sandhu, R.S (ed.) (2003). Urbanization in India: Sociological Contribution. New Delhi: Sage Publications.
6. Nagpal, H. (1994). Modernization and Urbanization in India. Jaipur: Rawat Publications
7. Safa, I.H. (1982). Towards a Political Economy of Urbanization in Third world Countries.

Delhi: Oxford University Press

8. Padaki, V.& Vaz, M. (2003). Institutional Development in Social Interventions. New Delhi: Sage Publications.
9. Gupta, K.R. (2004). Urban Development Debates in the New Millennium Vol.I and Vol. II. New Delhi : Atlantic Publishers and Distributors
10. Thakur, B. (ed.) (2005). Urban and Regional Development in India: Vol I. New Delhi: Concept Publishing Company.

MSW 404(B) Working with Families: Children, Youth and Aged

**Marks: 30 + 70=100
Total Credits: 4**

Objective: This course enables students to develop an in-depth understanding about children, youth and aged.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand issues pertaining to children, youth and aged in India and Northeast India.

CO2: To know the national and international rights of children, youth and aged.

CO3: To understand the different laws and various government programmes related to children, youth and aged.

CO4: To understand the different laws and programmes for the vulnerable groups.

CO5: To acquire skills for working with families

Course Content:

Unit I: Issues pertaining to Children, Welfare Policy, Programmes and Acts

Demographic profile of children in India and Northeast India

Issues pertaining to children

- Street child
- Destitute
- Abandoned
- Orphaned
- child labor
- child trafficking
- HIV/AIDS affected and infected children
- child beggar
- child prostitution
- special problems of girl child.

Government programs & services for children:

- National Policies for children, JJ Act 2016
- ICDS
- ICPS
- SSA

- Mid-Day meal
- Beti Bachao Beti Pado
- Kishori Shakti Yojana
- Girl Child Saving Scheme
- Udisa
- UJAWALA.

Unit II: Issues pertaining to Youth and Welfare Policy, Programmes and Acts

Demographic profile of youth in India and Northeast India

Issues pertaining to youth

- Substance abuse
- Identity crises
- Violence
- unemployment(shifting economy)
- single parent household
- teen pregnancy
- HIV/AIDS
- armed conflicts
- disability
- education
- Inter-generational relationships.

Government programmes & services for youth:

- National Youth Policy 2014
- National Programme for Youth and Adolescent Development (NPYAD)
- Nehru Yuva Kendra Sangathan (NYKS)
- Rajiv Gandhi National Institute of Youth Development (RGNIYD)
- Pradhan Mantri Kausal Vikas Yojana
- SAKSHAM
- SABLA.

Unit III: Issues to Aged and Welfare Policy, Programmes and Acts

Demographic profile of Aged and Welfare policy

- Programmes and Acts

Government programmes & services for aged

- Constitutional Provisions
- National Social Assistance Programme (NSAP)
- Indira Gandhi Old Age Pension Scheme (IGNOAPS),
- Maintenance and Welfare of Parents and Senior Citizens Act, 2007.

Unit IV: Social work intervention with children, youth and aged

Family-centered Social work

- family therapy
problem solving approach, and developmental approach, Counseling
- Concept, meaning, definition
- Types, and stages of counseling
- Theories on Counseling
- Skills of counseling

- Counseling settings– marriage/couple, HIV/AIDS, substance abuse, education/career, sexual abuse, children, aged, youth.

Suggested reading

1. Cohen, L.G. & Spencier, L.J. (2003). Assessment of children and youth with special needs. Boston: Allyn and Bacon
2. Hurlock, Elizabeth B. (1968). Child Development. New Delhi: Tata McGraw Hill Pub: Co; Ltd
3. Kumari, V. (2004). The Juvenile Justice System in India: From Welfare to Rights. Oxford University Press
4. Choudhury, Aparjita. Carson & Carson, (2006). Family life Education in India, Perspectives, Challenges and Applications. Rawat Publication: Jaipur
5. Chaturvedi, T. N. (1979). Administration for Child Welfare. New Delhi: Indian Institute of Pub
6. Bajpai Asha, (2005). Child Rights in India, Policy and Practice, Oxford University Press, US
7. Verma, R.S. (2000). Human rights: Burning issues of the world, Volumes I, II and III. Radiant Publishers, Delhi
8. Bhattacharya, S. (2008). Social Work Interventions and Management. Deep & Deep Publication, New Delhi
9. Venkatesan, S. (2005). Children with developmental disabilities: a training guide for parents, teachers and caregivers. New Delhi, Sage Publications
10. Desai, K.G. (1982). Ageing In India, Bombay, TISS Series 52.
11. Desai, M.M. and Khetani, M.D. (Editors. Morton, I.T. Seicher, Daniel Thursz and Joseph L.) (1979). Intervention Strategies for the Aged in India" In Reaching the Aged- Social Services in Forty-four countries. Vigiliante, Beverly Hills/London; Sage Publications,
12. Hancock, B. L. (1990). Social Work with Older People, New Jersey: Prentice-Hall.
13. Rose S R & Fatout M. (2003). Social Work Practice with Children and Adolescent, Boston: Allyn & Bacon

MSW 404 (C) Industrial Relations and Corporate Social Responsibility

Marks: 30 + 70 = 100

Total Credits: 4

Objective: This course enables students to understand the concept of human behavior at workplace and gain the knowledge for increasing self-effectiveness and tackling the behavior of group, individual and of organization.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To understand about Industrial relations

CO2: To understand the concept of Corporate Social Responsibilities CO3:

To know about the labour unions and welfare measures

CO4: To know about the social work intervention for IR and CSR activities

CO5: To develop entrepreneurial approach and skill sets to contribute for socio-economic development

Course Contents:

Unit-I Introduction

Definition

- concept, scope and Significance of industrial relations

Approaches to Industrial Relations

Industrial Relation System.

Unit-II Managing Grievance

Managing of Employee Grievance

Causes of Industrial Disputes, Forms of Disputes, Methods of Settlement of Industrial Disputes, Employee Discipline.

Unit-III Trade Union and Workers Participation in Management

Definition, concept, and objectives of trade unions.

Growth of Trade unionism in India

- major Trade Union movements in India

The Concept of Collective Bargaining, Negotiating Technique and Skills.

Workers participation in Management:

- Concept, objective, importance
- forms of participation
- limitations to workers participation

Unit-IV CSR Practice

Concept of Corporate Social Responsibilities

CSR in India

- Benefits of a CSR programme
- Clause 135 of Companies Act 2013,

CSR Planning and Strategies

CSR case studies.

Suggested reading

1. Memoria, C. B. (1999). Dynamic Of Industrial Relationship in India. Bombay: Himalaya.
2. Sharma, A. M. (1984). Industrial Relations Conceptual And Legal FrameWork .
Bombay: Himalaya
3. Srivathsava, V. (1998). Industrial relations and Labour Laws. New Delhi: Vikas

4. Gabbard, R. (1999). Essentials of Human Resource and Industrial Relations. New Delhi;

Himalaya

5. Subramainan, K. N. (1967). Labour Management Relations In Tamil Nadu. Madras: Book Agency.
6. Tripathi, P.C. (2005). Personnel Management and Industrial relations. New Delhi, Sulatanchand and Sons.

MSW 405 Dissertation

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to develop deeper knowledge, understanding, capabilities and attitudes in the various field of social work practice.

Course Outcomes: The Successful completion of this course shall enable the student: CO1:

To critically and systematically integrate knowledge

CO2: To have a deeper knowledge in the area of study

CO3: To understand and apply theoretical frameworks to the chosen area of study

CO4: To develop written and oral presentation skills

CO5: To analyze and present research findings

MSW 406 Field Work Practicum

Marks: 70 + 30=100

Total Credits: 4

Objective: This course provide students the opportunity to work in a professional setting to develop and demonstrate skills in social work, to integrate the theories and practices learned in and out of the classroom, to develop a sense of commitment to the social work profession and Code of Ethics, to develop an understanding of the diversity of a community population and the role of diversity in social work practice, to develop an understanding of how administrative processes and policies impact delivery of services, to develop professional relationships within the community to better understand local resources to benefit future clients, and to confirm personal interests and abilities in the social service field.

Course Outcomes: The Successful completion of this course shall enable the student:

CO1: To their perspective on welfare and developmental projects

CO2: To understand the agency as an organization, its structure, functions and sources of funding

CO3: To develop practice skills appropriate to problem solving process and apply them in direct service

CO4: To understand the overall service delivery system and its administration in the greater society

CO5: To gain knowledge and skills for working in corporate sectors

- Block Placement for 30-35 days in a particular organization

MSW 407 (MDC) Community Organizations and Community Development

Marks: 30 + 70=100

Total Credits: 4

Objective: This course enables students to understand the different approaches and various models for community organization and social action with a special reference to Indian situation.

Course Outcomes: The Successful completion of this course shall enable the students

CO1: To understand the concept of Community

CO2: To understand the basic component of community

CO3: To understand the Community Dynamics

CO4: To develop a strategy to work in the Community

CO5: To understand the concept, needs, principles, process and strategies of community work

Course Content:

Unit I Community Organization

Community and Formal Organization:

- Concept and Types

History: West and India

Community Organization Approaches and Models

Principles of Community Organization, Skills for Community Organizer

Community Organization and Community Development

Unit II Community Development

Concept of Rural Community and their programs & Policies

Concept of Urban Community and their programs & Policies

Concept of Tribal Community and their programs & Policies

Unit III Community Dynamics

Community Dynamics:

- Social Conflict: Causes and Management of Conflict

Community Power Structure and Relevance

Leadership in the Community

Unit IV Strategies of Community Work

Steps and Strategies in Community Work

Participatory Techniques:

- PRA, RRA, PLA

Community Resource Mobilization Case Studies

Role of Community Worker and Intervention

Suggested Reading

1. Alison, G. & Marilyn, T. (2011). The Short Guide to Community Development. Jaipur: Rawat Publications
2. Siddiqui, H.Y. (2006). Working with Communities: An Introduction to Community Work. New Delhi: Hira Publications
3. Frielander, W.A (2010). Concepts and Methods of Social Work. Englewood Cliggs: Prentice Hall.
4. Ross, M.G. (1997). Community Organization: Theory, Principles and Practice. Harper and Row
5. Chambers, R. (2002). Rural Appraisal: Rapid, Relaxed and Participatory. Sussex: Institute of Development Studies
6. Ministry of Welfare, GOI. (2010). Encyclopedia of Social Work, Vol, 1&2. New Delhi: Ministry of Welfare, GOI
7. Mukherji, B. (1961). Community Development in India. New Delhi: Orient Longman
8. Siddiqui, H.Y. (1997). Community Organization in India. New Delhi: Harnam
9. Hardcastle, D.A., Powers, P.R. & Wenocur, S. (2004). Community Practice: Theories and Skills for Social Workers. New York: Oxford University Press
10. Weil, M. (1996). Community Practice. Conceptual Models(ed). New York: The Haworth Press. Inc.

12. Eligibility

1. Any person with minimum 45% marks in the aggregate in graduation or its equivalent examination recognized by University of Delhi in any discipline shall be eligible to apply for this course.
2. Candidates belonging to SC/ST categories shall be allowed 5% relaxation in the eligibility requirement.
3. Any other admission criteria as per university notification.

13. Admission Procedure

Admission procedure will take place as per USTM decision.

14. Schedule for Theory Classes and Field Work

Four days for theory classes and two days for concurrent field work will be required in all the semesters. Concurrent field work shall be organized on Thursday and Friday. During the theory classes, besides lectures, individual and/or group conferences will be held regularly.

15. Field Work Practicum

Field work practicum in social work is different from other social sciences. It is an integral part of social work education. Thus, field work practicum is comprised of approximately 30% importance of the total credits. Field work is a practical experience for the students. In field work, field will be settings (a social welfare and/or development agency or open community) which offer

avenues for students' interaction with client and client system, where they will apply social work methods, principles, skills and techniques under the guidance of faculty of the respective college and practitioner of the agency.

16. Components of Field Work

Field work in social work education involves multiple learning pedagogies and activities. The components of field work are:

A. Observation Visits: Students of semester-I & III will be given an opportunity to visit and observe various agency/community settings in order to know about the initiatives of governmental and non-governmental organizations towards social concerns.

B. Orientation Programme: Three-day orientation programme will be organized at the commencement of the course at the beginning of semester-I, semester-III, and semester-V of first, second, and third years respectively before starting concurrent field work. Observation visits to welfare agencies/communities will be an integral part of the orientation programme. Attendance in orientation programme is compulsory.

C. Concurrent Field Work: Concurrent field work is required to be conducted simultaneously with class-room teaching of courses from the very beginning of all the semesters (both odd and even) of all three years and shall continue till the preparation leave before the commencement of the examinations. Two days in a week (Thursday and Friday) will be allotted to the students to perform concurrent field work. The students may be placed in social welfare agencies or open community settings to initiate and participate in the direct service delivery. A minimum of 15 hours (including report writing) per week of the concurrent field work will be required for each student. On the basis of 14-15 weeks of field experience per semester, the students should accumulate minimum 225 hours for I & II year and 250 hours for III year (Including rural camp/skill development workshops). The student is required to adhere to the weekly schedule of the following essential parts of the concurrent field work:

1. **Weekly report submission:** The student is required to prepare learning report of his/her weekly field visits and submit the same on a weekly assigned day to the respective college supervisor without any delay.

2. **Individual conferences/mentorship:** The student is required to meet his/her assigned supervisor on the pre-decided day as per the schedule on weekly basis to discuss his learning assignments. The individual conferences are mentorship programmes to give professional learning experience to each student for their growth.

3. **Group conferences/scientific paper presentations:** The students will be required to present scientific papers or field work experience based papers once in every year. These conferences will provide opportunities to the students to strengthen their presentation skills. In addition, they will also learn to perform the role as a recorder and chairpersons of the scientific sessions.

D. Rural Camp: Approximately five days rural camp will be organized for the students of semester-5 or 6 to provide exposure to the students about the socio-economic, political and cultural situations and realities of rural life. The rural camp will be organized under the guidance of the faculty members. Attendance of rural camp is compulsory.

E. Block Field Work: At the end of semester- IV of the second year, students will be required to undergo four-week block field work training in a social welfare agency or project in or outside Meghalaya. The block field work agencies/projects will be selected with the consent/choice of students. A student preferably to be placed under the supervision of professionally qualified social worker in the agency. A student has to start the block field work on the date specified by the Department of respective College in the placement letter. Any unreasonable delay in joining block field work or discontinuation will be treated as misconduct. If a student leaves block field work agency without prior approval of agency and/or Department or if his/her performance is found to be unsatisfactory, then he/she will have to repeat the block field work. During block field work, a student will be expected to submit the complete report to the departmental supervisor in a prescribed manner.

in the 5th Semester. Leave may be allowed during the period of block field work mainly on the ground of sickness. Successful completion of block field work is mandatory before the Bachelor of Social Work degree can be awarded. The Block field work performance would be included in the field work assessment of the 5th semester.

F. Skill Development Workshops: The skill development workshop is a platform in which the values, principles, methods, techniques, tools etc. are translated into practice i.e, “learning by doing”. Through the experimental learning in the workshop, insights are acquired to develop the personal self and the professional self. The main aim of skill workshops is to build the confidence and strengthen knowledge, skills, aptitude and the attitudinal base of students through the workshops and special sessions. The activities that may be taken under skill workshop are: (i) Role Plays; (ii) Use of motivational songs and other interactive visual media; (iii) Preparation for street plays including script writing/street theatre; (iv) Simulation exercises; (v) Films screening; (vi) Practice of counseling techniques; (vii) Practice of participative techniques; (viii) Workshops on communication; (ix) Mock interviews; (x) Strategic planning for advocacy (xi) lecture series. The skill development workshops are mandatory for final year students in order to complete the credit requirements of the course.

17.1. Criteria for Selection of Field Work Agencies

The following criteria will be used for screening and selecting organizations for field work setting: a) The agency’s philosophy of service must be compatible with the values and ethics of the social work profession and the objectives of field work practicum. b) The Agency must be willing to accept and follow the requirements of the department for participation in the field work practicum. c) The agency must provide social worker/related qualified professional to act as field work supervisor and provide them with the time and resources necessary to fulfill his/her roles. d) The agency must be willing to provide a comprehensive learning opportunity for the students including orientation and learning assignments

17.2. Field Work Placement

The students of all the semesters will be placed under the supervision of a faculty member of the department. The following points should be taken into consideration for the field work placement:

- a) Gender considerations
- b) Agency’s concerns/expectations about the placement; and c) Constraints of students such as - disability, language barrier etc.

Placement of students under the college supervisors will be done as per following modalities:

- a) Placement of students under the departmental supervisor should be done as per the 1:10 teacher-learner ratio in line with UGC guidelines.
- b) Ratio of girls and boys students should be appropriately distributed among all the departmental supervisors
- c) Student should not repeat the departmental supervisor; and
- d) Equal numbers of students from each class should be given to all the college supervisors. The field work agency of the students will remain the same for two consecutive semesters of a year.

17.3. Field Work Supervision

Supervision is the most significant aspect of field work practicum. The supervisor must strive to:

- a) Prepare a schedule of meeting with students.
- b) Help the students in preparing learning plan.
- c) Help the students to develop maturity in dealing with different circumstances and learn to appreciate and respect multiplicity and diversity of society, culture and communities.
- d) Help them to grow as professional social workers, conscious about the demands of the profession and develop capability to handle situations independently.
- e) Monitor continuously the progress of students and provide feedback to them about the

performance.

- f) Arrange periodic visits and meetings with agency supervisor wherein the proposed course of action by the student is discussed and an affirmative response is obtained from the agency.
- g) Read and check the field work reports and provide necessary feedback to the students regarding report writing.
- h) Develop insight into the process of social work intervention using social work philosophy, principles, methods and skills.
- i) Provide regular, timely and systematic inputs.

Field work supervision inputs are made at different levels. Each student should get half an hour of supervision per week with the respective college supervisor on a planned basis. These hours of supervision will be essentially calculated in total teaching hours of a college supervisor as per the number of students placed under him/her. Generally three major method of supervision are: Individual Conference (IC); Group Conference (GC); and Agency Visits. Individual Conference (IC) is a tutorial approach to fieldwork supervision. It is a medium through which the college supervisor provides the individually planned educational experience. Group Conference (GC) is organized with the intention to strengthen the knowledge of students by learning from experience of other students.

17.4. Field Work Attendance

The students in this course are being trained to become professional social workers. They are expected to meet the following responsibilities related to attendance: a) The Department expects students to be regular and punctual in the field work. Only in special cases, there is a provision of leave from field work on the grounds of sickness or important personal reasons. Leave from field work should generally be applied in advance. All leave applications should be addressed to the college supervisor. In case, a student is unable to attend field work due to physical problem, he/she must arrange to send message as soon as possible to the agency as well as college supervisor. b) A student is not required to attend field work on college holiday, however, it may be utilized under the guidance of the college supervisor and all such days could be called additional field work. c) Minimum eighty percent (80%) attendance in the concurrent field work is compulsory. d) Attendance of all the components of field work i.e. orientation programme, individual conferences, group conferences, rural camp, skill development workshops, special lectures and seminars is also compulsory. e) In case, a student is unable to attend scheduled thirty days of concurrent field work in a semester, he/she is expected to compensate the same and this option should be exercised with prior intimation to and approval of the college supervisor.

17.5. Submission of Field Work Records/Assignments

The students are expected to fulfill the following responsibilities related to submission of records/assignments: a) To prepare and submit learning plan, agency/community profile in a timely and appropriate manner to both department and agency supervisor. b) To maintain a cumulative record of actual hours spent at the field work. c) To complete and submit weekly records of concurrent field work in a prescribed manner. d) To prepare and submit records of observation visits, orientation programme, field visits, rural camp, skill development workshops etc. separately. e) To complete and submit field work self-assessment form after termination of field work.

17.6. Assessment of Field Work

At the end of all the semesters, a field work assessment will be done both internally and externally. The internal field work assessment is a continuous process. The students are required to submit their weekly report to the respective supervisors. Any delay in report submission will bring disadvantage to the students. Their learning will be monitored through weekly individual interactions with the assigned supervisors. The students will also be assessed on the basis of their performance for presenting their field work experienced based or scientific paper. At the end of the semester, students will be required to prepare a field work self-assessment report as per the guidelines in a prescribed form and submit the same to the respective college supervisors. The college supervisors will also prepare an assessment report regarding the performance of the concerned students on the basis of his/her learning and performance throughout the semester.

Assessment of field work shall be on the basis of:

Field Work (Internal supervisors) 70 marks

Viva-Voce (External examiner) 30 marks

17.6.1. Internal Assessment of Field Work:

The student should be assessed for efforts and progress towards task assigned from one point to another in the learning process during the field work. The students with assistance from their respective departmental supervisor will develop a learning plan for field work that encompasses the activities those are specific to that agency. At the end of each semester, the students and their college supervisors will meet to review the student's progress and accomplishment. The marks should reflect the students achievements in terms of completion of the tasks and assignments and demonstration of proficiencies required for field work. Internal Assessment marks of the field work shall be moderated by the Department moderation committee. The following are the parameters of internal assessment of field work:

Learning Outcomes-Based Curriculum Framework (LOCF) for Under Graduate Programme

BACHELOR OF BUSINESS ADMINISTRATION (BBA)

(SYLLABUS Effective from 2021 Admission Onwards)



**DEPARTMENT OF BUSINESS ADMINISTRATION
UNIVERSITY OF SCIENCE AND TECHNOLOGY, MEGHALAYA
2021**

PREAMBLE

The role of higher education is vital in securing the gainful employment and providing further access to higher education comparable to the best available in the world-class institutions elsewhere. The improvement in the quality of higher education, therefore, deserves to be given top-most priority to enable the young generation of students to acquire skill, training and knowledge to enhance their thinking, comprehension and application abilities and prepare them to compete, succeed and excel globally. Sustained initiatives are required to reform the present higher education system for improving and upgrading the academic resources and learning environments by raising the quality of teaching and standards of achievements in learning outcomes across all undergraduate programs in science, humanities, commerce and professional streams of higher education. One of the significant reforms in the undergraduate education is to introduce the Learning Outcomes-based Curriculum Framework (LOCF) which makes it student-centric, interactive and outcome-oriented with well-defined aims, objectives and goals to achieve. The University Grants Commission (UGC) took the initiative of implementing the LOCF in the Colleges and the Universities of the country. Accordingly, the University of Science and Technology, Meghalaya has decided to implement the LOCF in all its departments under the auspices of Internal Quality Assurance Cell (IQAC).

GRADUATE ATTRIBUTES (GAs)

The Graduate Attributes (GAs) reflect particular qualities and abilities of an individual learner including knowledge, application of knowledge, professional and life skills, attitudes and human values that are required to be acquired by the graduates of University of Science and Technology, Meghalaya. The graduate attributes include capabilities to strengthen one's professional abilities for widening current knowledge and industry-ready skills, undertaking future studies for global and local application, performing creatively and professionally, in a chosen career and ultimately playing a constructive role as a socially responsible global citizen. The Graduate Attributes define the characteristics of learners and describe a set of competencies that are beyond the study of a particular area and programme.

The GAs of University of Science and Technology, Meghalaya

- Continue life-long learning as an autonomous learner
- Continuously strive for excellence in education
- Apply and nurture critical and creative thinking
- Promote sustainable development practices
- Promote co-operation over competition
- Balance rights with responsibilities

- Understand and respect diversity & difference
- Not be prejudiced by gender, age, caste, religion, or nationality.
- Use education as a tool for emancipation and empowerment of humanity

Department of Business Administration

Established under the superintendence of the University of Science and Technology, Meghalaya in 2012 part of the ¹⁰School of Business Sciences. The one of the largest teaching departments of the University of Science and Technology, Meghalaya in terms of the number of regular students Offers both MBA with dual specialization in Marketing, Human Resource, Finance, Entrepreneurship and Agri-business, BBA with single specialization in Marketing, Human Resource, Finance and Master in Hospital Administration and Ph.D. programmes. The department also extends consultancy services to Government departments also.



PROGRAMME REGULATION AND SYLLABUS

For those who joined in 2021 -2022 onwards

Program: Bachelor of Business Administration (**BBA**)

Programmes Offered:

BBA in Marketing

BBA in Human Resources

BBA in Finance

Duration: Three years Full Time (Each year having Two Semesters)

Medium of Instruction and Examinations: English only.

Eligibility for Admission:

- A. The candidate should have passed the higher secondary from any Indian institution or schools, under the regular stream, shall be in the 10+2 pattern. In all the cases the student should have passed the higher secondary examination with not less than 45% marks/equivalent grade from all discipline i.e., Science, Arts and Commerce are eligible for admission. SC/ST, economically weaker and differently abled candidates shall be given relaxation as per university rules.
- B. The scores obtained during the previous academic year i.e., in higher secondary alone is considered.
- C. Head, Department of Business Administration is entrusted to conduct the Group discussion and Personal interview at Department for finalising the admission list.
- D. Reservation of seats is considered as per the Government of India and University of Science and Technology norms from time to time.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Programme Educational Objectives (PEOs):

Upon completing the degree, the student will be able to:

PEO 1	Analyze social and environmental aspects with professional values, ethics and equity to transform the learned and acquired knowledge, skills and expertise to the community.
PEO 2	Involve in lifelong learning to adapt educational needs in a changing world to maintain their competency and also to contribute to the advancement of knowledge in a multi-disciplinary environment.
PEO 3	Learn to adapt to a rapidly changing environment with learned and applied new skills
PEO 4	This programme will equip the candidate to be socially responsible and value driven citizens committed to sustainable development
PEO 5	To inculcate the spirit of team work, integrity, professional values so that the student will be able to perform effectively in an organizational set up or on their own entrepreneurial ventures.

PROGRAMME OUTCOMES (POs)

Programme Outcomes (POs): Upon completing the degree, the student will be able to:

PO 1	Demonstrate the ability to perform professionally in organizations or start-ups.
PO 2	Perform in a social, cultural and ethical responsibility as an individual or as a member of a team in a professional manner.
PO 3	Exude positive attitude in all the sectors and are willing to support any professional initiatives with positive mind-set.
PO 4	Adapt to sustain in emerging era and constantly upgrade skills towards independent and Lifelong learning.
PO 5	Communicate complex concepts with professionalism by adapting appropriate resources and modern tools.
PO 6	Able to document their participation and contribution to student organizations, business or consulting projects, internship opportunities or other initiatives.
PO 7	Able to conceptualize, organize and resolve complex business problems or issues by using the resources available under their discretion.
PO 8	Understand the impact of the professional management solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 9	Able to identify, assess and shape entrepreneurial opportunities and to evaluate their potential for business success.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Programme Specific Outcomes (PSOs):

At the completion of the programme, the students will be able to:

PSOs 1	It would develop the knowledge and skill related to Management, Finance, Marketing, HR, Business Law and IT.
PSOs 2	It will help develop the attitude for solving various problems faced in a business enterprise.
PSOs 3	It will enable them to understand the different challenges and opportunities in the different disciplines of management.
PSOs 4	Development of attitude for teamwork, leadership and learning in a business enterprise
PSOs 5	It will develop the communication, presentation and business reporting skills.
PSOs 6	It will enable the students to learn the fundamental application on computers like MS Office, internet, ecommerce, etc.

PROGRAMME STRUCTURE

Part	Course Code	Name of the Course	Credit	Marks Allotted		
				Internal	External	Total
Semester -I						
Core 1	BBA 101	Business Communication	4	30	70	100
Core 2	BBA 102	Principles of Management	5	30	70	100
Core 3	BBA 103	Business Environment	5	30	70	100
Core 4	BBA 104	Business Economics	5	30	70	100
Core 5	BBA 105	Computer Fundamental	4	30	70	100
Total for semester -I			23	150	350	500
Semester -II						
Core 6	BBA 201	Human Resource Management	5	30	70	100
Core 7	BBA 202	Marketing Management	5	30	70	100
Core 8	BBA 203	Financial Accounting	5	30	70	100
Core 9	BBA 204	Quantitative Techniques	5	30	70	100
Core 10	BEV 720	Environment Studies	4	30	70	100
Total for semester -II			24	150	350	500

Semester -III						
Core 11	BBA 301	Organizational Behaviour	5	30	70	100
Core 12	BBA 302	Cost & Management Accounting	5	30	70	100
Core 13	BBA 303	Business Law	5	30	70	100
General Elective 1	BBA 304	Entrepreneurship and Small Business Management/Agri Business Management	5	30	70	100
Core 14	BBA 305	Management Information System	5	30	70	100
Total for semester -III			25	150	350	500
Semester -IV						
Core 15	BBA 401	Financial Management -1	5	30	70	100
General Elective 2	BBA 402	International Business/ International Marketing	5	30	70	100
Core 16	BBA 403	Management of Services	5	30	70	100
AEC (S) 1	BBA 404	Enterprise Resource Planning	4	30	70	100
Core 17	BBA 405	Research Methods	5	30	70	100
Total for semester -IV			24	150	350	500
Semester -V						
Core 18	BBA 501	Fundamentals of Production & Operations Management	5	30	70	100
AEC (S) 2	BBA 502	Retail Management/ Knowledge Management/Stock Market Operation	4	30	70	100
DCE 1	BBA - 503 A	Advertising And Sales Promotion	5	30	70	100
DEC 2	BBA - 503 B	Manpower Planning	5	30	70	100
DEC 3	BBA - 503 C	Indian Financial System	5	30	70	100
DEC 4	BBA - 504 A	Rural Marketing	4	30	70	100
DEC 5	BBA - 504 B	Compensation Benefits	4	30	70	100
DEC 6	BBA - 504 C	Financial Management - II (Corporate Finance)	4	30	70	100
CORE 19	BBA - 505	Project Report	5	50	50	100
Total for semester -V			41	290	610	900
Semester -VI						
Core 20	BBA- 601	Strategic Technology Management	5	30	70	100
AEC (S) 3	BBA- 602	Market Research/ HRIS/ Mutual Fund or Pinnacle	4	30	70	100
Core 21	BBA -603	Financial Institutions and Markets	5	30	70	100
DEC 7	BBA - 604 A	Service Marketing	4	30	70	100

DEC 8	BBA - 604 B	Change Management	4	30	70	100
DEC 9	BBA - 604 C	Financial Services	4	30	70	100
DEC 10	BBA - 605 A	E- Marketing	5	30	70	100
DEC 11	BBA - 605 B	Industrial Relation	5	30	70	100
DEC 12	BBA - 605 C	Working Capital Management	5	30	70	100
Total for semester -VI			41	270	630	900
(40% in total for pass in a course, minimum 12 marks required in internal, 28 marks required to pass in external examination out of 70)						

(A student can opt for one stream of electives. A minimum of five candidates are required for registering for an elective course.) In lieu of the Generic courses, for BBA the students have to undertake two MOOC courses which will be counted as 4 credits. They need to complete the same during the course of the programme. HOD will certify the same at the end of the fourth semester and based on that only the final mark list will be released.

1. INTERNAL EVALUATION

For the Theory Courses, the break-up of marks shall be as follows:

Internal examinations (Av. Of best 2 out of three): 15 marks

Students' participation: 10 marks

Assignment: 9 marks

Total: 30 marks

A student will be allowed to write the end semester examination only if he obtains the minimum attendance stipulated by the University.

2. EXTERNAL EVALUATION:

An external evaluation of 70 marks will be conducted by the University in all four semesters for the courses excepting the Project work and Comprehensive viva which is conducted by Department but for External expert, Examination branch of the University does the required communication.

The Pattern of Examination

PART A: This part consists of 20 number of Multiple-Choice Questions: **20 x 1=20 marks**

PART B: This part contains total 8 number of questions, where Q. No. 1 is compulsory in nature and any four questions have to attempt from rest of 7 number of questions carrying 10 marks by each question: **10 x 5=50 marks**

Pass minimum is as per the University regulations.

3. GENERIC COURSES:

A student has to complete one compulsory electives during the three years from other departments where his/her choice of subject is available. Department of Business Administration will propose the electives to students and have to opt one elective and can complete during the course of the programme.

4. PROJECT WORK: Details are given along with the syllabus in Annexure

5. TRANSITORY REGULATIONS:

Wherever there has been a change of syllabus, examinations based on the existing syllabus will be conducted for two consecutive years after implementation of the new syllabus in order to enable the students to clear the arrears. Beyond that, the students will have to take up their examinations in equivalent subjects, as per the new syllabus, on the recommendation of the departmental council.

6. Any other regulations not found in this; the University's regulations will come into force.

7. Notwithstanding anything contained in the above pages as Rules and Regulations governing the Three-Year Bachelors' Programme, the Syndicate is vested with the powers to revise them from time to time on the recommendations of the Board of Studies as approved by Academic Council of the University.

SEMESTER -I						
CORE 1: BUSINESS COMMUNICATION						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 101	Business Communication	Concept	50	10	0	4
Preamble: This course aims at facilitating the platform to improve and enhance student's communication skill, listening skill, presentation skill and writing skill effectively so that after completion of this course the students can communicate effectively and in well-mannered for any kind of professional and business talk.						
Prerequisite: Basic knowledge and understanding of English language, English grammar and communication.						
Course Out Comes (COs): Students will communicate effectively and professionally at regional, national and global platform.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the basic principles and importance of business communication.					K2
CO2	Learn to classify the different types of communication					K3
CO3	Learn and write all the basic business communication formats					K3
CO4	Learn different oral communication skills and deliver in different business environment					K4
CO5	To stimulate the Critical thinking by designing and developing clean and lucid writingskills.					K3

Mapping the Programme Outcomes															
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
1	Definitions, Process of communication, Communication Model, Objectives of communication, Principles of communication, Importance of Business communication, Importance of Feedback	10	Black Board Teaching/ Discussion among groups

2	Channels of communication, Types of communication, Dimensions of communication, Barriers to communication, Verbal, Non-Verbal, Formal, Informal communication- advantages and disadvantages	14	Black Board Teaching/Video clip/ Group assignment/ Role Play
3	Business Letters: Enquiries and replies, Placing and fulfilling orders, Complaints and follow-up, Sales letters, Circular letters, Application for employment and resume, Report writing, Notices, Agenda and Minutes of the Meetings, Memos	13	Black Board Teaching/ Writing practice
4	Meaning, nature and scope, Principles of effective oral communication, Techniques of effective speech, Media of oral communication: Face-to-face conversation, Teleconferences, Press Conference, Demonstration, Radio Recording, Dictaphone, Meetings, Rumour, Demonstration and Dramatisation, Public address system, Grapevine, Group Discussion, Oral report, Closed circuit TV, The art of listening - Principles of good listening.	15	Black Board/ Role Play/ Skit play/ Presentation/ Movie clip play/ Conduct Interview session
5	Case Study	8	Case Study of various organisation
Total		60	
Reference Books:			
1. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.			
2. Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan - Tata McGraw-Hill Publishing Company Limited, New Delhi.			
3. Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -I						
CORE 2: PRINCIPLES OF MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 102	Principles of Management					5
Preamble: This course aims at facilitating the students with the knowledge of management, its mechanism and importance and role of human being as employee of organisation in performing various functions.						
Prerequisite: Basic knowledge and understanding of Management field.						
Course Out Comes (COs): Students will attain a general level of competence in management and to enable them to act with creative, innovative and entrepreneurial potentials with management tools.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To give students knowledge about basic concept of Management and its importance.					
CO2	Students will understand the importance of planning as a primary management function as well as the importance of MBO in today's world.					
CO3	To impart knowledge to students on structure of organisation and functional division and interlink between structure and functions of organisation.					
CO4	To give knowledge on whole mechanism of staffing and its importance as a managerial function in organisation.					
CO5	To make understand the students the importance of Leadership and professional communication as key functions in organisation and how they can define success of an organisation.					

Mapping the Programme Outcomes															
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content

1	Management: Definition, characteristics and nature, Objectives and purpose. History of Management thought. Management as a science and art. Functions of Management. Role of a manager, Managerial skills.	11	Black Board Teaching/ Video clip to show organisation ambience
2	Nature and Purpose of Planning, significance and limitations of planning, Types of plans, steps in planning. MBO- Definition, the process of MBO, Benefits and weakness of MBO.	13	Black Board Teaching/Video clip/ Group assignment/ Case Study (Issue discussion)
3	Formal and informal organizations, Organizational division – the department, organization levels and the span of Management, factors determining an effective span, Authority and Power: types of power, line and staff concepts, centralization and decentralization.	17	Black Board Teaching/ Case study
4	Staffing: Definition of staffing, Importance of staffing. Recruitment: Definition, Sources of man power Recruitment, factors influencing recruitment. Selection – definition, steps in selection process, selection Test, types of interviews, Induction and placement. Directing: Concepts and Importance.	17	Black Board/ Conduct Interview session
5	Leadership: Introduction, characteristics, importance, qualities & styles, leader and manager. Communication: Definition, importance, communication process, elements of communication process, formal and informal communication, barriers of communication. Control: Concept, steps in controlling, importance of control, types of control.	17	Black Board/ Case Study of various organisation
Total		75	
Reference Books:			
1. Tripathi P C & Reddy P N, Principles of Management, Tata McGraw Hill			
2. Koontzn, H. and O' Donnel C. Essential of Management – Tata MGH.			
3. Sherlerkar S A, Modern Business Organization and Management, Himalaya Publishing			
4. Bora C, Principles of Management, Kalyani Publishers			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -I						
CORE 3: BUSINESS ENVIRONMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 103	Business Environment					5
Preamble: This course aims at facilitating the students with the knowledge of business environment specially along with other associated elements of it and how various policy of government influence trade, industry and financial position at regional, national and international level.						
Prerequisite: Basic knowledge of social environment and business environment						
Course Out Comes (COs): To provide knowledge of the environment in which businesses operate, the economic operational and financial framework with particular application to the transaction of business.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Discuss the supply and demand theory and its impact on business environment.					
CO2	Explain the effects of government policy on the economic environment.					
CO3	Outline how an entity operates in a business environment.					
CO4	Describe how financial information is utilized in business					
CO5	Explain the legal framework that regulates the economic framework of an industry.					
CO6	The students will be able to demonstrate and develop conceptual framework of business environment and generate interest in international business					

Mapping the Programme Outcomes															
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Components of business environment-	13	Black Board

	external, internal, micro, macro, social, economic, legal, demographic and political (emphasis on economic environment). Importance of Five-year plans, merits and limitations, major policies and resource allocation in 10th and 11th Five-year plan.		Teaching/ Critical discussion on Govt. policies and Role of NITI Ayog
2	Historical development with emphasis on 1956 policy, Industrial Policy 1991, Licensing policy 1991, Small Scale Industrial Policy 1991, Industrial Policy for North-East. Major Industries in India- Steel, Cement, Textile, Tourism and IT. Industrial sickness-causes and remedies	11	Black Board Teaching/Video clip/ Group assignment/ Case Study (Issue discussion)
3	Trends in world Trade and problems in developing countries (India). Current EXIM policy, Trend of Trade and Balance of Payment, Trade relations with USA, European Union and SAARC, NAFTA. International economic institution – WTO, WORLD BANK, IMF, ADB.	14	Black Board Teaching/ Video clip
4	Structure and characteristics of Indian Financial System. Reserve Bank Of India- functions and roles of RBI, monetary policy of RBI, techniques of monetary control—bank rate, cash reserve ratio, statutory liquidity ratio, open market operations. Securities and Exchange Board of India: Organization, Functions and objectives. Commercial banks: functions, roles and structures of commercial banks of India. Cooperative banks— features, type, structure and growth of cooperative banks. Development banks—role and performance of ICICI, IDBI, IFCI, UTI, EXIM bank of India, NABARD.	19	Black Board/ Video clip
5	Call money market in India, commercial bills market (bill of exchange, trade bills, commercial bills, bill rediscounting), treasury bills market (features, types, limitations), commercial paper markets (advantage and framework of Indian commercial paper markets), certificate of Deposit market (features, certificate of Deposit in India). Basic structure and a brief knowledge on the Institutions of money market including mutual funds. Capital Markets: Significance, dimensions, institutions and structure. Instruments of Capital market—equity/ ordinary shares, preference shares, debentures or bonds.	18	Black Board/ Case Study of various organisation
Total		75	
Reference Books:			
1. Ashwathapa, K, Essentials of Business Environment, Himalaya Publishing House, 2005.			
2. Dutta and Sundaram, Indian Economy, S Chand and Sons, New Delhi, Latest edition.			
3. Ray S K, The Indian Economy, Prentice Hall of India, latest edition			
4. M Y Khan, Indian Financial System, Tata McGraw Hill, 5 th ed or later.			

5. R Mathur, Indian Financial System, Sublime Publications, latest edition.
Focus of Course: Employability
e-Content: Vidya-mitra/ e-Pathshala/Rajya Sabha portal

SEMESTER -I						
CORE 4: BUSINESS ECONOMICS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 104	Business Economics					5
Preamble: This course aims at facilitating the students with the knowledge of economic activities as well as business activities of market and companies and how these activities regulate a market at national and global platform.						
Prerequisite: Basic knowledge of economics and economic activities of a market.						
Course Out Comes (COs): To integrate the basic concepts of economics with the tools of mathematics and statistics in order to analyze and make optimal business decisions.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the basics of business economics					
CO2	Familiarise with the concept of supply and demand					
CO3	Learn the different laws of production and different types of costs in business					
CO4	Acquainted with different types of market and its operation					
CO5	Understand international and inter regional trade, identify and understand various trade theories, analyze the various types of restrictions of international trade.					

Mapping the Programme Outcomes															
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Economic principles and the practice of management, Role and responsibilities of Business economists	10	Black Board Teaching/ Video clip
2	Demand: Meaning of Demand, Types of demand,	20	Black Board

	Determinants of demand, Demand function, Demand elasticity, Demand forecasting, Supply: Meaning of Supply, Determinants of Supply, Elasticity of Supply, Types of Elasticity of Supply		Teaching/Video clip/
3	Production: Factors of Production and their functions, Linear homogenous production Function: Optimum Input combination, Law of variable proportions and returns to scale Economics and diseconomies of scale, Total, average, marginal, long run and short run cost, Opportunity cost, Cost function – Cost – Outputs relationship – managerial uses of cost function	20	Black Board Teaching/ Video clip
4	Price and output determination under different market structures – Perfect competition, Monopoly, Monopolistic competition, Oligopoly, Price discrimination Profit theories, Nature of profit, Measurement of profit Business Cycle: Types of business cycle, Phases of business cycle, Managerial Implications of Business Cycle.	15	Black Board/ Video clip
5	Cases will be discussed based on relevant above-mentioned topics.	10	Case Study of various organisation
Total		75	
Reference Books:			
1. Indian Economy- Dutta & Sundarm			
2. Principles of Economics- M L Sheth			
3. Economics- Paul Samuelson			
4. Managerial Economics-R. L. Varshney			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala/e newspaper			

SEMESTER -I						
CORE 5: COMPUTER FUNDAMENTALS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 105	Computer Fundamentals					4
Preamble: This course aims at facilitating the students with the knowledge of computer and enhancing the skill of use and application of basic software of MS office which is extensively use in preparing data house of organisation.						
Prerequisite: Basic knowledge and use of habit of computer.						
Course Out Comes (COs): The objective of this course is to help students understand the concepts of computer basics. The course will stress on fundamental knowledge about computer software and hardware, with a practical exposure to Microsoft Office.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Bridge the fundamental concepts of computers with the present level of knowledge of students.					
CO2	Understand the history of computers, memory and concept of input and output devices of computers and how it works.					
CO3	Familiarize with software, operating systems, peripheral devices, networking, multimedia and internet					
CO4	Understand binary, hexadecimal and octal number systems and their arithmetic					
CO5	This will familiarize the students with the computer and its applications in the relevant fields and also to make them aware of other related papers of IT					

Mapping the Programme Outcomes															
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content

I	Introduction to Computers, Advantages and Characteristics of Computers in Business. History and Generations of Computing, Classifications of Computers, Basic Component and Block Structure of the Computers, Memory devices, Processing units, Types of Usage of Computer in Business, Different Number System, Digital mode of Communications	11	Black Board Teaching/ Hands on practical
2	Definition of Software, Advantages and Requirement of Software, Classification of Software, Definition of Operating System, Firmware, Application Software and Utility Programs, Introduction to Windows Operating System and Classifications, Introduction to Linux and Unix System and Classifications, Application of Application Software in Trade and Commerce	11	Black Board Teaching/Video clip/ Hands on training
3	Different input Devices and their functionalities, Introduction of Shortcut Keys and their Usages, Introduction of Control Keys and their Usages, Operations of Output devices and their types, Introduction of Basic operations of Computer – preparing document, Filling operations, Photo Formatting and others	10	Black Board Teaching/ Video clip/ Hands on training
4	Introduction of Text Editor, Document Editor, Introduction to Microsoft Office Package, Introduction to MS-Word, Application of MS-Word – Mail Merge, Template Documentations, Wizard Applications. Introduction to Spreadsheet Software, Delimitations of MS Excel Workbook, Applications of Pivot table, Data and Formula Applications, Formatting with Excel Spreadsheet and Others. Introduction to MS PowerPoint Presentation, Basic Formatting in PowerPoint, Advanced Formatting, Using Templates. Introduction to Open Office package, application of Office Clack, Office-Presents	14	Black Board/ Video clip/ Hands on training
5	Definition of Network and its applications in business, Definitions and applications of file sharing, Introduction to Internet and their applications in trade practice, Definitions of browsers and their types, Meaning and different type of Pop-up, hand hold utilities, Definition of Internet of Things. Internet Information Services (IIS), Component of User-Friendly environment in Web practice	14	Black Board/ Video clip/ Hands on training
Total		75	
Reference Books:			
1. Fundamentals of Computers – V. Rajaraman, PHI			
2. Fundamentals of Information Technology – Deepak Bharihoke, Excel Books			

Focus of Course: Skill/Employability
e-Content: Vidya-mitra/ e-Pathshala/ You-tube

SEMESTER -II						
CORE 6: HUMAN RESOURCE MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 201	Human Resource Management					5
Preamble: This course aims at enable the leaners to learn the importance and possibility of using bookies knowledge in organisation in practical form and in addition to these learners will familiar with some practical functions like Recruitment and selection, Training and performance appraisal which are carried out in day to day basis in organisation.						
Prerequisite: Basic knowledge of Management and its functions.						
Course Out Comes (COs): To develop globally competent and socially responsible leaders and entrepreneurs throughWorld-class education						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Acquire knowledge and skills in the field of human resource management and human relations and to comprehend applicability of human resource management principles to situationin global business world					
CO2	Apply the entrepreneurial and management skills for effective business management and acquire employability skills through the practical awareness in the business					
CO3	Understand the concept and nature of human resource management and personnel management					
CO4	Analyze the difference between recruitment and selection process					
CO5	To give them knowledge about advance concept of HRM strategies, HRM & its various models, Wage & salary administration etc.					
CO6	Understand the various training methods and techniques in the business for effective decision making.					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Introduction and Meaning, Definition, Objectives, Nature of HRM, Need for HRM Approach, Importance of HRM, HRM and Personnel Management, Scope of HRM, Limitations of HRM, System Approach to HRM, HRM System, Organizational Design, HRM Environment: External Environment & Internal Environment, Jobs and career in HRM	15	Black Board Teaching/ e-Pathshala
2	Introduction and Meaning, Definitions, Nature, Objectives, Challenges to Personnel Management, Functions of Personnel Management: Managerial Functions & Operative Functions, Personnel Policy: Factors, Objectives and Principles	16	Black Board Teaching/ e-Pathshala
3	Introduction and Meaning, Definitions, Purposes and Importance, Process of Recruitment, Recruitment Policy, Situational Factors Affecting Recruitment, Sources of Recruitment: External Sources & Internal Sources, Methods of Recruitment, Recent Trends in Recruitment. Introduction and Definitions of Selection, Essentials and Significance of Selection, Selection Process	17	Black Board Teaching/ e-Pathshala
4	Introduction and Meaning, Definitions, Training & Development, Objectives, Need and Importance, Benefits, Steps in Systematic Training Plan, Training Methods and Techniques: On- The –Job Training and Off-the-Job Training, General Principles of Training	12	Black Board Teaching/ e-Pathshala
5	Introduction and Meaning, Definitions, Features, Objectives, Benefits and Limitations of Performance Appraisal, Performance Appraisal Process, Methods of Performance Appraisal, Essentials of an Effective Appraisal System	15	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. C. B. Memoria: Personnel Management			
2. Edwin B. Flippo: Principles of Personnel Management			
3. Shashi K. Gupta & Rosy Joshi: Human Resource Management			
4. Aswathappa K, Human Resource Management, Tata McGraw Hill Ltd, 6th edition, 2011			
5. Pattanayak B, Human Resource Management, PHI Learning Pvt. Ltd. 3rd Edition, 2012			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -II						
CORE 7: MARKETING MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 202	Marketing Management					5
Preamble: This course aims at enable the leaners and facilitating to learn about Market, its behaviour and behavior of consumer, physical distribution, role of price and promotion in defining the success of any product in market.						
Prerequisite: Basic knowledge and idea of various activities of market.						
Course Out Comes (COs): The objective of this course is to facilitate understanding of the conceptual framework of marketing and its applications in decision making under various environmental constraints						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the framework of the subject, its need and importance					
CO2	Learn about the behavioural aspects of the consumers and understand the different bases of segmentation					
CO3	Understand and analyse the different strategies and decisions pertaining to product and price					
CO4	Learn about the different distribution channel strategy and different aspects of physical distribution of products					
CO5	Analyse marketing case lets and provide solution to the problems in the case.					
CO6	Apply contemporary marketing theories to the demands of business and management practice					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Nature and Scope of Marketing – Importance of marketing as a business function and in the economy, Marketing concepts of traditional and modern – Selling vs. Marketing, Marketing Mix, Marketing Environment	12	Black Board Teaching/ e-Pathshala
2	Nature, Scope and Significance of consumer Behaviour, Market segmentation concept and importance, Bases for market segmentation	13	Black Board Teaching/ e-Pathshala
3	Concept of product, consumer and industrial goods, Product planning and Development, Packaging- Role and functions, Brand Name and Trade Mark, After Sales service, Product life cycle concept, Importance of price in the marketing mix – Factors affecting price of a product/Service, Discounts and rebates	18	Black Board Teaching/ e-Pathshala
4	Distribution channels – concept and role, Types of distribution channels, Factors affecting choice of a distribution channel, Retailer and wholesales, Physical distribution of goods, Transportation, Warehousing – Inventory Control – Order processing	15	Black Board Teaching/ e-Pathshala
5	Methods of promotion, Optimum promotion mix, Advertising media- their relative Merits and limitations, Characteristics of an effective advertisement, Personal selling as a Career. Function of a Salesman and Successful sales person	17	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Kotler P, <i>Marketing Management</i> , Pearson			
2. Pillai R S, Bagavathi, <i>Modern Marketing: Principles and Practices</i> , S Chand			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -II						
CORE 8: FINANCIAL ACCOUNTING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 203	Financial Accounting					5
Preamble: This course aims at enable the leaners and facilitating to learn about functions of accounting, keeping records of various transactions and also knowledge on accounting errors and depreciation.						
Prerequisite: Basic knowledge and idea of Accounts terminology, transactions and Finance.						
Course Out Comes (COs): The objective of this course is to expose the students to the applied aspect of accounting andmaking them familiar with the techniques of using accounting information for decision making						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	It explains the general purposes and functions of accounting					
CO2	Helps in understanding the main elements of financial accounting information – assets, liabilities, revenue and expenses					
CO3	It helps the students in identifying the main financial statements and their purposes					
CO4	Integrate theoretical and technical accounting knowledge in a business context					
CO5	Exercise judgement under supervision to provide possible solutions to routine accounting problems in straightforward contexts using where appropriate social, ethical, economic, regulatory, sustainability, governance and global perspectives.					
CO6	Develop the ability to use accounting information to solve a variety of business problems					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Need, Development and Definition of Accounting; Book-keeping and accounting. Persons interested in Accounting; Disclosures, Branches of accounting; Objectives of Accounting	13	Black Board Teaching/ e-Pathshala
2	Accounting Cycle; Journal; Rules of debit and credit; Compound journal entry; Opening entry; Relationship between journal and ledger; Rules regarding posting; Trial balance; Sub division of journal	16	Black Board Teaching/ e-Pathshala
3	Accounting concepts and Income measurement; Capital and Revenue - Classification of Income; Classification of expenditure; Classification of Receipts expired cost and Income measurement; Final Accounts, Manufacturing account, Trading account; Profit & Loss account, Balance Sheet, Adjustment entries. Concepts on Accounts of Non – Trading Institutions	18	Black Board Teaching/ e-Pathshala
4	Classification of errors; Location of errors; Rectification of errors; Suspense account; Effect on Profit; Rectification of Errors	13	Black Board Teaching/ e-Pathshala
5	Causes of Depreciation; Depreciation and Depletion, Amortization and Dilapidation; Depreciation Accounting; Methods of Recording Depreciation	15	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Maheswari S N, <i>Financial and Management Accounting</i> , Sultan Chand			
2. Sehgal A & Sehgal D, <i>Fundamentals of Financial Accounting</i> , Taxmann			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -II						
CORE 9: QUANTITATIVE TECHNIQUE						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 204	Quantitative Technique					5
Preamble: This course aims at enable the leaners and facilitating to learn about statistical software application for analysis and representation of data of organisation, sampling technique and use of probability in managerial decision taking process.						
Prerequisite: Basic knowledge on Mathematics and Statistics						
Course Out Comes (COs): Understand why statistics are important for making business decisions and demonstrate a sound knowledge of statistical terms Also, they must be able to explain the merits and limitations of various statistical techniques						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand statistical inference in relation to business decision-making					
CO2	Analyse output from both specialist and general methods					
CO3	Produce quantitative analysis using specialist procedure					
CO4	Convey the results of quantitative analysis					
CO5	Solve a range of problems using the techniques covered					
CO6	Conduct basic statistical analysis of data					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Introduction; applications of quantitative techniques in managerial decision making; Classification and Tabulation of data; Diagrammatic and Graphic Presentation of Data.	10	Black Board Teaching/ e-Pathshala/ Hands on training

2	Measures of central tendency: Mean, Median, & Mode, Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation & Coefficient of Variation (C.V)	16	Black Board Teaching/ e-Pathshala/ Hands on training
3	Elementary concepts of probability including addition and multiplication theorem, simple problems	12	Black Board Teaching/ e-Pathshala/ Hands on training
4	Origin and Development of Operation Research, Phases, Models and Methodology of O.R, Formulation of Linear Programming Problems, solution of LPP by Graphical and Simplex Method	20	Black Board Teaching/ e-Pathshala/ Hands on training
5	Concepts, definitions and methods related to sampling, Time Series Analysis [Problems are not to be touched only suitable real-life examples are to be discussed], Correlation & Regression Analysis (concepts)	15	Black Board Teaching/ e-Pathshala/ Hands on training
Total		75	
Reference Books:			
1. Agarwal D R- <i>Quantitative Methods</i> , Vrinda Publications (P) Ltd			
2. Srivastava U K, Shenoy G V, Sharma S C - <i>Quantitative Techniques for Managerial Decisions</i> , New Age			
3. Kalavathy S - <i>Operations Research</i> , Vikash Publishing House (P) Ltd			
4. Viswanathan P K - <i>Business Statistics – An Applied Orientation</i> , Pearson			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -II						
CORE 10: ENVIRONMENTAL STUDIES						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 205	Environmental Studies					4
Preamble: This course aims at enable the leaners and facilitating to learn about various components of environment, ecosystem and their role in having a balanced environment for better and healthy life.						
Prerequisite: Basic knowledge on Social Science and Environment.						
Course Out Comes (COs): To make students aware about environmental issues so that they can act responsibly and make other people aware about resource conservation, prevention & control of pollution and disaster management.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To give idea about the multidisciplinary nature of environmental studies					
CO2	To understand the concept of ecosystem, biodiversity, and conservation strategies					
CO3	To understand causes, impacts and preventive measures of air pollution, water pollution, soil pollutionand noise pollution					
CO4	To understand human and social issues related to environment					
CO5	To understand duties and responsibilities in resource conservation, prevention & control of pollutionand disaster management					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Definition, scope and importance, need for public awareness	2	Black Board Teaching/ e-Pathshala

2	<p>Renewable and non-renewable resources: Natural resources and associated problems</p> <p>a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.</p> <p>b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflict over water, dams-benefits and problems.</p> <p>c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.</p> <p>d) Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.</p> <p>e) Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources. Case studies.</p> <p>f) Land resources: Land resource, land degradation, man induced landslides, soil erosion and desertification.</p> <ul style="list-style-type: none"> • Role of an individual in conservation of natural resources. <p>Equitable use of resources for sustainable lifestyles.</p>	8	Black Board Teaching/ e- Pathshala
3	<ul style="list-style-type: none"> • Concept of an ecosystem. • Structure and function of an ecosystem. • Producers, consumers and decomposers. • Energy flow in the ecosystem. • Ecological succession. • Food chains, food webs and ecological pyramids. • Introduction, types, characteristic features, structure and function of the following ecosystems: - <ol style="list-style-type: none"> Forest ecosystem Grassland ecosystem Desert ecosystem <p>Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)</p>	6	Black Board Teaching/ e- Pathshala
4	<ul style="list-style-type: none"> • Introduction–Definition: genetic, species and ecosystem diversity. • Biogeographical classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels. • India as a mega-diversity nation • Hot-spots of biodiversity. • Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. • Endangered and endemic species of India • Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. 	8	Black Board Teaching/ e- Pathshala
5	Definition, Cause, effects and control measures	8	Black Board

	of:- a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards • Solid waste Management: Causes, effects and control measures of urban and industrial wastes. • Role of an individual in prevention of pollution. • Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides.		Teaching/ e-Pathshala
6	<ul style="list-style-type: none"> • From Unsustainable to Sustainable development • Urban problems related to energy • Water conservation, rain water harvesting, watershed management • Resettlement and rehabilitation of people; its problems and concerns. Case Studies • Environmental ethics: Issues and possible solutions. • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. • Waste land reclamation. • Environment Protection Act. • Air (Prevention and Control of Pollution) Act. • Water (Prevention and control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act • Issues involved in enforcement of environmental legislation. • Public awareness. 	6	Black Board Teaching/ e-Pathshala
7	<ul style="list-style-type: none"> • Population growth, variation among nations. • Population explosion–Family Welfare Programme • Environment and human health. • Human Rights. • Value Education. • HIV/ AIDS. • Women and Child Welfare. • Role of Information Technology in Environment and human health. • Case Studies. 	6	
8	<ul style="list-style-type: none"> • Visit to a local area to document environmental assets • Visit to a local polluted site • Study of common plants, insects, birds. • Study of simple ecosystems-pond, river, hill slopes, etc. (Field work equal to 5 lecture hours)	5	
Total		49	

Reference Books:
1. Bharucha E. Textbook of Environmental Studies for Undergraduate Courses. UGC
2. Kaushik C.P. and Kaushik A. Perspectives of Environmental Studies, New Age International Publishers
3. De A.K. Environmental Chemistry, Wiley Eastern Ltd
4. Rajagopalan R. Environmental Studies from Crisis to Cure. Oxford University Press
Focus of Course: Employability
e-Content: Vidya-mitra/ e-Pathshala

SEMESTER -III						
CORE 11: ORGANIZATION BEHAVIOR						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 301	Organization Behavior					5
Preamble: This course aims at facilitating the students to learn about human behaviour at organisation at various stages and how human behaviour is influence by various factors of organisation.						
Prerequisite: Basic knowledge and idea of human behaviour and organizational structure.						
Course Out Comes (COs): This course aims to improve students understanding of human behavior in organization and the ability to lead people to achieve more effectively toward increased organizational performance						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To make students understand the basic concept of organization					
CO2	To familiarise students with the basic concept of Organizational Behaviour in general and how people must behave in the organization					
CO3	To give them the knowledge about Contributing discipline and fundamental concept of OB and also about Challenges and Opportunities for OB in today's world					
CO4	To explain students about the Attitude, Values, Perception and Personality which influence organizational behaviour					
CO5	Students get the idea about Motivation and its various theories from this paper. Also, about Leadership, functions of leader and its different styles, Leadership Theories					
CO6	To enable students to describe how people behave under different conditions and understand why people behave as they do.					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Introduction to OB, Contributing discipline of OB, Fundamental concept of OB. Challenges and Opportunities for OB. Attitude, Values, Personality	15	Black Board Teaching/ e-Pathshala
2	Perception- Concept and Definition. Process of Perception; Factors influencing perception; Perception and Individual decision-making, Shortcuts/ Barriers to Perceptual Accuracy	14	Black Board Teaching/ e-Pathshala
3	Motivation – Concept, Definition and Components of Motivation. Process of Motivation. Motivating employees in Work Place. Motivation Theories- Hierarchy of Needs Theory, Theory X & Theory Y and Herzberg's Two Factor Theory	15	Black Board Teaching/ e-Pathshala
4	Leadership – Concepts and Definition Functions of Leaders, Different styles of Leadership; Situation for determining choice of Leadership Style. Leadership Theories	16	Black Board Teaching/ e-Pathshala
5	Group – Concept and Definition of Group and Team Classification of Group and Stages of Group Formation; Importance/ Reasons for joining a Group. Group dynamics – Group decision making, Group structure	15	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Prasad L M, <i>Organisational Behaviour</i> , Sultan Chand			
2. Khanka S S, <i>Organisational Behaviour</i> , S Chand			
3. Robins S.P. And Decenzo D.A., <i>Fundamentals of Management</i> , Pearson education, NewDelhi, 5 th edition, 2009			
4. Luthans F, <i>Organisational Behaviour</i> , McGraw Hill Companies, 8th Edition, 1998			
5. Newstrom J W, <i>Organizational Behaviour</i> , Tata McGraw Hill Z Ltd, 12th Edition, 2009			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -III						
CORE 12: COST AND MANAGEMENT ACCOUNTING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 302	Cost And Management Accounting					5
Preamble: This course aims at facilitating the students to learn about various types of cost accounting and its implications on an economy as well as on an organisation and how controlling mechanism can be adopted.						
Prerequisite: Basic knowledge and idea on cost and expenditure and their implications on organisation.						
Course Out Comes (COs): This Paper aims at familiarizing the students with the application aspect of accounting and various techniques that are used to obtain accounting information that are used for decision making. The paper explains the concepts of management accounting and elucidates the methods of accounting and control while intends to help the future managers in understanding and utilizing the accounting information effectively						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Express the place and role of cost accounting in the modern economic environment					
CO2	Select the costs according to their impact on business					
CO3	Differentiate methods of schedule costs per unit of production					
CO4	Differentiate methods of calculating stock consumption					
CO5	Interpret the impact of the selected costs method					
CO6	Apply management accounting tools for cost allocation, budgetary control, Performanceevaluation, pricing and cost management					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Cost and expense, financial accounting and cost accounting, management accounting and cost accounting, evolution of and need for cost accounting. Classification of cost based on elements,function and behaviour, analysis of total cost – preparation of cost sheet. Basic Concepts & Terms: Cost centre and cost unit, profit centre and investment centre	15	Black Board Teaching/ e-Pathshala
2	Classification, Collection, allocation, apportionment and absorption of overheads; need for using estimated overhead rates, treatment of under and over absorption of overheads	12	Black Board Teaching/ e-Pathshala
3	Basic concepts; Cost-Volume-Profit analysis, differential costing and application of Marginal Costing in managerial decision making	14	Black Board Teaching/ e-Pathshala
4	Introduction, standard cost and standard costing; advantages and disadvantages, Establishment of standard costs – analysis of Variance – material, labour and overhead	16	Black Board Teaching/ e-Pathshala
5	Meaning, objectives, merits and limitations – Different Types of Budgets – Zero Based Budgeting	18	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Jain S P and Narang K L, <i>Cost Accounting</i> , Kalyani Publishers			
2. Banerjee, <i>Cost Accounting</i> , World Press			
3. Management Accounting – Principles and practice by R. K. Sharma & Shashi K.Gupta			
4. Elements of costing accounting by Maheshwari& Mittal			
5. Cost accounting –Theory and Problems by Maheshwari& Mittal			
6. Cost and management accounting by Saxena and Vashisht – text, problems & Solution			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -III						
CORE 13: BUSINESS LAW						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 303	Business Law					5
Preamble: This course aims at facilitating the students to learn about various acts in the form of controlling and regulating mechanism for smooth conduction of company and their business and economic activities.						
Prerequisite: Basic knowledge and idea on regulations in the form of acts.						
Course Out Comes (COs): To give the students orientation about different forms of organizations, functions in organizations, business strategies and environment, along with an exposure to elements of business laws and entrepreneurship.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Acquire knowledge on different mercantile laws					
CO2	Understand Sources and formation of laws					
CO3	Describe the process of legislation of law					
CO4	Able to relate to the day-to-day business activity					
CO5	Understand the legal and fiscal structure of different forms of business organizations and their responsibilities as an employer					
CO6	Acquire problem solving techniques and to be able to present coherent, concise legal arguments.					.

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Definition and characteristics, Formation of Company,	16	Black Board

	Memorandum and Articles of Association, Distinction between M.O.A. and A.O.A., Appointment of Directors, Powers, Duties and liabilities of directors-Meetings-Winding up of company.		Teaching/ e-Pathshala
2	Definition of Sale, Distinction between Sale and Agreement to sell, Definition: Conditions and warranties- Distinction between both-Doctrine of Caveat Emptor-Exception to the Rule-Unpaid Seller-Rights of Unpaid Seller	14	Black Board Teaching/ e-Pathshala
3	Definition of Contract-Essentials of a valid contract-Offer and Acceptance-Legal rules regarding offer-Consideration-“No consideration no contract “-Exception to the rule-Capacity of Parties-Consent-Quasi Contract-Breach of contract and remedies	12	Black Board Teaching/ e-Pathshala
4	Nature, characteristics and kinds of N/I-Comparison between Promissory Note and Bill of Exchange-Presentment- Dishonour of N/I	13	Black Board Teaching/ e-Pathshala
5	Introduction-Objects-Definition of consumer-Three tier consumer dispute Redressal Mechanism, composition and jurisdiction-Consumer rights	10	Black Board Teaching/ e-Pathshala
6	Cases will be discussed on relevant topics of above discussed topics	10	Case studies
Total		75	
Reference Books:			
1. N.D. Kapoor- Element of Mercantile Law- Sultan Chand (Main text)			
2. Legal Aspects of Business, Akhileshwar Pathak, 3 rd Edition, Tata McGraw Hill			
3. Avtar Sing, Company Law, Eastern, Lucknow			
4. Khergamwala, J.S., The Negotiable Instrument Acts, N.M.Tripathi, Bombay			
5. Ramaiyam, A. Guide to the Companies Act, Wadhwa, Nagpur			
6. Shah, S.M., Lectures on Company Law, N.M.Tripathi, Bombay			
7. Tulisian P.C. Business Law, TMH, N.Delhi			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -III						
CORE 14: ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 304	Entrepreneurship And Small Business Management					5
Preamble: This course aims at facilitating the students to learn about managing small business in professional manner and how entrepreneurship and entrepreneurial activities can be started as well as managed.						
Prerequisite: Basic knowledge and idea on small business and entrepreneurship.						
Course Out Comes (COs): The objective of this paper is to help students understand the importance of entrepreneurship, the need and significance of entrepreneurship development programs and the steps and procedures of preparing a business plan.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the need and significance of entrepreneurship, qualities of an entrepreneur					
CO2	Familiarize with the theories of entrepreneurship, entrepreneurial strategies and will be able to differentiate between entrepreneurs and manager					
CO3	Familiarize with government policies and procedures for setting up new enterprise and also how to scan the environment					
CO4	Understand Micro, Small and Medium Enterprises and how they operate					
CO5	Get familiarized with the sources of funds, the documents required for raising funds, factors of site selection etc.					
CO6	Would be able to prepare proper business plan by analysing the market and demand -supply analysis.					.

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content

I	Concept: Need and Significance of Entrepreneurship Development in Global contexts. Entrepreneurship Development – concepts, Process, Experience and strategies. Dynamics of Entrepreneurship Development. Entrepreneurship Quality / Motivation: The Entrepreneurship – Myths and Misconception, qualities, Characteristics and role demanded of an Entrepreneur, Process of Developing Entrepreneur Qualities	18	Black Board Teaching/ e-Pathshala/ Regional cases discussion
2	Enterprise Launching & Resources: Government Programmes, Policies, Incentive and Institutional Networking for Enterprise setting, Steps of setting new Enterprise, Scanning Business Environment, Sensing Business opportunity & Identifying Product	18	Black Board Teaching/ e-Pathshala
3	The Micro, Small and Medium Enterprises Development Act, 2006; Other Legal requirements; Raising of funds, Documents required. Site Selection, Factors of site selection, Sources of site, Advantage of Proper site selection	14	Black Board Teaching/ e-Pathshala
4	Business Plan Preparation – Procedure & Steps, Market Survey & Demand Analysis, Growth, Modernization & Expansion of Enterprise, Business environment of North East India	13	Black Board Teaching/ e-Pathshala
5	Case study will be carried out on various topics of this subject	10	Case Studies
Total		75	
Reference Books:			
1. Holy/Entrepreneurship: New Venture Creation, PHI			
2. Udayamita (in Hindi) by Dr. M.M.P. Akhouri & Dr. S.P. Mishra Published by National Institute of Entrepreneurship and small Business Development, NSIC-PTC Campus, Okhla			
3. Entrepreneurship Development by- Dr. S. Moharana & Dr. C.R. Das, Pub. By RBSA publishers, Jaipur			
4. Entrepreneurship Development by S.S. Khanna, published by S.Chand & Company Ltd., Ram Nagar, New Delhi			
5. Entrepreneurship development by C.B. Gupta & N.P. Srinivasan, Publisher – S. Chand & Sons 1992			
6. Entrepreneurship: A Contemporary Approach by Donald K.K. & Richard M. Hodgitis			
7. Entrepreneurship by David H. Holt, Prentice Hall of India			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -III						
CORE 15: MANAGEMENT INFORMATION SYSTEM						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 305	Management Information System					5
Preamble: This course aims at facilitating the students to learn and enhancing skill of data store management, understanding role of E-Commerce and its execution and associate security issues.						
Prerequisite: Basic knowledge and idea on e- commerce and electronic transaction.						
Course Out Comes (COs): To understand the role of information systems in today's competitive business environment and to assess the relationship between the digital firm, electronic commerce, electronic business and internet technology.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To understand the role of information systems in today's competitive business environment and assess the relationship between the digital firm, electronic commerce, electronic business and internet technology					
CO2	To understand about the different types of Management Information System, which are being used in different types of organization					
CO3	To know the overall process of an e-commerce website how they work, what are the payment methods					
CO4	Give complete knowledge about scope, nature, benefits and limitation of E-Commerce					
CO5	To understand the importance of Management Information System in each and every type of organization					
CO6	Provide knowledge about Electronics payments and protocols and other various systems.					.

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-

			Content
I	Information, types of information, dimensions of information, MIS concept, definition, nature and scope of MIS, MIS characteristics, MIS functions, MIS classification	12	Black Board Teaching/ e-Pathshala/
2	Finance, marketing, manufacturing and personnel, planning for, designing and implementing MIS, strategic and project planning for MIS, conceptual system design, detailed system design, implementation, evaluation and maintenance of MIS	18	Black Board Teaching/ e-Pathshala
3	Introduction, strategic roles for information system, breaking business barriers, value chain and strategic IS, re-engineering, business processes, improving business quality, the challenges of strategic IS, sustaining strategic success, intranets, extranets, enterprise collaboration system	18	Black Board Teaching/ e-Pathshala
4	Introduction, definition, scope, electronic marketing process, interdisciplinary nature of EC, future of EC, benefits and limitations, driving forces of electronic commerce, impact of EC, EC strategy and implementation, strategic planning for EC, electronic commerce strategy in action, competitive intelligence on the internet, implementation: plans and execution, project and strategy assessment, managerial issue	15	Black Board Teaching/ e-Pathshala
5	Electronic payments and protocols, security schemes in electronic payment systems, electronic credit card system on the internet, electronic fund transfer and debit cards on the internet, stored value cards and E-cash, electronic check systems, use of firewalls in E-Commerce security	12	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Management Information Systems (MIS), Jerome Kanter Prentice Hall of India (PHI)			
2. MIS, Laudon & Laudon, PHI			
3. MIS, James A. O'Brien, Galgotia Publications 4 th Edition			
4. MIS, D.P. Goyal, McMillan India			
5. Electronic Commerce, Efraim Turban, Jae Lee, David King, H. Michael Chung			
6. Information systems for Modern Management, Robert G Murdick, Joel E. Ross, James R Claggert, 3 rd Edition			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -IV						
CORE 16: FINANCIAL MANAGEMENT-I						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 401	Financial Management-I					5
Preamble: This course aims at facilitating the students to learn about functions of finance, techniques of Capital budgeting, sources of finance, cost of capital, working capital management and inventory management						
Prerequisite: Basic knowledge and idea on financial management.						
Course Out Comes (COs): This course is introduced to learn the basics and fundamental issues of Financial Managementand also to understand and apply financial concepts with methods of algebra.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	It helps the students to signify and evaluate the basic features of financial markets					
CO2	The students will be able to apply the net present value criterion to complex capitalbudgeting problems					
CO3	Helps in determining a firm's weighted average cost of capital					
CO4	Evaluates alternative techniques for analysing opportunities and budgeting capital					
CO5	Understanding the basics of the term structure of interest rates and the yield curve					
CO6	The students would understand various issues involved in financial management of a firmand hone their skills for making sound financial decisions and policies.					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content

I	Introduction; finance functions; goals of financial management; risk & return trade off; organisation of finance functions	12	Black Board Teaching/ e-Pathshala/
2	Nature of investment decisions; importance of investment decisions; investment evaluation criteria; capital budgeting techniques – NPV, IRR, Payback and accounting rate of return	15	Black Board Teaching/ e-Pathshala
3	Meaning and significance of the cost of capital; the concept of cost of capital; opportunity cost; component cost of capital: - debt, equity, preference capital, and retained earnings; weighted average cost of capital	18	Black Board Teaching/ e-Pathshala
4	Sources of finance; meaning of capital structure; factors influencing capital structure; theories of capital structure: - NI, NOI, MM, and traditional approaches venture capital	15	Black Board Teaching/ e-Pathshala
5	Concepts of working capital; need for working capital; determinants of working capital; computation of working capital; an elementary knowledge of components of working capitalmanagement: - cash management, receivables management and inventory management	15	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Van Horne/Financial Management & Policy, 12 th Edition, Prentice Hall of India			
2. Financial Management by I. M. Pandey (IMP) – Vikas Publishing house			
3. Financial Management – Theory & Practice by Prasanna Chandra (PC) – Tata McGrawHill			
4. Financial Management – Text and Problems by M. Y. Khan & P. K. Jain (KJ), TataMcGraw Hill Publishing Co. Ltd.			
5. Management Accounting – Principles and Practice – R. K. Sharma &Shashi K. Gupta –Kalyani Publishers			
6. Financial Management by P. V. Kulkarni & B. G. Sathyaprasad (PVK) – HimalayaPublishing House			
Focus of Course: Skill/ Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -IV						
CORE 17: INTERNATIONAL BUSINESS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 402	International Business					5
Preamble: This course aims at facilitating the students to learn about practice and importance of carried out the various international business for growth of an economy and how various international institutions and organizations control and provide facilities for international business to countries, will also know about foreign exchange market and their functions.						
Prerequisite: Basic knowledge and idea on Marketing activities and finance						
Course Out Comes (COs): This course will provide students with the knowledge, skills, and abilities to understand the global economic, political, cultural and social environment within which firms operate. It will examine the strategies and structures of international business and assess the special roles of an international business's various functions. It will also prepare students to formulate and execute strategies, plans, and tactics to succeed in international business ventures						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Learn to distinguish different market entry strategy in international markets					
CO2	Understand the different product development and adaptation requirement					
CO3	Understand the different aspects of international marketing environment with special focus on the international bodies					
CO4	Learn the basic export finance modes					
CO5	Obtain the general idea about export & import procedures & documentation					
CO6	Distinguish the advantages and disadvantages of products and services possess in international marketing in both emerging markets and mature markets.					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Nature, importance and scope; Modes of entry in to International Business; Frame work for analyzing international business environment; Economic, Technological, Socio-cultural, Political and legal environment; International Economic Environment-- International financial system; Institutional support to International Business-- UNO, IMF, World Bank; UNCTAD; WTO	14	Black Board Teaching/ e-Pathshala/
2	Different levels of integration between Countries, European Union, NAFTA, ASEAN, EFTA, SAARC, and SAPTA	16	Black Board Teaching/ e-Pathshala
3	MNCs, Host and Home Country relations, International Technology Transfers: Importance and types, Foreign Technology Acquisition	18	Black Board Teaching/ e-Pathshala
4	Determining exchange rates; Fixed and flexible exchange rate system; Participants in the Foreign exchange markets; Cash and Spot exchange market; Exchange rate quotes; Factors affecting exchange rates – spot rates, forward exchange rates, forward exchange contracts; Foreign exchange and currency futures; Exchange rate arrangement in India; Overview of FEMA; Exchange dealings and currency possession; Information and communication. Foreign Exchange Risk: Transaction exposure, transaction exposure and economic exposure	15	Black Board Teaching/ e-Pathshala
5	Capital flows – types and theories of foreign investment – Foreign investment flows and barriers. Recent Developments in International Business: Ecological issues; Social aspects	12	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. F. Cherunilum, International Business, PHI New Delhi			
2. K. Aswathappa, International Business, Tata McGrawHill, New Delhi			
3. F. Adhikary, Manab, Global Business Management, Macmillan, New Delhi			
4. Black and Sundaram: International Business Environment, PHI New Delhi. F. Buckley, Ardin: The Essence of International Money, PHI New Delhi.			
5. Bhattacharya, B: Going International Response Strategies for Indian Sector, Wheeler			
6. Gosh, Biswanath, Economic Environment of Business, South Asia Book, New Delhi			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -IV						
CORE 18: MANAGEMENT OF SERVICES						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 403	Management Of Services					5
Preamble: This course aims at facilitating the students to learn about various service sectors, consumers' behaviour towards service sectors, their marketing strategy and sustaining service quality.						
Prerequisite: Basic knowledge and idea on Marketing management and service sector.						
Course Out Comes (COs): The objective of this course is to supplement basic marketing and marketing strategy courses by focusing on problems and strategies specific to marketing of services						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Explain the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people					
CO2	Explain service blueprinting, the integration of new technologies, and other key issues facing today's customer service providers and service managers					
CO3	Understand Consumer Behaviour in Services, Customer Expectations and Perception of Service.					
CO4	Understand Service Quality and Productivity, Measures of Service Quality, SERVQUAL Scale.					
CO5	Understand Service Marketing Mix, Service Development and Design etc.					
CO6	Give complete knowledge on Customer Feedback and service recovery, Service Profit etc.					.

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-

			Content
I	Nature and Definition of Services, Trends in Services Marketing; Distinctive Characteristics of Services; Classification of Services, Services Marketing Mix, Service Marketing Triangle	12	Black Board Teaching/ e-Pathshala/
2	Consumer Behaviour in Services, Customer Expectations and Perception of Service, Customer Satisfaction, Marketing Research in Services, Segmentation, Targeting and Positioning Services, Understanding Customer/ Firm Relationships, Customer profitability Segments, Strategies for Building Loyalty.	18	Black Board Teaching/ e-Pathshala
3	The Service Marketing Mix-Service Development and Design, Communication Mix for services, Pricing of Services, Service Delivery through Intermediaries and Electronic Channels, People in Services, Designing and Managing Service Processes, Balancing Demand and Supply, Physical Evidence in Services.	18	Black Board Teaching/ e-Pathshala
4	Service Quality and Productivity, Measures of Service Quality, SERVQUAL Scale, Gap Model of Service Quality, Improving Service Quality, Strategies for Reducing the Gaps	16	Black Board Teaching/ e-Pathshala
5	Customer Feedback and Service Recovery, Service-Profit Chain, Service Leadership	11	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. Services Marketing by Valaerie Zeithaml and Mary Jo. Bitner. (Tata McGraw Hill)			
2. Services Marketing by Lovelock, Wirtz and Chatterjee. (Pearson Education)			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -IV						
CORE 19: ENTERPRISE RESOURCE PLANNING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 404	Enterprise Resource Planning					4
Preamble: This course aims at facilitating the students to learn about Material Requirement Planning, ERP and their applications.						
Prerequisite: Basic knowledge and idea on application and use of application software.						
Course Out Comes (COs): This paper will enhance the students by giving knowledge which is modern in terms of technology. That means the students will learn the different advanced methods of office work.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Impart knowledge regarding how a modern office operates					
CO2	Understand that due to advancement of scientific and technological devices how office works are performed today in comparison to old and conventional way earlier					
CO3	Understand that office work has been becoming sophisticated and there is no room to perform the same with leisurely attitude					
CO4	Understanding the need, benefits and role of ERP.					
CO5	Understand the role of ERP in manufacturing, Retail Sector and CRM					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	<ul style="list-style-type: none"> Introduction to MRP I Evolution of Material Requirement Planning Importance of MRP I 	12	Black Board Teaching/ e-Pathshala/

	<ul style="list-style-type: none"> • Factors affecting on materials planning 		
2	<ul style="list-style-type: none"> • Introduction to MRP II • Historical Perspective • Introduction to Bill of Material • Understanding the MRP loop 	13	Black Board Teaching/ e-Pathshala
3	<ul style="list-style-type: none"> • Defining ERP • Need for ERP system • Benefits of ERP • Role of ERP in manufacturing 	13	Black Board Teaching/ e-Pathshala
4	<ul style="list-style-type: none"> • Role of ERP in manufacturing • Role of ERP in Retail Sector • Application of ERP • Role of ERP in CRM 	14	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on above mentioned topics	8	Case study e books
Total		60	
Reference Books:			
1. Enterprise Resource Planning, Concepts and Practices: By Vinod kr. Garg and N. Kvenkitakrishnan			
2. Concepts in Enterprise Resource Planning: By L. L Monk and Brant Wagner			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -IV						
CORE 20: RESEARCH METHODS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 405	Research Methods					5
Preamble: This course aims at facilitating the students to learn about procedure and techniques of conducting projects, research and survey along with preparation of report by using various analysis tools and techniques of both qualitative and quantitative.						
Prerequisite: Basic knowledge and idea on project as well as survey.						
Course Out Comes (COs): The objective of this course is to develop the research skills of the students in investigating into the business problems with a view to arriving at objective findings and conclusions and interpreting the results of their investigation in the form of Systematic reports.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	It will enable the students to have a thorough understanding about technicalities that are involved in a research work					
CO2	Better understanding of general definition of research design					
CO3	Students would be able to ascertain the overall process of designing a research study from its commencement to the report					
CO4	Students will be familiarized with the various ethical concerns in educational research, including those issues that arise while using quantitative and qualitative research					
CO5	It will also enable the students to delineate the meaning of a variable, and to be able to identify independent, dependent, and mediating variables					
CO6	Students would be acquainted with the steps in the process of quantitative data collection					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus

Unit	Course Contents	Hours	e-Resources/ e-Content
I	Concept of Research, Significance of research in business, Nature and Scope of Research Methodology, Types of Research, Problem Formulation and Research Objectives, Research Process: Steps Involved in Research Process	14	Black Board Teaching/ e-Pathshala/
2	Nature of Research Design, Formulation of the Research Design, Classification: Exploratory, Descriptive and Experimental Research design	10	Black Board Teaching/ e-Pathshala
3	Population, Sample and Sampling, Methods of sampling: Probability and Non-probability sampling methods, Determination of Sample size	15	Black Board Teaching/ Assignment
4	Types of Data – Primary and secondary data; Methods of Data Collection- Observation, Interview, Schedule & Questionnaire method, Questionnaire Design	14	Black Board Teaching/ e-Pathshala/ Assign small project
5	Analysis of Data: Coding, Editing, and Tabulation of Data, Various kinds of Charts and Diagrams used in data Analysis, Techniques for data analysis, Field work and Processing of Survey data, Software packages of data analysis	8	Black Board Teaching/ e-Pathshala/ Assign small project/ Hands on training
Total		75	
Reference Books:			
1. anneerselvam R., Research Methodology, New Delhi, Prentice Hall of India, latest Ed			
2. Green Paul e., Tull Donald s., Albaum G., Research for marketing decisions, 5 th ed., New Delhi, Prentice Hall of India			
3. C.R. Kothari, Research Methodology: Methods and Techniques, 2009			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
CORE 21: FUNDAMENTALS OF PRODUCTION AND OPERATION						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 501	Fundamentals Of Production and Operation					5
Preamble: This course aims at facilitating the students to learn on consideration of various factors while designing layout, selection of location, quality management and inventory management for running a profitable manufacturing plant with minimum cost and waste.						
Prerequisite: Basic knowledge and idea on manufacturing plant and associated activities.						
Course Out Comes (COs): To familiar with the production and operation management concerning planning, design and management of production and quality control						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To know about the Facility location selection and also the different layouts of plants for different types of products					
CO2	To know about the Inventory management, inventory control models, Material management as well as purchasing management and what are the importance of these topics in an organization					
CO3	To understand the concept of production planning and production control and also the quality standards					
CO4	To know the concept of Inventory management as well as Materials Management					
CO5	Will be able to understand Production Planning, Quality Control and Quality Management					
CO6	Will understand the concept of ABC analysis as well as HML Analysis					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-

			Content
I	Nature of Production, Decision Making in Production, Importance of production Function, Production Management and Operations Management, Major Process Decision Make or Buy Decisions, Make or Buy Analysis	15	Black Board Teaching/ e-Pathshala/
2	Definition of Layout, Principles of Layout, Types of Layouts, Service Facility Layout, Layout Planning, Layout Tools and Techniques Layout or Building	18	Black Board Teaching/ e-Pathshala
3	Production Planning, Factors Determining production Planning Procedures, Production Planning System, Make or Buy Analysis, Quality Control, Types of Control Charts, Quality management, Definition of Quality Management	18	Black Board Teaching
4	Inventory – Meaning, definition and Objectives, Inventory control Techniques, ABC Analysis, HML Analysis, Just- In -Time systems (JIT)	17	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on relevant topics of this course	7	Cases studies
Total		75	
Reference Books:			
1. Aswathappa. K...; Bhat. K. S.: Production and Operations Management, Himalayan PublishingHouse, New Delhi (2012)			
2. Chary, S.N.: Production and Operations Management, TMHCL, New Delhi (2005)			
3. Sontakki, C. N: Production Management, Kalyani Publishers New Delhi (2010)			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
GENERAL ELECTIVE : RETAIL MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 502	Fundamentals Of Production and Operation					4
Preamble: This course aims at facilitating the students to learn on retailing, functions and strategies of retail operation and more importantly consumer behaviour towards retail sector.						
Prerequisite: Basic knowledge and idea on retailing.						
Course Out Comes (COs): To familiarize students with the decisions involved in running a retail firm and the concepts and principles for making those decisions. While the course focuses on the retail industry including retailers of consumer services, the content of the course is useful for students interested in working for companies that interface with retailers such as manufacturers of consumer products or for students with a general management or entrepreneurial interest						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	General understanding of the business of retailing					
CO2	Understand the different types of retail with their advantages and disadvantages					
CO3	Explain the factors relating to visual merchandising, such as store layouts and presentation					
CO4	Compare the strategies that are used within the different stages of a product's life cycle					
CO5	Describe the flow of goods and services in a retail environment (e.g., inventory control, supply chain, and risk management)					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Concept of retailing, Evolution of retailing, Functions	11	Black Board

	of retailing, Retail formats and types, Retailing Channels, Importance of retailing, Challenges faced by the retail sector, Retail Industry in India		Teaching/ e-Pathshala/
2	Market Segmentation and its benefits, Kinds of markets, Definition of Retail strategy, Strategy for effective market segmentation, Strategies for penetration of new markets	13	Black Board Teaching/ e-Pathshala
3	Store administration, Premises management, Inventory Management, Store Management, Receipt Management, Customer service, Retail Pricing, Factors influencing retail prices, Pricing strategies	15	Black Board Teaching
4	Retail consumer behavior, Factors influencing the Retail consumer, Customer decision making process, Types of decision making	13	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on relevant topics of this course	8	Cases studies
Total		60	
Reference Books:			
1. Retail Management by S.C. Bhatia, Atlantic Publisher and Distributor, New Delhi			
2. Retail Management by Michael Levy, Barton A Weitz and Ajay Pandit, TATA McGraw Hill Publishing Co Ltd, New Delhi			
3. Retail Management, Text and Cases, Swapna Pradhan, TATA McGraw Hill Publishing Co Ltd, New Delhi			
4. Retail Management by Suja Nair, Himalaya Publishing House, Mumbai			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
GENERAL ELECTIVE : KNOWLEDGE MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 502	Knowledge Management					4
Preamble: This course aims at facilitating the students to understand and know various unique practices in the form of knowledge and their maintenance for sustainable in competitive market.						
Prerequisite: Basic knowledge and idea on uniqueness practice in the form of knowledge.						
Course Out Comes (COs): The objective of the course is to provide the basics of the emerging area of Knowledge Management to students. This course through light on few important concepts as Knowledge management and Information Technology, Knowledge process, etc.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	The objective of the course is to provide the basics of the emerging area of Knowledge Management to students					
CO2	To give students general idea about Knowledge management and its definition. Also, about scope and significance of Knowledge Management					
CO3	To explain students about various Techniques and principles of Knowledge Management along with difficulties in Knowledge Management.					
CO4	To familiarize students with various terms and understanding about Organizational knowledge, characteristics and components of organizational knowledge –Building knowledge societies-Measures for meeting the challenges of implementing KM programmes					
CO5	This course through light on few important concepts as essential of Knowledge management as well as future knowledge management and industrial perspectives					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Introducing Knowledge Management, Need for	10	Black Board

	Knowledge Management, Valuation of Intellectual Capital, Intellectual Capital: Human vs. Structural Capital, Forces Driving Knowledge Management, Knowledge Management Systems, Issues in Knowledge Management		Teaching/ e-Pathshala/
2	What is Data, Information, What is Knowledge?, Data, Information, and Knowledge with Examples, Types of Knowledge, Subjective View of knowledge, Objective View of knowledge, Procedural vs. Declarative Knowledge, Tacit vs. Explicit Knowledge, General vs. Specific Knowledge, Technically vs. Contextually Specific Knowledge, Knowledge and Expertise, Types of Expertise, Types of Knowledge, Codifiability and Teachability of Knowledge, Specificity of Knowledge, Reservoirs of Knowledge, Characteristics of Knowledge	14	Black Board Teaching/ e-Pathshala
3	Knowledge Management Systems Life Cycle Challenges in KM Systems Development, Conventional Vs KM Systems Life Cycle (KMSLC), Key Differences, Key Similarities, KMSLC Approaches	10	Black Board Teaching
4	Artificial Intelligence and Understanding Knowledge: Cognitive Psychology, Data, Information and Knowledge, Kinds of Knowledge, Expert Knowledge, Thinking and Learning in Humans, Knowledge vs Intelligence, dumb search, Heuristic search in Knowledge-Based Systems, Knowledge Based Systems for KM, Knowledge Based Systems vs Expert Systems, Advantage and disadvantage of Knowledge Based Systems vs Expert Systems.	16	Black Board Teaching/ e-Pathshala
5	Knowledge Creation, Nonaka's Model of Knowledge Creation & Transformation, Knowledge Architecture, Acquiring the KM System	10	Cases studies
Total		60	
Reference Books:			
1. Web Warehousing & Knowledge Management, Mattison: Tata McGraw-Hill			
2. Knowledge management: An Evolutionary view, Becerra Fernandez: PHI			
3. Knowledge Management, Fernando: Pearson			
4. Knowledge Management, B.Rathan Reddy: Himalaya			
5. Knowledge Management, Tapan K Panda: Excel			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
GENERAL ELECTIVE : STOCK MARKET OPERATIONS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 502	Stock Market Operations					4
Preamble: This course aims at facilitating the students to understand about Stock market, types of shares and mechanism of their trading, various regulations and functions of stock market.						
Prerequisite: Basic knowledge and idea on stock market and share market.						
Course Out Comes (COs): The objective of the course is to make familiarise with stock market and its operations.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Students will understand the characteristics of different financial assets such as money market instruments, bonds, and stocks, and how to buy and sell these assets in financial markets					
CO2	Students will understand the benefit of diversification of holding a portfolio of assets, and the importance played by the market portfolio					
CO3	Student should able to make an informed judgement about whether or to what extent a financial market satisfies the conditions of an efficient market					
CO4	To understand the slot the equity market occupies in the financial system					
CO5	Students will know how to apply different valuation models to evaluate fixed income securities, stocks, and how to use different derivative securities to manage their investment risks. CO6 It will provide knowledge about existence of equity derivative instruments and its buying- selling operation					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-

			Content
I	Overview of Securities Market: Organizational structure of Financial System, Functions of Securities Market, Securities Market and Economic Growth, profile of Indian Securities Market, Market Regulation: SEBI Act, 1992 – Securities and contracts regulation Act 1956, Depositories Act, 1996, Reforms to Promote Investor Confidence, Role of IOSCO.	12	Black Board Teaching/ e-Pathshala/
2	Securities Market Intermediaries: Role of Securities Market Intermediaries, Merchant Bankers, Registrars and Share Transfer Agents, Underwriters, Banker to Issue, Debenture Trustees, Portfolio Managers, Syndicate members, Foreign Institutional Investors, Custodians, Stock Broker & Sub Broker, Investment Adviser.	13	Black Board Teaching/ e-Pathshala
3	Secondary Market Infrastructure & Institutions: Listing & Delisting of Securities, Stock Exchange Trading Mechanism at Bombay Stock Exchange & National Stock Exchange, straight through processing, Direct Market Access, Algorithmic Trading, Demutualization of Stock Exchange, SME Exchange, share price indices, Compiling Index Numbers and Interpretation	14	Black Board Teaching
4	Derivatives Trading, Meaning, Concept and Importance of Forward, Futures and Options – Rating Instrument, Credit Rating Agencies in India, New Financial Instruments, Depository Receipts, ADR, GDR, Indian Depository Receipts, Depository, Depository Participants, Insider Trading, Legal Framework for Investor Protection in India.	12	Black Board Teaching/ e-Pathshala
5	B.S.E. N.S.E : organizational structure, index construction, sensex, NIFTY, settlement, rolling settlement, pay in and pay out, no delivery period, auction of shares, investor protection fund	9	Black Board Teaching/ e-Pathshala/ Video clip
Total		60	
Reference Books:			
1.			
2.			
3.			
4.			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
DISCIPLINE CENTRIC SPECIALISATION: ADVERTISING AND SALES PROMOTION						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 503A	Advertising And Sales Promotion					5
Preamble: This course aims at facilitating the students to understand about role and importance of advertisement in promoting brand, product and organisation.						
Prerequisite: Basic knowledge and idea on advertisement.						
Course Out Comes (COs): The objective of the course is to develop an understanding of services and service marketing with emphasis on various aspects of service marketing which make it different from goods marketing						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Analyze the expanding environment of media and communication techniques					
CO2	Assess the strengths, weaknesses, opportunities and threats (SWOT) of different kinds of promotional campaigns.					
CO3	Develop creative strategies for advertising					
CO4	Assess strategic uses of sales promotions					
CO5	Plan media strategy, scheduling, and vehicle selection					
CO6	Assess strategic uses of sales promotions					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Advertising- Definition, Importance, Functions, Types, Role of advertising in promotion mix, Advertising & Marketing, communication system,	16	Black Board Teaching/ e-

	Integrated Marketing Communication, Advertising Budget (affordable method, Per unit method, percentage method, competitive parity, task-objective method), Role of Agency and Account Management		Pathshala/
2	Setting advertising goals (DAGMAR, AIDA, Hierarchy of Effects), Media Selection, Types of Media-merits & demerits, Message Design, Advertisement Appeals, Development of advertisement copy, Advertising & Internet, Mobile and related platforms	15	Black Board Teaching/ e-Pathshala
3	Nature and importance of sales promotion, its role in marketing, Forms of sales promotions- Consumer oriented sales promotion; trade-oriented sales promotion & Sales force-oriented sales promotion	18	Black Board Teaching
4	Major tools of sales promotion- samples point of purchase, displays & demonstrations, exhibitions & fashion shows, sales contests & games of chance and skill, lotteries gifts offer, premium and free goods, price packs, rebates patronage rewards, Conventions, conference & trade shows, specialties and novelties, developing sales promotion programme, pre-testing implementing, evaluation of results and making necessary modifications.	18	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on above discussed topics	8	Case studies
Total		75	
Reference Books:			
1. Foundations of Advertising Theory & Practice- S.A. Chunawalla & K.C. Sethia-Himalya Publishing			
2. Advertising and Promotions-Belch & Belch, Tata McGraw Hill			
3. Sales Management – Richard R. Still Edward W			
Focus of Course: Skill/Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
DISCIPLINE CENTRIC SPECIALISATION: RURAL MARKETING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 504A	Rural Marketing					4
Preamble: This course aims at facilitating the students to understand about necessity and importance of commercialization of various livelihood products and also focus on other allied necessary functions like distribution channel, adoption of marketing strategy provided quality assurance.						
Prerequisite: Basic knowledge and idea on Marketing Management						
Course Out Comes (COs): The objective is to create awareness about the applicability of the concepts, techniques and processes of marketing in rural context and to familiarize with the special problems related to sales in rural markets. It also helps to understand the working of rural marketing institutions						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the rural markets and the contemporary issues in rural marketing					
CO2	Understand rural market distribution					
CO3	Aware about consumer behavior and trends in rural marketing					
CO4	Understand the concept and methodology for conducting the research in rural market					
CO5	Identify the challenges and opportunities in the field of rural marketing for the budding managers and also expose the students to the rural market environment and the emerging challenges in the globalization of the economies					
CO6	Apply adaptations to the rural marketing mix (4 A's) to meet the needs of rural consumers					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content

I	Characteristics and Dimensions of Rural Markets – Importance of rural market- Rural MarketProfile - Rural Market in India - Size and Scope - Environment and Emerging Profile of Rural Markets in India - Constraints in Rural Marketing and strategy to overcome the constraints	11	Black Board Teaching/ e-Pathshala/
2	Rural Market Segmentation - Basis and Strategies – Targeting- Consumer Behavior in Rural Markets - Approach to Rural Markets of India – Marketing Mix for Rural Marketing - Product Planning for Rural Products - Pricing Methods and Strategies for Products of Rural Markets Product Management in Rural Markets - Thomson rule of Market Index, Lin-Quest and MICA Rating-Marketing Research	14	Black Board Teaching/ e-Pathshala
3	Agricultural inputs and their types-Government effects-challenges- Agricultural marketing- Different Agricultural Marketing Agencies and Institutions-Agribusiness scenario in North East	13	Black Board Teaching
4	Channels of Distribution: Distribution pattern and methods in rural markets - Special characteristics of rural channels - Channel management in rural markets - Managing physical distribution in rural markets - Storage, warehousing and transportation, Advertising and sales promotion for rural markets - Major challenges in Media planning - Sales force management in rural markets - Selecting the Media Mix - Evaluation of promotional activities	16	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on above discussed topics	7	Case studies
Total		60	
Reference Books:			
1. Singh, A.K. and Pandey, S- Rural Marketing: Indian Perspective (New AgeInternational Publisher Limited)			
2. Prag P A- Rural Diversification (EG Books)			
3. Warren M- Financial Management for Farmers and Rural Managers (BlackwellPublishing)			
4. Thorner Daniel and Morner Alice- Land and Labour in India (Asia Publishing House)			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
DISCIPLINE CENTRIC SPECIALISATION: MANPOWER PLANNING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 503B	Manpower Planning					5
Preamble: This course aims at facilitating the students to understand how important to get right number of candidates at right time and for that what are the activities have to perform by the organisation before the recruitment and selection process and consideration of factors for job evaluation and emerging trends of these.						
Prerequisite: Basic knowledge and idea on Human resource functions.						
Course Out Comes (COs): Objective of this paper is to acquaint the students with the concept of Man power planning, Human resource accounting, forecasting techniques and its application in practical world.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To acquaint students with the basic concept of Man power planning along with its need, importance, benefits etc. Also explain them the responsibilities of HR Department in Human Resource Planning function					
CO2	To give them the knowledge about various Human resource policies usually adopted in organizations and give them basic ideas about Job Analysis and Job Evaluation along with- how they are related with man power planning.					
CO3	To make students aware of various strategies regarding man power planning; and methods and Tools for Strategic Human Resource Planning					
CO4	To discuss about various functions related with HRP like Recruitment, Selection, Induction, Career Planning, Succession etc.					
CO5	Also explain about Emerging Trends related to Knowledge management, Innovativeness and Talent Management in HRP					
CO6	The outcome of this paper is to give students a very good idea about various concept related to Man power planning and its application in today's competitive environment with the help of few case studies.					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															

CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Human Resource Planning: Meaning, Objectives and Importance of Human Resource Planning. Responsibilities of HR Department in Human Resource Planning function	15	Black Board Teaching/ e-Pathshala/
2	Meaning, Definition and Objectives of Human Resource Policies; Role of HR Policies in Human Resource Planning, Job Analysis: Meaning, Definition and its relation with HRP. Job Description and Job Specification: Meaning, Objectives. Job Evaluation: Meaning, Objectives and Different methods of Job Evaluation	18	Black Board Teaching/ e-Pathshala
3	Process and Time Scale of Human Resource Planning, Different methods and techniques used in Demand and Supply forecasting of HRP. Strategic Human Resource Planning: meaning, Definition, Benefits, methods and Tools for Strategic Human Resource Planning	19	Black Board Teaching
4	Recruitment: Meaning, Objectives and Sources. Selection: Meaning, Objectives and Process of Selection. Induction: Meaning and Objectives. Career Planning and Succession Planning: Meaning and Objectives. Emerging Trends: Knowledge management, Innovativeness and Talent Management in HRP	18	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on above discussed topics	5	Case studies
Total		75	

Reference Books:

1. Bhattacharyya D. K.: Human Resource Planning, Exel Publication, 2 nd edition
2. Dessler. G., Human Resource Management, Pearson Education Inc, U.S.A., 10 th edition, 2005
3. Robins S.P. and Decenzo D.A.: Fundamentals of Management, Pearson education, NewDelhi, 5 th edition, 2009.
4. V.S.P., Managing people, Excel books, New Delhi, 1 st edition, 2004.
5. Subba Rao, Human Resource Management, Excel Books, New Delhi 3 rd edition. 2009
6. Hillier F.S., Introduction to Management Science, Tata McGraw Hill, New Delhi, 2 nd edition, 2006
7. Fitz-Rnz J., How to measure Human Resource Management, , Himalaya Publications, New Delhi, 1 st edition, 2007
8. Nair S.R., Management, Himalaya Publications, New Delhi, 1 st edition, 2010
9. Rao V.S.P. and Krishna V.H., Management, Excel books, New Delhi, 1 st edition, 2002

Focus of Course: Employability
e-Content: Vidya-mitra/ e-Pathshala

SEMESTER -V						
DISCIPLINE CENTRIC SPECIALISATION: COMPENSATION BENEFITS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 504B	Compensation Benefits					4
Preamble: This course aims at facilitating the students to understand various components and their consideration while designing salary structure of organisation keeping focus on retaining and procuring best talent in organisation.						
Prerequisite: Basic knowledge and idea on Wage and Salary.						
Course Out Comes (COs): To understand the various dimensions of Compensation Management and to familiarize the role of various bodies involved in Compensation Management						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	It discusses the Basic structure of compensation and its relation with employees' productivity					
CO2	It helps in knowing the administration pattern and mechanism of employees' compensation and other benefits					
CO3	It discusses the motivational components of compensation like incentives, ESOP					
CO4	It discusses the different structure and components of Executive compensation which helps in giving a structure to organisation compensation					
CO5	To learn some of the implications for strategic compensation and possible employer approaches to managing legally required benefits					
CO6	It discusses the different structure and components of Executive compensation which helps in giving a structure to organisation compensation					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Compensation: Meaning, Definition, Types and Components of Compensation. Objectives and Significance of Employee's Compensation. Relationship between Employee's Compensation and Employee's Productivity	10	Black Board Teaching/ e-Pathshala/
2	Different benefits of Compensation system. Individual Bonus schemes, Retirement benefits, Fringe benefits, Preparation of and Basic Calculation of Salary or Wage of employee, Impact of Inflation in Salary	13	Black Board Teaching/ e-Pathshala
3	Incentives: Meaning, Objectives and significance of Incentives. Organization wide incentive plans- Profit sharing, stock options, Employee stock ownership plans. Individual and Group Incentive Plans.	15	Black Board Teaching
4	Components of executive compensation, Executive compensation theories, Relationship between Fixed and Variable pay, Performance measurement in executive compensation, Different criteria of executive compensation	14	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on above discussed topics	8	Case studies
Total		60	
Reference Books:			
1. Dipak Kumar Bhattacharya (2009), Compensation Management, First Edition, India, Oxford Publications			
2. Dr.Kanchan Bhatia, "Compensation Management", 2009, Himalaya Publishing House			
3. Tapomoy Deb, "Compensation Management", 2009, Excel Books, New Delhi.			
4. Belchor, David W. " <i>Compensation Administration</i> ", Prentice Hall, Englewood Cliffs. NT.			
5. Henderson, R.I. <i>Compensation Management in a Knowledge Based World</i> . New Delhi: Pearson Education			
6. Srivastava, S.C., <i>Industrial Relations & Labour Laws</i> , Vikas Publishing House (P) Ltd			
7. Singh. B. D: <i>Labour Laws for Managers</i> , Exel Books, IST, New Delhi, 2009			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V						
DISCIPLINE CENTRIC SPECIALISATION: INDIAN FINANCIAL SYSTEM						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 503C	Indian Financial System					5
Preamble: This course aims at facilitating the students to understand about Indian financial system, Role of Reserve bank and its Monetary policy, Money market and Capital market.						
Prerequisite: Basic knowledge and idea on Financial Management.						
Course Out Comes (COs): Financial system of a country is closely related to the economic development. There is drastic change in the functioning of financial system in this era of liberalization, privatization and globalisation. The purpose of including Indian Financial system as a subject is to give a clear understanding and knowledge of financial system in the present scenario						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Demonstrate knowledge and understanding of the Indian Financial System					
CO2	Develop an understanding of the meaning and characteristics of money market					
CO3	Gain knowledge of the primary market and the secondary market					
CO4	Comprehend and categories the relevance of various banking institutions					
CO5	Develop communication and presentation skills for analysis of IFS					
CO6	Student will be able to understand about the financial intermediaries in India					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Definition and Meaning of the Financial System - Components of the financial System: Institutions,	13	Black Board Teaching/ e-

	Instruments, Markets, and Services; Functions and Role of financial system; Financial System and Economic Development - Indicators of Financial Development: FR, FIR,NIR and IR		Pathshala/
2	Financial Sector Reforms: Narasimhan Committee Report 1991 and 1998 - Monetary Policy of the RBI: Recent Developments in the Monetary Policy - Monetary Policy Targeting - Transmission Channels of Monetary policy: Interest rate channel, exchange rate channel, asset price channel	15	Black Board Teaching/ e-Pathshala
3	Commercial Banking: Developments in Commercial banking sector since 1991s –Management of Non-Performing Assets (NPAs); Capital Adequacy Norms, Overview of Development Banking and Non-Bank Finance Companies (NBFCs) in India	16	Black Board Teaching
4	Financial services – Importance of financial services, Insurance, Mutual Funds, Lease Finance, Merchant Banking and Credit Rating, Micro Finance and Self-Help Group, Financial Inclusion Programme in India	16	Black Board Teaching/ e-Pathshala
5	Money Market: Structure of Indian Money Market, Recent Development in Indian Money Market, Capital Market: Structure of the Indian Capital Market – Recent Developments in the Indian Capital Market - Interlink between Money Market and Capital Market - Overview of Debt Market in India. Traditional Instruments: Equities, Debentures and Bonds; Hybrid Instruments; Different types of Bonds such as Floating Rate Bonds, zero interest bonds, Deep Discount bonds, Inverse float bonds	15	Case studies
Total		75	
Reference Books:			
1. Pathak Bharati (2008): The Indian Financial System –Markets, Institutions, and Services,(2nd Edition), Pearson Education, New Delhi			
2. Bhole L. M. (2008): Financial Institutions and Markets, Growth and Innovation, Tata McGraw-Hill, New Delhi			
3. Khan, M.Y. (2007): Financial Services, Tata McGraw Hill, New Delhi.			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -V DISCIPLINE CENTRIC SPECIALISATION: FINANCIAL MANAGEMENT – II (CORPORATE FINANCE)						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 504C	Financial Management – II (Corporate Finance)					4
Preamble: This course aims at facilitating the students to understand about financial markets, sources of corporate finance, Ratio analysis and corporate Investment.						
Prerequisite: Basic knowledge and idea on Financial Management.						
Course Out Comes (COs): Provide an in-depth view of the process in financial management of the firm and develop knowledge on the allocation, management and funding of financial resources. It will also help in improving students’ understanding of the time value of money concept and the role of a financial manager in the current competitive business scenario						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	The students would be able to develop knowledge about the various sources of finance for a corporate organisation					
CO2	It would enable the students to understand the various uses for finance in a corporate organization					
CO3	It would enable the students in familiarizing with the financial environment of business and financial markets					
CO4	It would enable the students in developing skills for analysis and interpretation business information					
CO5	Will be able to apply financial theory in financing related decisions by using various tools and techniques of financial management					
CO6	It would enable in developing skills for various techniques applied for appraisal of capital expenditure decisions in corporate investment decisions as well as working capital management					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus

Unit	Course Contents	Hours	e-Resources/ e-Content
I	Capital Markets, Primary Market, Basics of capital market mechanism, instruments, financing and rating institutions, and legal environment related to this. Secondary Market, Basics of stock exchanges and their role, regulatory framework, and transactions on stock exchange, Money Markets: Basics of money market mechanism, instruments, institutions, and legal environment related to this.	13	Black Board Teaching/ e-Pathshala/
2	Liquidity ratios, profitability ratios, turnover ratios, structural ratios etc. Comparative balance sheet, Common size statement analysis, Trend analysis, Sickness prediction	10	Black Board Teaching/ e-Pathshala
3	Calculating Cost of Capital, Calculating Cost of Specific Funds, Calculating Weighted Average Cost of Capital	11	Black Board Teaching
4	Introduction, Cash Flow Projection, Evaluation Techniques, Evaluation of Lease Contracts, Corporate Restructuring, Mergers and Acquisitions Types of Mergers Evaluation of Merger Proposal, Take-over, Amalgamation, Leverage buy-out, Management buy-out	13	Black Board Teaching/ e-Pathshala
5	Types of securities, Issuing the capital in market, Pricing of issue, Valuation of Stocks and bonds, Dividend policy and issue of bonus shares. Capital Structure Decision, Modigliani-Miller proposition I and II, Capital structure theories, Interface with cost of capital	13	Black Board Teaching/ e-Pathshala
Total		60	
Reference Books:			
1. Brealey R.A., Myers S.C. Principles of Corporate Finance. 6th edition. McGraw Hill. 2000			
2. Ross S., R.Westerfield, J.Jaffe. Corporate Finance. Fifth Edition. IRWIN-McGraw-Hill.			
3. Copeland T. and Weston J.: Financial Theory and Corporate Policy. 1998.			
4. Damodaran A. Applied Corporate Finance. Wiley&Sons. 1999			
5. Trigeorgis L. Real options. Managerial Flexibility and Strategy in Resource Allocation. The MIT Press. Cambridge. 1999			
6. Copeland T., Antikarov V. Real Options: a Practitioner's Guide. Texere. New York. London. 2001			
7. Reilly K.F., Brown K.C. Investment Analysis and Portfolio Management. 6 th Edition. The Dryden Press			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
CORE : STRATEGIC TECHNOLOGY MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 601	Strategic Technology Management					5
Preamble: This course aims at facilitating the students to understand about managing technology which are associated with data store, product, information and acquisition and transfer of technology for						
Prerequisite: Basic knowledge and idea on technology that generally organisation implements.						
Course Out Comes (COs): Technology has always been intertwined with society's progress but never before, in history, has technology been so visibly linked to improvements in standards of living. The great disruptions have been created by technology in the realm of business. Hence this paper seeks to impart insight into the aspects of technology management in today's business environment and with it, also touch upon issues related to management of intellectual property rights.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Identifying and evaluating the impact of relevant changing technology and managing those changes and also to get along with the new technology in the market.					
CO2	Technology-enhanced approaches for such organizations where Technology is the main competitive advantage in their sectors					
CO3	Role of technology in firm's competency as well as to do the competitive assessment for one organization's competitors					
CO4	To know how to manage the market changes and to cope up with the changes and to do innovation.					
CO5	Critically assess and explain key current issues in our understanding of innovation as a field of study					
CO6	To study about the Technology Road mapping i.e., how to plan for the future for different types of organization					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Technology & Economic Goals, Technology Strategy and Core Competence, Technology Strategy Framework	18	Black Board Teaching/ e-Pathshala/ Video clip
2	Forecasting Market Conditions, Forecasting Technological Change, Technology Life Cycle, Managing Innovations within Product Development Cycle	19	Black Board Teaching/ e-Pathshala
3	Evolution of Business and Business Process Re-engineering, Characteristics & Implications of Re-engineered Process, Role of Information Technology, Creativity and Human Resources in Reengineering	15	Black Board Teaching
4	Research Strategy, Implementing Technology in Products & Services, Technology Implementation in Production & Operations, Acquiring new technology	17	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on discussed topics.	6	Case Studies from internet
Total		75	
Reference Books:			
1. Strategic Technology Management by: Fredrick Betz, McGraw Hill Inc., New York, 1994			
2. Reengineering the Corporation – A manifesto for business revolution – Michael Hammer and James Champy, Nicholas Brealey Publishing, London, 1993			
3. Management of Technology by: Terek M. Khalil, McGraw Hill, Boston, 2000			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
GENERAL ELECTIVE : MARKET RESEARCH						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 602	Market Research					4
Preamble: This course aims at facilitating the students to enhance their knowledge and skill on conduction of research that can be contribute constructive output for further implementation.						
Prerequisite: Basic knowledge and idea on Research methodology.						
Course Out Comes (COs): This will provide students with an in depth understanding of market research. Students will be involved in a practical application of market research via a group project which will focus on a real company situation. Students will write a research brief, determine the research methodology and conduct interviews and surveys as required						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the importance and requirement of market research					
CO2	Conduct the market research and develop a business report.					
CO3	Familiar with the different aspects of marketing where research is required					
CO4	Overview of Quantitative Decision-Making tools and technique.					
CO5	Communicate research results in written report and oral presentation format					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Introduction, Meaning of Research, Research Characteristics, Various Types of Research, Marketing Research and its Management, Nature and Scope of Marketing Research, Marketing Research in	10	Black Board Teaching/ e-Pathshala/ Video clip

	the 21st Century (Indian Scenario), Marketing Research: Value and Cost of Information.		
2	Introduction, Research Process: An Overview, Formulation of a Problem, Research Methods, Research Design, Components of Research Paper	13	Black Board Teaching/ e-Pathshala
3	Introduction, Meaning of Research Design, Types of Research Design, Descriptive Research, Causal Research Design, Research Design and Marketing Decision Process	12	Black Board Teaching
4	Sources of data collection and methods; designing questionnaire; measurement of scales, sampling; hypothesis testing; Data Processing and Preliminary Data Analysis	13	Black Board Teaching/ e-Pathshala
5	Applications of Marketing Research; Introduction, Consumer Market Research, Business-to- Business Market Research, Product Research, Pricing Research, Motivational Research, Distribution Research.	12	Black Board Teaching/ e-Pathshala Case Studies
Total		60	
Reference Books:			
1. Marketing Research, Malhotra Dash, Pearson			
2. Research for Marketing Decisions Paul E. Green, Donald S. Tull			
3. Marketing Research- Text and Cases Harper W. Boyd Jr., Ralph Westfall			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
GENERAL ELECTIVE : HUMAN RESOURCE INFORMATION SYSTEM						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 602	Human Resource Information System					4
Preamble: This course aims at facilitating the students to enhance their knowledge and understanding on use of IT more and effectively specially in HR field for effective utilization of manpower and data of organisation.						
Prerequisite: Basic knowledge and idea on use of software and its benefits in HRM field in organisation.						
Course Out Comes (COs): To understand the concept of Human Resource Information Systems and to familiarize the applications of HRIS in Organizations						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	This paper is completely a practical paper to give students the practical knowledge about many Human Resource Functions essential to carry out in an organization					
CO2	To give students the practical knowledge about data management of HRIS.					
CO3	Give students the understanding about HRIS Process especially on HRIS recruitment, selection and performance appraisal etc.					
CO4	To provide understanding related to HRIS - Organization Structure & Related Management Processes.					
CO5	The expected outcomes of this paper are like tracking personnel-related HR functions-asfor example- employee database, staff planning, recruitment, development, attendance, payroll maintenance etc.					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Data & Information needs for HR Manager – Sources of	10	Black Board

	Data – Role of IT in HRM – IT for HR Managers – Concept, Structure, & Mechanisms of HRIS – Programming Dimensions & HR Manager EHRM – Objectives – Advantages & Disadvantages		Teaching/ e-Pathshala/ Video clip
2	Data Management for HRIS - Data Formats - Entry Procedure & Process - Data Storage & Retrieval - Transaction Processing - Office Automation - Information Processing & Control Functions - Design of HRIS - Relevance of Decision-Making Concepts for Information System Design - HRM Needs Analysis – Concept & Mechanisms - Standard Software and Customized Software - HRIS : An Investment	13	Black Board Teaching/ e-Pathshala
3	HR Management Process & HRIS - Modules on HR Planning, Recruitment, Selection, Placement - Module on Performance Appraisal System - Training & Development Module - Module on Pay & other Related Dimensions - Information System's support for Planning & Control	12	Black Board Teaching
4	HR Management Process II & HRIS - Organization Structure & Related Management Processes - Authority & Responsibility Flows - Communication Process - Organization Culture and Power – Data Capturing for Monitoring & Review - Behavioral Patterns of HR - Other Managers and their Place in Information Processing for Decision Making	14	Black Board Teaching/ e-Pathshala
5	Security, Size & Style of Organizations & HRIS - Security of Data and Operations of HRIS Modules - Common Problems during IT Adoption Efforts and Processes to Overcome - Orientation & Training Modules for HR & other Functionaries – Detailed Analytical Framework - Opportunities for combination of HRM & ITES Personnel - HRIS & Employee Legislation - An Integrated View of HRIS	11	Black Board Teaching/ e-Pathshala Case Studies
Total		75	
Reference Books:			
1. Michael Armstrong, A Handbook of Human Resource Management Practice, Kogan Page			
2. Gueutal & Stone, The Brave New World of Her, Jossey-Bass			
3. Monk & Wagner, Concepts in Enterprise Resource Planning, Thomson			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
GENERAL ELECTIVE : MUTUAL FUND						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 602	Mutual Fund					4
Preamble: This course aims at facilitating the students to enhance their knowledge on various investment schemes of financial institutions and their operations along with their technicality.						
Prerequisite: Basic knowledge and idea on various types of investments and their process of operation.						
Course Out Comes (COs): Objective of this paper is to make the students understand the basic concepts of mutual funds, the types and working of the mutual funds industry. It also makes the students aware of the pricing, selling and investment management techniques and business ethics in mutual funds						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To acquaint with core banking services with use of ICT					
CO2	It will horn the skills of students to enter into the industry with ready knowledge					
CO3	Skill development for Mutual fund scheme selection					
CO4	It will enable students to interpret mutual fund fact sheet					
CO5	Give knowledge about taxation on different types of MF schemes and Tracking Mutual funds real performance					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Mutual fund and its functions, Investment objectives of different kinds of mutual fund products Concept of Marking to Market. Concept of unit Capital, Assets under Management, Fund Running Expenses and Net Asset Value Advantages and limitations of mutual fund Concept of closed end funds, open	12	Black Board Teaching/ e-Pathshala/ Video clip

	ended funds and interval funds Concept of actively managed funds and passive funds Categorization of mutual fund schemes Developments in the Mutual Fund Industry over the years.		
2	Structure of mutual funds in India, Role of the Sponsor, Trustee and Asset Management Company (AMC) Regulatory provisions with respect to Sponsor, Trustee and AMC, Role and Functions of Service Providers of mutual funds, Payment Aggregators	10	Black Board Teaching/ e-Pathshala
3	Role of SEBI in regulating mutual funds. Concept of a Self-Regulator. Functions of AMFI. AMFI Code of Ethics (ACE) and AMFI Guidelines and Norms for Intermediaries (AGNI). Due Diligence process for its distributors. Rights and obligations of investors in a mutual fund	11	Black Board Teaching
4	Traditional distribution channels. Alternate Distribution channels of mutual funds. Pre-requisites to be fulfilled to become a distributor of a mutual fund. Commissions and Transaction Charges for mutual fund distributor. Regulatory requirements governing payment of commissions to distributors. Initial or Upfront and Trail Commissions. SEBI Advertising Code for Mutual Funds	13	Black Board Teaching/ e-Pathshala
5	Net assets of a mutual fund scheme and NAV. Mark to Market as a valuation metric. Total Expenses of Mutual Funds. Accounting and reporting requirements applicable to mutual funds. Valuation process Tax provisions applicable to a mutual fund. Risk, return and performance of funds: Performance of equity funds. Performance of debt funds, gold funds and real estate Kinds of returns, such as simple, annualized and compounded returns. SEBI norms regarding return representation of mutual funds in India. Risk in an equity fund, debt fund and other funds (hybrid, gold and real estate).	14	Black Board Teaching/ e-Pathshala
Total		60	
Reference Books:			
1. Indian Mutual Funds Handbook by Mr. Sundar Sankaran			
2. Systematic Investment Planning-SIP by CNBC TV 18			
3. How To Make A Fortune Through Mutual Funds by Mr. Ashu Dutt			
4. Mutual Funds in India: Structure, Performance, And Undercurrents by Rakesh Kumar			
5. A Guide to Indian Mutual Fund Investment by Dr. Susanta Kumar Mishra			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
GENERAL ELECTIVE : FINANCIAL INSTITUTIONS AND MARKET						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 603	Financial Institutions and Market					4
Preamble: This course aims at facilitating the students to enhance their knowledge on financial institutions and markets and their system of operation.						
Prerequisite: Basic knowledge and idea on financial management.						
Course Out Comes (COs): To provide an overview of the financial system in India and functioning of various segments of the financial markets and the financial instruments						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Understand the Indian banking system and describe the role of regulatory bodies in regulating how banks manage their capital					
CO2	Describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates					
CO3	Understand the mechanics and conventions of the foreign exchange market and the motivation of different participants in trading foreign currencies					
CO4	Understand the housing finance, lease financing, venture capital financing and to apply in real life scenario					
CO5	Possess the ability to discuss and write about the links between the theory of financial markets and the reports in the financial press					
CO6	Communicate and explain specialised technical advice, knowledge and ideas, to professionals and non-experts involved with the financial services industry					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus

Unit	Course Contents	Hours	e-Resources/ e-Content
I	Definition of Bank, meaning, types, History of bank in India Definition of Customer, Relationship between Banker and Customer Rights of a Bank Types of Deposits; Designing of Deposit Schemes; Functions of commercial banks Systems of banking- Unit, Branch and Group banking	11	Black Board Teaching/ e-Pathshala/ Video clip
2	Bank rate, Prime Lending rate, Repo rate, Deposit rate, Impact of Interest rate, Bank Financial Statements: Bank Liabilities, Assets, Loans and Advances, Contingent. Liabilities The Income Statement: Analyzing Banks' Financial Statements Performance Indicators; Camel's ratings	18	Black Board Teaching/ e-Pathshala
3	Definition of Customer, Relationship between Banker and Customer Rights of a Bank Types of Deposits; Designing of Deposit Schemes; Functions of commercial banks Systems of banking- Unit, Branch and Group banking.	15	Black Board Teaching
4	Purpose and process of Credit Appraisal, Use of Financial parameters, Defining Credit Risk: Exposure norms, prudential norms, Asset Classification, Income Recognition and Provisioning, BASEL II principles, Concept of Capital Adequacy	18	Black Board Teaching/ e-Pathshala
5	Definition of Non-Banking Financial Companies Merchant Banking and Regulatory Framework Concept of Credit Rating, Rating symbols and Rating framework Meaning of Securitization, Features and Types of Securitizations. Meaning of Venture Capital, Features of Venture Capital Finance, Venture Capital Finance Vs. Conventional finance, Stages and Exit Process of Venture Capital Finance	13	Black Board Teaching/ e-Pathshala
Total		75	
Reference Books:			
1. <u>Guruswamy, Dr. S, Financial Services, McGraw Hill Publication</u>			
2. Khan, M.Y., Financial Services, Tata McGraw Publication			
3. Paul, Justin and Padmalatha, Suresh. Management of Banking and Financial Services, Pearson Education			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): SERVICE MARKETING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 604A	Service Marketing					4
Preamble: This course aims at facilitating the students to enhance their knowledge on marketing activities of service sectors along with customer behaviour and managing service quality.						
Prerequisite: Basic knowledge and idea on Service sectors and marketing management.						
Course Out Comes (COs): The objective of the course is to develop an understanding of services and service marketing with emphasis on various aspects of service marketing which make it different from goods marketing.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Explain the unique challenges of services marketing, including the elements of product, price, place, promotion, processes, physical evidence, and people.					
CO2	Explain service blueprinting, the integration of new technologies, and other key issues facing today's customer service providers and service managers					
CO3	Understand Consumer Behaviour in Services, Customer Expectations and Perception of Service.					
CO4	Understand Service Quality and Productivity, Measures of Service Quality, SERVQUAL Scale.					
CO5	Discuss the influences of the multicultural marketplace, business ethics, and socially responsible marketing on services marketing					
CO6	Integrate course concepts into individual performance to become better customer service representatives in the service environment					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Service concept, service industry, nature of services, characteristics of service, classification, importance, 7ps of services, types of customers	15	Black Board Teaching/ e-Pathshala/ Video clip
2	Concept-Customer expectation, customer perception & customer experience of service, factors affecting buying decision, buyer decision making process, post purchase decision	18	Black Board Teaching/ e-Pathshala
3	New service development, Service life cycle, Positioning and differentiation of services, marketing communication, Service delivery channel, branding	17	Black Board Teaching
4	Customer relationship management, Customer satisfaction, SERVQUAL, GAP model, customer delight, service failure and recovery, services and technology	18	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on relevant topics.	7	Case studies from internet.
Total		60	
Reference Books:			
1. Lovelock C, Service Marketing, Pearson Education			
2. Venugopal V/ Raghu V N, Services Marketing, Himalaya Publishing House			
3. Apte G, Service Marketing, Oxford University Press			
4. Jha S M, Service Marketing, Himalaya Publications			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): E-MARKETING						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 605A	E-Marketing					5
Preamble: This course aims at facilitating the students to enhance their knowledge on E- marketing activities of service sectors along with customer behaviour and managing service quality.						
Prerequisite: Basic knowledge and idea on E commerce.						
Course Out Comes (COs): The objective of this course is to provide students with the basic knowledge of E-Marketing. The course will stress on the concepts of how a business can be operated through electronic forms and the various issues related to e-marketing						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Remember the definition and understand the objectives & features of E-Marketing					
CO2	Analyze the problems in E-Marketing					
CO3	Understand the types of e-market and e-customers					
CO4	Understand the basic concepts of E-Commerce, Electronic Payment System and the security issues associated with it					
CO5	Understand the concepts of Social Media Marketing, Pay-per-click advertising, SEO etc.					
CO6	Describe in detail the implementation of an e-marketing plan, including the management of necessary internal organisational change					

Mapping the Programme Outcomes															
COs/ Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Objectives, Definition, History and, Features of E-	18	Black Board

	Marketing, Definition of E-Marketing, History of E-Marketing, Features of E-Marketing, E-marketing: Scope, Benefits and Problems, Scope of E-Marketing, Benefits of E-Marketing, Problems in E-Marketing, E-marketing Techniques, Internet Marketing, Digital Marketing and E-marketing		Teaching/ e-Pathshala/ Video clip
2	Objectives, Importance, Customers/Buyers (Impulsive, Patient and Analytical Sellers and Products), Infrastructure (Building a Product System), Intermediaries, Other Business Partners, Support Services, Digital Products	16	Black Board Teaching/ e-Pathshala
3	Definition of E-Customers, Dealing with Customers' Motivations and Expectations, Fears and Phobias of Online Customers, Online Buying Process, Types of E-Market - Introduction, Objectives, Definition of E-market, E-Malls, E-Storefront, E-Marketplace	18	Black Board Teaching
4	E-Mail Marketing, creating a Website, Social Media Marketing, Pay-Per-Click Advertising, Search Engine Optimization or Paid Search Engine Listing Search Engine Marketing, Blogging and Classified Advertising	16	Black Board Teaching/ e-Pathshala
5	Cases will be discussed on relevant topics.	7	Case studies from internet.
Total		75	
Reference Books:			
1. Balaguruswamy, E. Fundamentals of Computers (McGraw Hill Education)			
2. Goyal, D.P. MIS, McMillan India			
3. Rajaraman, V. Fundamentals of Computers, Prentice Hall of India			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): CHANGE MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 604B	Change Management					4
Preamble: This course aims at facilitating the students to enhance their knowledge on importance and necessity of introducing change and benefits of introducing change in organisation.						
Prerequisite: Basic knowledge and idea on Human Resource management functions.						
Course Out Comes (COs): This course is geared toward deepening your understanding of the challenges, the techniques, and the problems associated with initiating and implementing major change in an organization. Throughout the course, the objective will be to prepare managers to meet the challenges of organizational change successfully.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Explain the relevance of a range of change management approaches and models to a variety of situations where appropriate by identifying, apply a range of skills relevant to the change management process					
CO2	Understand and use negotiation tactics and also learn to resolve conflict inside the organization					
CO3	Use diagnostic tools and models to explore underlying organizational and behavioural issues that may affect the change process					
CO4	Display a clear understanding of the role of ‘change agents’ and its applicability in organizational settings					
CO5	Understanding cultural differences is critical for the success of an organization worldwideas there are roles played by culture that influences talent management strategies and practices at workplace					
CO6	Understanding cultural differences is critical for the success of an organization worldwideas there are roles played by culture that influences talent management strategies and practices at workplace					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Organisational Change: Meaning, Objectives, Needs, Effectiveness and Development. Theories of Planned Change: Lewin's Change Model and Action Research Model. Role of Management in Change Management	11	Black Board Teaching/ e-Pathshala/ Video clip
2	Different Elements of Organisation for Change: Structure, Culture, Technology, Strategies, Leadership. Skill of Change Agent: Meaning, Types and Competencies required to Change Agent. Power and Politics in Change Management	14	Black Board Teaching/ e-Pathshala
3	The Process of Change Management. The process and importance of Empowerment, Organisational Learning, Creativity and Innovation, Conflict and Negotiation, Inter group behaviour and Collaboration in Change Management process	17	Black Board Teaching
4	Business Ethics and Corporate Governance, Gender Issues and Cross-Cultural Dynamics in Change Management. Concept of Team Work in Change Management Process	10	Black Board Teaching/ e-Pathshala
5	Different cases will be discussed on above mentioned Change model and other relevant concept of Change Management	8	Case studies from various sources of internet.
Total		60	
Reference Books:			
1. French, W.E. and Bell, C.H.: organizational Development, PHI			
2. Daft. R. L.: Organisational Theory, Change and Design, Cengage Learning			
3. Rao, S.R. etc: Effective Organisation and Social Values, Sage			
4. Khandawalla, P.N.: organizational Design for Excellence, Tata Mc. Graw Hill			
5. Felkins P. K., Chakiris B. J. and Chakiris K. N.: Change Management, Quality Resources			
6. Srivastava B: Organisation Design and Development, Biztantra, 1st edition, New Delhi, 2007			
7. Jones G.R and Methew M: Organisational Theory Design and Change, 5th edition, New Delhi, 2007			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): INDUSTRIAL RELATION						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 605B	Change Management					5
Preamble: This course aims at facilitating the students to enhance their knowledge on importance and necessity of maintaining and having public relation in global competitive world.						
Prerequisite: Basic knowledge and idea on organisational behaviour and Human resource management.						
Course Out Comes (COs): The course helps the student understand and apply the concept of industrial relations and the system in which it operates						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	It gives the idea on labour market of India more specifically about Indian labour, Employment trend of Indian Labour					
CO2	It also facilitates in getting understanding that how worker's organisation and Employers' organisation can play role in establishing as well as in defining Industrial relations					
CO3	It discusses why disputes arise in organisation and how these can be controlled					
CO4	It helps in having a better understanding that how industrial disputes can be settled at different stages and why introduction of Labour welfare is important					
CO5	It helps in knowing the different organisations who works as regulatory mechanism with workers					
CO6	It gives the idea on different techniques that are practiced by different corporate in handling different labour issues					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-

			Content
I	Industrial Relations: Meaning, nature, scope, functions. Industrial Labour in India: Growth, Characteristics of Indian Labour, Employment trends. Bargaining Agents: Trade union and Employer's organisation, Trade Union: Meaning, Function and Problems	13	Black Board Teaching/ e-Pathshala/ Video clip
2	Industrial Dispute: Concept, Causes, Types, Tools and Techniques for settling Industrial Dispute in the hands of workers. Statutory provisions for Settling Industrial Dispute: Conciliation, Arbitration and Adjudication. Bipartite and Tripartite Negotiations	18	Black Board Teaching/ e-Pathshala
3	Collective Bargaining: Meaning, Types and Role in maintain Industrial Peace. Workers Participation in Management: Meaning, Levels or Types. Role of Workers' Education in Industrial Relation and Industrial Peace. Labour Welfare: Meaning, Types and its Importance. ILO: Concept and its function.	20	Black Board Teaching/ Case studies
4	Labour Law: Meaning, Types and its role in Industrial Relation. Basics of The Factories Act, 1948 and The Industrial Dispute Act, 1947	17	Black Board Teaching/ e-Pathshala
5	Different cases will be discussed on relevant topics	7	Case studies from various sources of internet.
Total		75	
Reference Books:			
1. Mamoria & Mamoria, <i>Dynamics of Industrial Relations in India</i> , Himalaya Publishing House			
2. Venkataraman, C.S, <i>Indian Industrial Relations</i> , National Institute of Personnel Management			
3. Monappa: <i>Industrial Relations</i> , Tata McGraw Hill			
4. Ivancovich, J.M: Human Resource Management, Tata McGraw-Hill Publication, 10 th edition, 2008			
5. Rao, V.S, Krishna, V.H: Management, Excel Books, 2002			
6. Dessler, G: Human Resource Management, Pearson Education, 10 th edition, USA, 2005			
7. Singh, B.D: Labour Laws for Managers, Excel Books, IST, New Delhi, 2009			
8. Kapoor. N.D: Handbook of Industrial Law, S. Chands Son, 13th edition, New Delhi, 2008			
9. Singh. B.D: Industrial Relations and Labour Laws, Excel Book, IST, New Delhi, 2008			
10. Sinha, P.R.N and Sinha, I.B: Industrial Relations Trade Union and Labour, Pearson Education, IST, New Delhi, 2008.			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): FINANCIAL SERVICES						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 604C	Financial Services					4
Preamble: This course aims at facilitating the students to enhance their knowledge on financial services industry, operations of merchant banking system and lease financing.						
Prerequisite: Basic knowledge and idea on financial system of the country.						
Course Out Comes (COs): To acquaint the students with innovative financial services to meet the requirements of both the corporate and individual customers						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	Exercise informed commercial judgment within a professional setting which emphasizes ethical and responsible decision making					
CO2	A capacity to integrate technical and conceptual knowledge, and interpersonal skills to work effectively within the Financial Services Industry					
CO3	Think critically and creatively to identify better solutions within business constraints allowing to acquire and synthesize information within a complex professional setting					
CO4	Communicate and explain specialized technical advice, knowledge and ideas, to professionals and non-experts involved with the Financial Services Industry					
CO5	Reflect upon work practices, conceptual frameworks and performance feedback and action ongoing professional development					
CO6	Explain and define the nature of the financial services industry with respect to providing personal planning services					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-

			Content
I	An overview of the financial services industry Meaning, definition, types of financial service Various services offered by financial service industry in India Challenges faced by financial services industry in India	10	Black Board Teaching/ e- Pathshala/ Video clip
2	Meaning of merchant bank, merchant bank vs commercial bank Services offered by merchant bank Role of merchant banker in issue management – opportunities and challenges Regulatory framework and SEBI guidelines on merchant banking activities Strategies for pricing, packaging and marketing an issue	12	Black Board Teaching/ e- Pathshala
3	Introduction, concept and classification of lease financing Lease documentation, legal aspect and tax aspect, Financial evaluation, lease v/s hire purchase, Financial risk management Technique and hedging instruments, Hedging using financial futures and options	15	Black Board Teaching/ Case studies
4	Concepts and forms function of a factor Legal aspect and evaluation of factoring Factoring vis-à-vis forfeiting, Venture capital, nature, scope and regulatory framework, Venture capital investment process, evaluation criteria, limitation, future of venture capital in India	11	Black Board Teaching/ e- Pathshala
5	Importance of Mutual Funds, Types of Mutual Funds Organization of firm, Facilities available to investors Recent reforms in Mutual Funds, Selection of Funds Scenario of Mutual Funds in India – Problems and Future prospects	12	Black Board Teaching/ e- Pathshala.
Total		60	
Reference Books:			
1. Khan, M.Y., Financial Services, Tata Mc. Graw Hill			
2. Gurusamy, Dr. S., Financial Services and Markets, Thomson			
3. Pathak, Bharati V., Indian Financial System, Pearson Education			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): WORKING CAPITAL MANAGEMENT						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
BBA 605C	Working Capital Management					5
Preamble: This course aims at facilitating the students to enhance their knowledge on working capital and its estimation and management.						
Prerequisite: Basic knowledge and idea on working capital.						
Course Out Comes (COs): The objective of the course is to acquaint the students with the importance of the working capital and techniques used for effective working capital management.						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	The course would enable the students to Identify and summarize the essential theories and concepts of modern working capital Management. Constitute a comprehensive introduction to basic concepts of working capital management.					
CO2	The course would enable the students to apply the theories learned to the real world and use them in short-term financial decision makings.					
CO3	This course would enable the students to apply corporate cash management, bank relations, Credit policy, credit appraisal and accounts receivable management into real life situations					
CO4	This course would enable the students to understand and apply inventory management techniques into real life situations of the enterprise					
CO5	This course would enable the students to understand and apply cash management techniques into real life situations of the enterprise.					
CO6	Sources of financing working capital of business organization in today's context.					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Operating Cycle, Production Cycle, Distribution Cycle, Pipeline Inventories, Factors determining Working Capital Requirements, Importance of Optimum Working Capital, Working Capital Policy and Management, Profitability v/s Liquidity. Types of Working Capital: Permanent-Temporary, Financing Working Capital, Working Capital Monitoring and Control.	13	Black Board Teaching/ e-Pathshala/ Video clip
2	Estimation Procedure, Working Capital Based on Operating Cycle, Different Components of Working Capital, Estimation of Working Capital Requirements.	15	Black Board Teaching/ e-Pathshala
3	Cash Management, Factors Affecting Cash Needs, Cash Budget, Control Aspects, Managing the Float, Investment of Surplus Cash	15	Black Board Teaching/ Case studies
4	Costs And Benefits of Receivables, Credit Policy, Credit Evaluation, Credit Control, Factoring and Receivables Management, Forfeiting, Evaluation of Credit Policies. Inventory Management: Types of Inventories, Cost of Maintaining Inventory, Techniques of Inventory Management, Risks in Inventory Management	16	Black Board Teaching/ e-Pathshala
5	Types Of Spontaneous Sources, Trade Credit, Commercial Paper, Annualized Cost Of Financing, Types Of Bank Credit, Other Sources of Short Term Financing, Regulation of Bank Credit In India.	16	Black Board Teaching/ e-Pathshala.
Total		75	
Reference Books:			
1. I. M. Pandey, Financial Management, Noida: Vikas Publishing House Private Ltd, 2010			
2. Prasanna Chandra, Fundamentals of Financial Management, New Delhi: Tata McGraw Hill, 2007			
3. V. K. Bhalla, Working Capital Management: Text and Cases, New Delhi: Anmol Publisher, 2008			
4. M .Y. Khan and P. K. Jain, Financial Management - Text, Problems and Cases, New Delhi: Tata McGraw Hill, 2009			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			

SEMESTER -VI						
DISCIPLINE SPECIFIC CENTRIC (SKILL): FUNDAMENTALS OF HUMAN VALUES AND PROFESSIONAL ETHICS						
Course Code	Course Name	Category	Lecture	Tutorial	Practical (P)	Credit
HVP-760	Fundamentals of Human Values and Professional Ethics					Non-credit Compulsory
Preamble: This course aims at facilitating the students to enhance their knowledge on values and ethics while performing various tasks and decision in organisation.						
Prerequisite: Basic knowledge and idea on values and ethics.						
Course Out Comes (COs): The course aims at introducing the Undergraduate students with the fundamental concepts and ideas on morality and ethics. It is also aimed to give basic understanding and an insight to the diverse elements and aspects relating to cultural and religious values, human virtues, professional ethics in local and global context						
CO Number	Course Outcome (CO) Statements					Blooms Taxonomy Knowledge Level
CO1	To introduce the students about the importance of human values and professional ethics					
CO2	To understand the ethical concerns in professional and personal space					

Mapping the Programme Outcomes															
COs/Pos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1															
CO2															
CO3															
CO4															
CO5															
CO6															
S: Strong; L: Low; M: Medium															

Syllabus			
Unit	Course Contents	Hours	e-Resources/ e-Content
I	Fundamentals of Ethics. Fundamentals of Values: Values embedded in different religions; Religious Tolerance Monitoring and Control.	8	Black Board Teaching/ e-Pathshala/ Video clip
2	Concept of Human Virtues, Gender Equality, Diversity in ability, Cultural acceptability. Social Concerns: Evils of Dowry & Caste System, Racial Discrimination, Depression	8	Black Board Teaching/ e-Pathshala

3	Fundamentals of Professional Ethics. Professional crimes Professional Rights	8	Black Board Teaching/ Case studies
4	Cyber Ethics and Etiquette. Ethics in cyber and professional space. Environmental Ethics; Ethics in Research	16	Black Board Teaching/ e- Pathshala
Total		29	
Reference Books:			
1. Jayashree Suresh and B S Raghavan- <i>Human Values and Professional Ethics: Values and Ethics of Profession</i> . S Chand, 2005			
2. Martin, Clancy, Wayne Vaught, and Robert Solomon (eds.)- <i>Ethics Across the Professions: A Reader for Professional Ethics</i> . Oxford: Oxford University Press, 2010			
3. R.R. Gaur, R. Sangal and G.P. Bagaria- <i>A Foundation Course in Human Values and Professional Ethics</i> (Paperback). Excel Books, 2010			
4. Terrence M. Kelly- <i>Professional Ethics: A Trust-Based Approach</i> . Lexington Books, 2018.			
5. R. S. Naagarazan- <i>Professional Ethics and Human Values</i> . New Age International (Second ed.), 2019			
Focus of Course: Employability			
e-Content: Vidya-mitra/ e-Pathshala			