

# Sant Gadge Baba Amravati University, Amravati

## NEP Syllabus

### UG Programme

**Faculty:** Science and Technology

**Programme:** B. Sc. (Biochemistry)

**Course:** B.Sc I Semester I : Open Elective

#### FACULTY: SCIENCE AND TECHNOLOGY

Teaching and learning scheme: For the Degree of Bachelor of Science

(Three Years- Six Semesters Bachelor's Degree Programme)

#### FIRST YEAR : SEMESTER-1

Level	Sem	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max Marks
4.5	I	103203	Biochemistry in Health and Disease	2	30	2 Hrs	30
		103204	Plant Biotechnology	2	30	2 Hrs	30

Level	Sem	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max Marks
4.5	I	103203	Biochemistry in Health and Disease	2	30	2 Hrs	30

#### 103203 Open Elective 1: Biochemistry in Health and Disease

##### Course Objective:

- To investigate metabolic disorders, and understand the biochemical basis of these conditions.
- Discuss the relevance of biochemistry in public health, disease prevention, and healthcare practices.

##### Course Outcomes: Upon completion of the course, students would be able to

1. Understand the molecular mechanisms underlying various diseases, including genetic disorders, metabolic diseases, and cancer
2. Understand the molecular mechanisms of cancer and AIDS

3. Define and understand the concept of syndromes.		
Unit System	Contents	Workload
<b>Unit 1- Health and wellness</b>	<ul style="list-style-type: none"> <li>a. WHO definition of health, Health and hygiene, General health care, Factors affecting health</li> <li>b. Indices and evaluation of health, Disease patterns in developed and developing world</li> <li>c. Classification of diseases-Endemic, Epidemic, Pandemic; Professional health hazards. Disease conditions: Acute disease, chronic disease, Incurable disease, Terminal disease, Illness, disorders, Syndrome, Pre-disease.</li> <li>d. Treatment: Psychotherapy, Medications, Surgery, Medical devices, and Self-care. Dimensions of Health: Physical, Mental, Spiritual, Emotional, Environmental, and Philosophical.</li> </ul>	8
<b>UNIT-2 Diseases and disorders</b>	<ul style="list-style-type: none"> <li>a. Communicable diseases: Tuberculosis, Cholera, Typhoid, Conjunctivitis.</li> <li>b. Sexually transmitted diseases (STD): Information, statistics, and treatment guidelines for STD, Prevention</li> <li>c. Syphilis, Gonorrhoea, AIDS. Non-communicable diseases: Malnutrition Undernutrition, Overnutrition</li> <li>d. Nutritional deficiencies; Anemia, Stroke, Rheumatic heart disease, Coronary heart disease, Cancer, blindness, accidents, mental illness</li> </ul>	8
<b>UNIT-3 Cancer and important syndrome</b>	<ul style="list-style-type: none"> <li>a. Cancer, blindness, Iodine deficiency, Fluorosis, Epilepsy, Asthma.</li> <li>b. Genetic disorders: Down's syndrome, Klinefelter's syndrome,</li> <li>c. Turner's syndrome, Thalassemia, Sickle cell anemia.</li> <li>d. Lifestyle disorders: Obesity, Liver cirrhosis, Diabetes mellitus, Hypertension (Causative agents, symptoms, diagnosis, treatment, prognosis, prevention)</li> </ul>	7
<b>UNIT-4 Health and awareness</b>	<ul style="list-style-type: none"> <li>a. Preventing drug abuse, Oral health promotion by tobacco control. Mental hygiene and mental health: Concepts of mental hygiene and mental health,</li> <li>b. Characteristics of mentally healthy person, Warning signs of poor mental health, Promotive mental health, strategies and services</li> <li>c. Ego defense mechanisms and implications, Personal and social adjustments, Guidance and Counseling.</li> <li>d. Infection control: Nature of infection, Chain of infection transmission, Defenses against infection transmission</li> </ul>	7
<p>References:</p> <ol style="list-style-type: none"> <li>1. Harper's Illustrated Biochemistry" by Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, and P. Anthony Weil</li> <li>2. Lehninger Principles of Biochemistry" by David L. Nelson and Michael M. Cox Biochemistry" by Lubert Stryer, Jeremy M. Berg, and John L. Tymoczko</li> <li>3. Marks' Basic Medical Biochemistry" by Alisa Peet, Allan Marks, and Michael Lieberman</li> </ol>		

4. Medical Biochemistry" by John W. Baynes and Marek H. Dominiczak
5. Biochemistry: The Molecular Basis of Life" by Trudy McKee and James R. McKee
6. Biochemistry for Dummies" by John T. Moore and Richard H. Langley
7. Textbook of Biochemistry for Medical Students" by D. M. Vasudevan and S. Sreekumari
8. Clinical Biochemistry Made Ridiculously Simple" by Stephen Goldberg
9. Essential Biochemistry for Medicine" by Mitchell Fry and Harpal Singh Randeva

Level	Sem	Course Code	Course Name	Credits	Teaching Hours	Exam Duration	Max Marks
4.5	I	103204	Plant Biotechnology	2 periods	30	2 Hrs	30

#### 103204 Open Elective 2 - Plant Biotechnology

##### Course objectives:

- To learn the principles and methods of plant tissue culture, including the regeneration of whole plants from cells and tissues.
- To explore the development of genetically modified plants with enhanced resistance to pathogens and pests through biotechnological interventions.

##### Course Outcomes:

Upon completion of the course, the student will be able to

1. Understand the biosynthesis of secondary metabolites in plants, such as alkaloids, flavonoids, and terpenoids.
2. Demonstrate a comprehensive understanding of concept plant metabolism and Plant tissue culture
3. Understand the role of stress-related hormones in plant responses.
4. Is then an experiment using plant tissue culture techniques including micropropagation somatic embryo genesis and protoplast isolation
5. Design experimental studies to understand metabolic pathways

Unit systems	Contents	Workload Allotted in hours
Unit 1- Plant Metabolism	a. Equilibrium and concept of free energy, Coupled interconnecting reactions in metabolism, Types of metabolic pathways b. Overview of plant secondary metabolism- Main secondary	8

	<p>metabolites, Functions of secondary metabolites</p> <p>c. Compartmentation of SMs biosynthesis- Cytosol, mitochondria vesicle</p> <p>d. Golgi bodies, endoplasmic reticulum</p>	
<b>Unit 2- Plant tissue culture</b>	<p>a. Plant growth regulators</p> <p>b. Regeneration and micropropagation of plants, Clonal propagation, Organogenesis, shoot tip and meristem culture, Haploid culture, Protoplast culture, somaclonal variation</p> <p>c. Tissue culture and cell suspension culture system, methodology growth kinetics and nutrient optimization</p> <p>d. Plant transformation methods, hairy root culture</p>	7
<b>Unit 3- Plant cell technology</b>	<p>a. Secondary metabolite production, Principal design and operation of reactor</p> <p>b. Isolation characterization and production of secondary metabolites from different plant cell types</p> <p>c. Enhancing cold hand heat stress tolerance, Secondary effect of abiotic stress, production of ROS, gens involved in scavenging of ROS</p> <p>d. Enhancing drought and salt stress tolerance</p>	8
<b>Unit 4- Genetically modified organisms</b>	<p>a. Plant biotechnology in improving fruit ripening and enhancing photosynthesis</p> <p>b. Golden Rice, Bt cotton, Bt brinjal, transgenic sweet potato</p> <p>c. Enhancing resistance against Fungal Pathogen, Antimicrobial proteins</p> <p>d. Enhanced viral resistance, pathogen derived resistance, Herbicide resistance</p>	7
<b>References:</b>	<ol style="list-style-type: none"> <li>1. Introduction to Plant Biochemistry" by P.M. Dey and J.B. Harborne</li> <li>2. Plant Physiology and Biochemistry" by Eduardo Zeiger, Ian Max Møller, and Angus Murphy</li> <li>3. Principles of Plant Biotechnology: An Introduction to Genetic Engineering in Plants" by H.S. Chawla</li> <li>4. Plant Biotechnology: The Genetic Manipulation of Plants" by Adrian Slater, Nigel W. Scott, and Mark R. Fowler</li> <li>5. Biotechnology of Plant Secondary Metabolism: Methods and Protocols" edited by R. Verpoorte</li> <li>6. Plant Biotechnology: Recent Advancements and Developments" edited by M. Chakraborty and N.K. Srinivas</li> <li>7. Genetic Engineering of Plants: An Agricultural Perspective" by T. A. Brown</li> </ol>	

**The distribution of marks for the Internal Assessment shall be as follows:**

<b>Internal Assessment (Theory)</b>	
Continuous Assessment Tests  Three CAT each of 10 marks (MCQs) <ul style="list-style-type: none"><li>• Test 1 on completion of 25% syllabus of the course</li><li>• Test 2 on completion of 50% syllabus of the course</li><li>• Test 3 on completion of 75% syllabus of the course</li></ul> Total performance in CAT (i.e. 40%) shall be based on the best two out of three in CAT examinations	10 Marks
Any of the following assessment tools/methods  Seminar, case study, field work, mini project work, quiz or any innovative method	10 Marks
<b>Total</b>	20 Marks

# Sant Gadge Baba Amravati University, Amravati

Faculty: Science and Technology

**Programme: B.Sc. (Biochemistry)**

**Course : B.Sc I Semester II : Open Elective**

Teaching and Learning Scheme: for the Degree of Bachelor of Science (Three Years- Six Semesters Bachelor's Degree Programme)

NEP Syllabus

UG Programme

Level	Semester	Course code	Course Name	Credits	Teaching Hours	Exam Duration	Maximum marks
4.5	II	103207	<b>Nutritional Biochemistry</b>	2	30	2Hrs	30

Course Objective	The objective of the course is to provide the knowledge regarding nutritional value of food ingredients, nutrition associated problems, balanced diet for human health and certain nutritional biochemical aspects to students. The students can apply the basic knowledge of nutrition to overcome nutritional deficiency of various foods at commercial level by fortification. The better understanding of this subject helpful for students in their placements and research field.
Course outcomes:	<ul style="list-style-type: none"><li>• Knowledge about energy requirements and the Recommended Dietary Allowances</li><li>• Understanding the functions and role of macronutrients, their requirements and the effect of deficiency and excess</li><li>• Understand the impact of various functional foods on our health</li><li>• To be able to apply basic nutrition knowledge in making foods choices and obtaining an adequate diet.</li></ul>

	<ul style="list-style-type: none"> <li>• Competence in connecting the role of various nutrients in maintaining health and learn to enhance traditional recipes.</li> </ul>
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<b>Unit</b>	<b>Content</b>	<b>Workload Allotted in hours</b>	<b>Weightage Of Marks Allotted</b>	<b>Pedagogy</b>
UNIT-1 Basic concepts of Nutrition	<ul style="list-style-type: none"> <li>• Introduction, Basic principles of a balanced diet to provide energy and nutrients.</li> <li>• Composition of foods and proximate analysis of foods. Calorific value of foods and Basal metabolism.</li> <li>• Basal Metabolic Rate (BMR), Factors affecting BMR, Energy requirements for different physical activities, Specific dynamic action of food,</li> <li>• Nutritive value of proteins. Energy requirements and recommended dietary allowance (RDA) for infants, children, and pregnant women. Protein calorie malnutrition.</li> </ul>	8	8	Chalk and board  Power point presentation,  Videos, Animation etc
UNIT-2 Macronutrients and Micronutrients	<ul style="list-style-type: none"> <li>• Carbohydrates-Digestible and non-digestible, Dietary fibres, Essential fatty acids, lipoproteins and cholesterol. Essential amino acids, Fortification of foods, Protein requirement for different categories.</li> <li>• Vitamins: Sources, requirements,</li> </ul>	7	7	Chalk and board  Power point presentation,  Videos, Animation etc

	<p>functions and deficiency symptoms of Vitamin-C, Thiamine, Riboflavin, Pyridoxine, Folic acid, VitaminB12.</p> <ul style="list-style-type: none"> <li>• Absorption of fat-soluble vitamins- A, D, E and K.</li> <li>• Micronutrients: Source, Daily requirement, functions and deficiency disease symptoms of Macrominerals (Ca, P, and Cl) and microminerals/trace elements (I, Fe, Zn and Se).</li> </ul>			
UNIT-3 Dietetics	<ul style="list-style-type: none"> <li>• Food pyramid; Diet planning and introduction to diet therapy.</li> <li>• Nutritional requirements for different age groups, anemic child, expectant women, and lactating women.</li> <li>• Diet planning for prevention and cure of nutritional deficiency disorders.</li> <li>• Diet therapy: Functional foods, Anthropometric measurements,</li> </ul>	<b>8</b>	<b>8</b>	<p>Chalk and board</p> <p>Power point presentation, Videos, Animation etc</p>
Unit-4 Diet Therapy	<ul style="list-style-type: none"> <li>• Dietary considerations during fever, malaria, and tuberculosis.</li> <li>• Prevention and correction of obesity, underweight, and metabolic diseases by diet therapy.</li> <li>• Dietary interventions to correct and/or manage the gastro-intestinal diseases (indigestion, peptic ulcer,</li> </ul>	<b>7</b>	<b>7</b>	<p>Chalk and board</p> <p>Power point presentation, Videos, Animation</p>



	<p>constipation, diarrhoea, steatorrhoea, irritable bowel syndrome.</p> <ul style="list-style-type: none"> <li>• Functional food-based diet therapy for diabetes, cardiovascular disease and cancer.</li> </ul>			etc
<b>References</b>	<ol style="list-style-type: none"> <li>1. Clinical Dietetics and Nutrition, 2002, 4 th Edition, Antia FP and Abraham P, Oxford University Press; ISBN-10: 9780195664157.</li> <li>2. Oxford Handbook of Nutrition and Dietetics, 2011, Webster-Gandy J, Madden A and Holdsworth M. Oxford University Press, Print ISBN13:9780199585823.</li> <li>3. Krause’s Food, Nutrition and Diet therapy, 2003, Mahan KL and Escott-Stump S., Elsevier, ISBN: 9780721697840.</li> <li>4. Human Nutrition and Dietetics.1986, Passmore R. and Davidson S. Churchill Livingstone Publications, ISBN-10: 0443024863.</li> <li>5. Rosemary Stanton’s Complete Book of Food &amp; Nutrition, 2007, Simon &amp; Schuster Publishers, Australia, ISBN 10: 0731812999</li> <li>6. Food Science and Nutrition, 2018, RodayS.Oxford University Press Publishers, ISBN: 9780199489084/0199489084.</li> <li>7. Food Science, 2007, Srilakshmi S. New Age International (P) Limited Publishers, ISBN: 9788122420227/ 8122420222.</li> </ol>			
<b>Model Questions</b>	<p><b>Long Question:</b></p> <ol style="list-style-type: none"> <li>1. Discuss the importance of nutrition in maintaining overall health.</li> <li>2. Explain the role of macronutrients and micronutrients in the human diet.</li> <li>3. Discuss the principles of planning balanced and nutritious diets</li> <li>4. Explore the principles and applications of diet therapy in the management of various health conditions.</li> </ol>			

**Short Questions:**

1. What are the essential nutritional requirements for human health?
2. Describe the processes of digestion and absorption in the context of nutrition.
3. Provide examples of protein-rich food sources.
4. Discuss the consequences of iron deficiency and its prevalence.
5. What are dietary guidelines, and why are they important?
6. Explain the role of a dietitian in promoting health and preventing nutrition-related disorders.
7. Explain the significance of nutritional support in critical care settings.
8. Highlight the importance of tailoring diets to individual health needs.

**MCQs:**

1. The primary unit of measurement for energy derived from food is:
  - a. Gram
  - b. Calorie
  - c. Liter
  - d. Milligram
2. Macronutrients include:
  - a. Vitamins and minerals
  - b. Proteins, fats, and carbohydrates
  - c. Water and fiber
  - d. Antioxidants
3. Carbohydrates are primarily responsible for:
  - a. Providing structural support
  - b. Energy storage
  - c. Facilitating enzyme reactions
  - d. Enhancing immune function
4. Which food is a rich source of vitamin C?
  - a. Milk
  - b. Meat
  - c. Oranges
  - d. Nuts
5. The term "meal planning" in dietetics refers to:
  - a. Selecting random foods for consumption
  - b. Planning meals to meet nutritional needs
  - c. Avoiding all snacks
  - d. Fasting for an entire day

6. Dietitians often engage in:

- a. Selling nutritional supplements
- b. Providing nutritional counseling
- c. Performing surgical procedures
- d. Conducting medical research

7. Enteral nutrition involves:

- a. Oral intake of regular food
- b. Parenteral administration of nutrients
- c. Intravenous infusion of liquids
- d. Tube feeding directly into the digestive tract

8. In diet therapy, the primary role of a dietitian is to:

- a. Prescribe medications
- b. Conduct surgical procedures
- c. Provide nutritional counseling
- d. Manage patient records

Level	Semester	Course code	Course Name	Credits	Teaching Hours	Exam Duration	Maximum marks
4.5	II	103208	Biochemical Toxicology	2	30	2Hrs	30

<u>Course Objectives</u>	To acquire knowledge, understand and develop an understanding of the kinds of toxicant interactions, their impact on human health.
<u>Course Outcomes</u>	<p>After completion of this course students will be able to</p> <ul style="list-style-type: none"> <li>• Understand different types of toxins their biological process and effects on various organs/ systems of the human body</li> <li>• Be aware of dose absorption, excretion of the toxic components</li> <li>• Understand impact of toxin on renal, liver, neural systems</li> <li>• Identify underlying susceptibility factors which contribute to the ability of chemicals to elicit bio effects which contribute to human disease.</li> </ul>

Open Elective –Biochemical Toxicology				
Unit	Content	Workload Allotted in hours	Weightage Of Marks Allotted	Pedagogy
<u>UNIT 1</u> Definition and Scope of Toxicology	<ul style="list-style-type: none"> <li>• Definition and Scope of Toxicology: Dose-response relationship, synergism and antagonism, determination of ED50 &amp; LD50, acute and chronic exposure; clinical signs of systemic toxicity,</li> <li>• Toxicity Influencing factors Xenobiotic metabolism: absorption &amp; distribution,</li> <li>• Phase I reactions; oxidation,</li> </ul>	8	8	Chalk and board  Power point presentation,  Videos, Animation etc

	<p>reduction, hydrolysis and hydration;</p> <ul style="list-style-type: none"> <li>Phase II reactions/conjugation; Glucouronidation, Sulfation, Acetylation, methylation, glutathione and amino acid conjugations, detoxification.</li> </ul>			
<p><u>Unit-II</u></p> <p>Biochemical basis of toxicity</p>	<ul style="list-style-type: none"> <li>Biochemical basis of toxicity: Chemical Nature of Toxicants; Biochemical and Genetic mechanism of toxicity,</li> <li>Biochemistry of Mutagenesis, Biochemistry of Carcinogenesis; Genetic Susceptibility to Toxicants; Toxic response in Skin, Liver; Cardiovascular system; Endocrine system; Nervous system; Reproduction system; Kidney and Bladder.</li> <li>Toxicity testing: genetic toxicity testing &amp; mutagenesis assays - bacterial mutation tests, reversion test, ames test and fluctuation tests;</li> <li>In vivo mammalian mutation tests- host mediated assay &amp; dominant lethal test</li> </ul>	7	7	<p>Chalk and board</p> <p>Power point presentation,</p> <p>Videos,</p> <p>Animation etc</p>
<p><u>Unit-III</u></p> <p>Pesticide toxicity</p>	<ul style="list-style-type: none"> <li>Pesticide toxicity: Insecticides and their classification, mode of action, Insecticides- anti- cholinesterases insecticides,</li> <li>Role of biopesticides in environmental management.</li> <li>Metal &amp; Metalloid toxicity: Toxicity of Arsenic, Mercury, Lead, Chromium and Cadmium</li> <li>Toxic natural products: Mycotoxins; Toxic Substance of Plant; Insect Toxins; Spider Toxins Reptile Toxins &amp; Non reptile Toxins.</li> </ul>	8	8	<p>Chalk and board</p> <p>Power point presentation,</p> <p>Videos,</p> <p>Animation etc</p>
<p>Unit-IV</p> <p>Toxic</p>	<ul style="list-style-type: none"> <li>Toxic organic Compounds: toxicity of alkanes; toxicity of unsaturated non aromatic compounds;</li> </ul>	7	7	<p>Chalk and board</p>

Synthetic and Natural chemicals	<ul style="list-style-type: none"> <li>• Toxicity of Benzene, Naphthalene. Toxic organooxygen Compounds: Toxicity of alcohals,</li> <li>• Toxicity of Phenol, Formaldehyde , Carboxylic acids, Ethers, Acid Anhydrides, Esters</li> <li>• Food toxicology: Role of diet in cardio-vascular diseases and cancer; Toxicology of various types of food additives,</li> </ul>			Power point presentation, Videos, Animation etc
References	<ol style="list-style-type: none"> <li>1. General and applied toxicology, 1995 by Marrs and Turner Macmillan Press Ltd</li> <li>2. Basic environmental toxicology 1994 by Lorriss G. Corkerhem and Barbara SS Shane CRP Press Inc.</li> <li>3. Introduction to food technology TakayurkiShibamoto&amp;leonard F. Bzeldaanes</li> <li>4. A textbook of Modern Toxicology 3rd Edition 2004 by Ernest Hodgson</li> <li>5. Casarett and Doull's Toxicology 7th Edition 2008 By Curtis D. Klaassen</li> <li>6. Molecular biotechnology 2nd Ed 1994 by Barnard R Glick &amp; JJ Pasternak</li> </ol>			
Model Questions	<p><b>Long Question:</b></p> <ol style="list-style-type: none"> <li>5. Discuss the broad scope of toxicology, including its sub-disciplines and applications.</li> <li>6. Discuss the mechanisms of action of toxic substances at the biochemical level.</li> <li>7. Discuss the impact of pesticides on human health and the environment.</li> <li>8. Discuss factors influencing the perception of toxicity in different chemical sources.</li> </ol> <p><b>Short Questions:</b></p> <ol style="list-style-type: none"> <li>1. Why is toxicology important in the field of public health?</li> <li>2. Differentiate between Toxicity vs. Hazard</li> <li>3. What is enzyme inhibition in the context of biochemical toxicity?</li> <li>4. Define oxidative stress and its role in toxicity.</li> </ol>			

5. What is bioaccumulation, and how does it relate to pesticide toxicity?
6. Compare the toxicity of synthetic and natural chemicals.
7. Briefly explain the potential health risks associated with these chemicals.
8. Explain how even natural compounds can pose health risks.

**MCQs:**

1. The scope of toxicology includes the study of:
  - a. Environmental sustainability
  - b. Adverse effects of chemicals on living organisms
  - c. Astrophysics
  - d. Social psychology
2. What is a primary role of a toxicologist?
  - a. Studying celestial bodies
  - b. Analyzing market trends
  - c. Assessing the effects of chemicals on biological systems
  - d. Developing computer software
3. The metabolic activation of certain chemicals can:
  - a. Reduce toxicity
  - b. Increase toxicity
  - c. Have no effect on toxicity
  - d. Affect only plants
4. Toxicants may target:
  - a. Only the nervous system
  - b. Specific biochemical pathways or molecules
  - c. Exclusively water-soluble compounds
  - d. Inanimate objects
5. Integrated Pest Management involves:
  - a. The use of only chemical pesticides
  - b. Comprehensive strategies combining biological, cultural, and chemical controls
  - c. Ignoring the impact on non-target organisms

	<p>d. Exclusive reliance on genetically modified crops</p> <p>6. Chronic pesticide exposure refers to:</p> <ol style="list-style-type: none"> <li>a. Short-term exposure with immediate effects</li> <li>b. Long-term exposure over an extended period</li> <li>c. Exposure only to airborne pesticides</li> <li>d. Exposure limited to specific seasons</li> </ol> <p>7. Generally, biodegradable chemicals are:</p> <ol style="list-style-type: none"> <li>a. Less toxic</li> <li>b. More toxic</li> <li>c. Neither more nor less toxic</li> <li>d. Only present in natural substances</li> </ol> <p>8. Risk assessment of chemicals involves:</p> <ol style="list-style-type: none"> <li>a. Only considering synthetic chemicals</li> <li>b. Evaluating potential hazards and exposures</li> <li>c. Ignoring natural chemical risks</li> <li>d. Focusing solely on acute toxicity</li> </ol>
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**The distribution of marks for the Internal Assessment shall be as follows:**

<b>Internal Assessment (Theory)</b>	
<p>Continuous Assessment Tests</p> <p>Three CAT each of 10 marks (MCQs)</p> <ul style="list-style-type: none"> <li>• Test 1 on completion of 25% syllabus of the course</li> <li>• Test 2 on completion of 50% syllabus of the course</li> <li>• Test 3 on completion of 75% syllabus of the course</li> </ul> <p>Total performance in CAT (i.e. 40%) shall be based on the best two out of three in CAT examinations</p>	10 Marks
<p>Any of the following assessment tools/methods</p> <p>Seminar, case study, field work, mini project work, quiz or any innovative method</p>	10 Marks



<b>Total</b>	20 Marks
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