

**VI Semester**

<b>CONSTRUCTION MANAGEMENT AND ENTPRENEURSHIP</b>			
Course Code	<b>21CV61</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3+0+0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	3	Exam Hours	03
<p><b>Course objectives:</b> This course will enable students to</p> <ol style="list-style-type: none"> <li>1. Understand the concept of planning, scheduling, cost and quality control, safety during construction, organization and use of project information necessary for construction project.</li> <li>2. Inculcate Human values to grow as responsible human beings with proper personality.</li> <li>3. Keep up ethical conduct and discharge professional duties</li> <li>4. Develop an entrepreneurial outlook and mind set along with critical skills and knowledge to manage risks associated with entrepreneurs.</li> </ol>			
<p><b>Teaching-Learning Process (General Instructions)</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>1. Blackboard teaching/PowerPoint presentations (if needed)</li> <li>2. Regular review of students by asking questions based on topics covered in the class.</li> </ol>			
<b>Module-1</b>			
<p><b>Management:</b> Characteristics of management, functions of management, importance and purpose of planning process, types of plans.</p> <p><b>Construction Project Formulation:</b> Introduction to construction management, project organization, management functions, management styles.</p> <p><b>Construction Planning and Scheduling:</b> Introduction, types of project plans, work breakdown structure, Grant Chart, preparation of network diagram- event and activity based and its critical path critical path method, PERT method, concept of activity on arrow and activity on node.</p>			
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1.Blackboard teaching/PowerPoint presentations (if needed)</li> <li>2.Regular review of students by asking questions based on topics covered in the class.</li> </ol>		
<b>Module-2</b>			
<p><b>Resource Management:</b> Basic concepts of resource management, class of lab our, Wages &amp; statutory requirement, Labour Production rate or Productivity, Factors affecting labour output or productivity. <b>Construction Equipments:</b> classification of construction equipment, estimation of productivity for: excavator, dozer, compactors, graders and dumpers. Estimation of ownership cost, operational and maintenance cost of construction equipments. Selection of construction equipment and basic concept on equipment maintenance <b>Materials:</b> material management functions, inventory management.</p>			
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1.Blackboard teaching/PowerPoint presentations (if needed)</li> <li>2.Regular review of students by asking questions based on topics covered in the class.</li> </ol>		
<b>Module-3</b>			
<p><b>Construction Quality , safety and Human Values:</b> Construction quality process, inspection, quality control and quality assurance, cost of quality, ISO standards. Introduction to concept of Total Quality Management <b>HSE:</b> <b>Introduction</b> to concepts of HSE as applicable to Construction. Importance of safety in construction , Safety measures to be taken during Excavation , Explosives , drilling and blasting , hot bituminous works , scaffolds / platforms / ladder , form work and equipment operation. Storage of materials. Safety through legislation, safety campaign. Insurances. <b>Ethics :</b> Morals, values and ethics, integrity, trustworthiness , work ethics, need of engineering ethics, Professional Duties, Professional and Individual Rights, Confidential and Proprietary Information, Conflict of Interest Confidentiality, Gifts and Bribes, Price Fixing, Whistle Blowing.</p>			
<b>Teaching-Learning</b>	<ol style="list-style-type: none"> <li>1.Blackboard teaching/PowerPoint presentations (if needed)</li> </ol>		

<b>Process</b>	2.Regular review of students by asking questions based on topics covered in the class.
<b>Module-4</b>	
<p><b>Introduction: Principles of Engineering Economy</b>, Engineering Decision- Makers, Engineering and Economics, Problem solving and Decision making, Intuition and Analysis, Tactics and Strategy. Interest and Interest Factors: Interest rate, Simple interest, Compound interest, Cash- flow diagrams, Exercises and Discussion.</p> <p><b>Comparison of alternatives:</b> Present worth, annual equivalent, capitalized and rate of return methods, Minimum Cost analysis and break even analysis.</p> <p><b>Replacement Analysis:</b> Replacement studies, replacement due to deterioration, obsolescence, inadequacy, economic life for cyclic replacements, Exercises, Problems. Break- Even Analysis: Basic concepts, Linear Break- Even analysis, Exercises, Problems.</p> <p><b>Depreciation:</b> Causes of Depreciation, Basic methods of computing depreciation charges, Exercises, Problems.</p>	
<b>Teaching-Learning Process</b>	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.
<b>Module-5</b>	
<p><b>Introduction to Entrepreneurship</b> – Learn how entrepreneurship has changed the world. Identify six entrepreneurial myths and uncover the true facts. Explore E-cells on Campus <b>Listen to Some Success Stories:</b> - Global legends Understand how ordinary people become successful global entrepreneurs, their journeys, their challenges, and their success stories. Understand how ordinary people from their own countries have become successful entrepreneurs.</p> <p><b>Characteristics of a Successful Entrepreneur</b> Understand the entrepreneurial journey and learn the concept of different entrepreneurial styles. Identify your own entrepreneurship style based on your personality traits, strengths, and weaknesses. Learn about the 5M Model, each of the five entrepreneurial styles in the model, and how they differ from each other. <b>Communicate Effectively:</b> Learn how incorrect assumptions and limiting our opinions about people can negatively impact our communication. Identify the barriers which cause communication breakdown, such as miscommunication and poor listening, and learn how to overcome them.</p> <p><b>Business Planning Process:</b> Business planning process, marketing plan, financial plan, project report and feasibility study, guidelines for preparation of model project report for starting a new venture. Introduction to international entrepreneurship opportunities, entry into international business, exporting, direct foreign investment, venture capital.</p>	
<b>Teaching-Learning Process</b>	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.
<p><b>Course outcome (Course Skill Set)</b></p> <p>At the end of the course the student will be able to :</p> <ol style="list-style-type: none"> <li>1.Understand various management principles of construction industry (L2)</li> <li>2.Use planning, organizing, scheduling, monitoring and controlling techniques for managing construction activity (L4)</li> <li>3.Understand importance of quality control and safety in construction.(L2)</li> <li>4. Understand managing data pertaining to construction project. (L4)</li> <li>5. Evaluate alternatives and develop capital budget for different scenarios.</li> </ol>	

### **Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% ( 18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

#### **Continuous Internal Evaluation:**

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5<sup>th</sup> week of the semester
2. Second test at the end of the 10<sup>th</sup> week of the semester
3. Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4<sup>th</sup> week of the semester
5. Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

#### **Semester End Examination:**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module

1. P C Tripathi and P N Reddy, "Principles of Management", Tata McGraw-Hill Education
2. Chitkara, K.K, "Construction Project Management: Planning Scheduling and Control", Tata McGraw Hill Publishing Company, New Delhi.
3. Poornima M. Charantimath, "Entrepreneurship Development and Small Business Enterprise", Dorling Kindersley (India) Pvt. Ltd., Licensees of Pearson Education
4. Dr. U.K. Shrivastava "Construction Planning and Management", Galgotia publications Pvt. Ltd. New Delhi.
5. Bureau of Indian standards – IS 7272 (Part-1)- 1974 : Recommendations for labour output constant for building works:
5. Engineering Economy, Riggs J.L., 5th Edition, Tata McGraw Hill, ISBN 0-07-058670-5
6. Engineering Economics, R Panneerselvam, Eastern Economy Edition 2001, PHI, ISBN – 81- 203-1743-2.
7. Cost Accounting, Khan M Y, 2nd Edition, 2000, Tata McGraw-Hill, ISBN 0070402248
8. Mechanical Estimating & Costing, T.R.Banga, S.C.Sharma, 16th Edition, 2011, Khanna Publishers, ISBN 8174091009

#### **Web links and Video Lectures (e-Resources):**

- Online study material
- You Tube video lectures

#### **Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Seminars/Quizz(To assist in GATE Preparations
- Self Study on simple topics
- Case Study Presentation

<b>B. E. MECHANICAL ENGINEERING</b>			
<b>Outcome Based Education (OBE) and Choice Based Credit System (CBCS)</b>			
<b>SEMESTER - III</b>			
<b>CONSTITUTION OF INDIA, PROFESSIONAL ETHICS AND CYBER LAW (CPC)</b>			
Course Code	<b>18CPC39/49</b>	CIE Marks	40
Teaching Hours/Week (L:T:P)	(1:0:0)	SEE Marks	60
Credits	01	Exam Hours	02
<b>Course Learning Objectives: To</b>			
<ul style="list-style-type: none"> <li>• know the fundamental political codes, structure, procedures, powers, and duties of Indian government institutions, fundamental rights, directive principles, and the duties of citizens</li> <li>• Understand engineering ethics and their responsibilities; identify their individual roles and ethical responsibilities towards society.</li> <li>• Know about the cybercrimes and cyber laws for cyber safety measures.</li> </ul>			
<b>Module-1</b>			
<b>Introduction to Indian Constitution:</b> The Necessity of the Constitution, The Societies before and after the Constitution adoption. Introduction to the Indian constitution, The Making of the Constitution, The Role of the Constituent Assembly - Preamble and Salient features of the Constitution of India. Fundamental Rights and its Restriction and limitations in different Complex Situations. Directive Principles of State Policy (DPSP) and its present relevance in our society with examples. Fundamental Duties and its Scope and significance in Nation building.			
<b>Module-2</b>			
<b>Union Executive and State Executive:</b> Parliamentary System, Federal System, Centre-State Relations. Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism. State Executives – Governor, Chief Minister, State Cabinet, State Legislature, High Court and Subordinate Courts, Special Provisions (Articles 370,371,371J) for some States.			
<b>Module-3</b>			
<b>Elections, Amendments and Emergency Provisions:</b> Elections, Electoral Process, and Election Commission of India, Election Laws. Amendments - Methods in Constitutional Amendments (How and Why) and Important Constitutional Amendments. Amendments – 7,9,10,12,42,44, 61, 73,74, ,75, 86, and 91,94,95,100,101,118 and some important Case Studies. Emergency Provisions, types of Emergencies and its consequences.			
<b>Constitutional special provisions:</b> Special Provisions for SC and ST, OBC, Women, Children and Backward Classes.			
<b>Module-4</b>			
<b>Professional / Engineering Ethics:</b> Scope & Aims of Engineering & Professional Ethics - Business Ethics, Corporate Ethics, Personal Ethics. Engineering and Professionalism, Positive and Negative Faces of Engineering Ethics, Code of Ethics as defined in the website of Institution of Engineers (India): Profession, Professionalism, and Professional Responsibility. Clash of Ethics, Conflicts of Interest. Responsibilities in Engineering Responsibilities in Engineering and Engineering Standards, the impediments to Responsibility. Trust and Reliability in Engineering, IPRs (Intellectual Property Rights), Risks, Safety and liability in Engineering			
<b>Module-5</b>			
<b>Internet Laws, Cyber Crimes and Cyber Laws:</b> Internet and Need for Cyber Laws, Modes of Regulation of Internet, Types of cyber terror capability, Net neutrality, Types of Cyber Crimes, India and cyber law, Cyber Crimes and the information Technology Act 2000, Internet Censorship. Cybercrimes and enforcement agencies.			

<b>Course Outcomes:</b> On completion of this course, students will be able to,				
<ul style="list-style-type: none"> <li>• CO1: Have constitutional knowledge and legal literacy.</li> <li>• CO2: Understand Engineering and Professional ethics and responsibilities of Engineers.</li> <li>• CO3: Understand the the cybercrimes and cyber laws for cyber safety measures.</li> </ul>				
<b>Question paper pattern for SEE and CIE:</b>				
<ul style="list-style-type: none"> <li>• The SEE question paper will be set for 100 marks and the marks scored by the students will proportionately be reduced to 60. The pattern of the question paper will be objective type (MCQ).</li> <li>• For the award of 40 CIE marks, refer the University regulations 2018.</li> </ul>				
Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbooks</b>				
1	Constitution of India, Professional Ethics and Human Rights	Shubham Singles, Charles E. Haries, and et al	Cengage Learning India	2018
2	Cyber Security and Cyber Laws	Alfred Basta and et al	Cengage Learning India	2018
<b>Reference Books</b>				
3	Introduction to the Constitution of India	Durga Das Basu	Prentice –Hall,	2008.
4	Engineering Ethics	M. Govindarajan, S. Natarajan, V. S. Senthilkumar	Prentice –Hall,	2004

<b>HUMAN RESOURCE MANAGEMENT</b>			
<b>Course Code</b>	<b>22MBA21</b>	<b>CIE Marks</b>	<b>50</b>
<b>Teaching Hours/Week (L:P:SDA)</b>	<b>4:0:0</b>	<b>SEE Marks</b>	<b>50</b>
<b>Total Hours of Pedagogy</b>	<b>50</b>	<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>04</b>	<b>Exam Hours</b>	<b>03</b>
<p><b>Course Learning objectives:</b> The student will be able to</p> <ul style="list-style-type: none"> <li>• Recite the theories and various functions of Human Resources Management</li> <li>• Describe and explain in her/his own words, the relevance and importance of Human Resources Management at workplace</li> <li>• Apply and solve the workplace problems through Human Resources Management intervention</li> <li>• Compare and contrast different approaches of HRM for solving the complex issues and problems at the workplace</li> <li>• Design and develop an original framework and model in dealing with the problems in the organization.</li> </ul>			
<b>Module-1 (7 Hours)</b>			
<p><b>Introduction HRM:</b> Introduction, meaning, nature, scope of HRM, Importance and Evolution of the concept of HRM, Major functions of HRM, Principles of HRM. Human Resource Management and Personnel Management, Models of Human Resource Management, HRM in India, The Factors Influencing Human Resource Management, The HR Competencies, Human Resource Management and Firm Performance.</p>			
<b>Module-2 (9 Hours)</b>			
<p><b>HR Planning:</b> Importance of HR Planning, Manpower Planning to HR Planning, Factors Affecting HR Planning, Benefits of HR Planning, HRP Process, Tools for Demand Forecasting, Attributes of an Effective HR Planning, Barriers to HR Planning, The Challenges for HR, Process of Job Analysis, Job Description and Job Evaluation.</p> <p><b>Recruitment and Selection:</b> Importance of Recruitment, Recruitment Policies, Factors Influencing Recruitment, Recruitment Process, Sources, Evaluation of Recruitment Process, Recruitment Strategy, Future Trends in Recruitment; Selection Process; Selection Tests; Factors Influencing Selections.</p>			
<b>Module-3 (9 Hours)</b>			
<p><b>Performance Management and Appraisal:</b> Objectives of Performance Management, Performance Management and Performance Appraisal, Common Problems with Performance Appraisals, Performance Management Process, Types of Performance Rating Systems, Future of Performance Management.</p> <p><b>Compensation and Benefits:</b> Introduction, Definitions, Total Compensation, Total Rewards System, Forms of Pay, External and Internal Factors, Establishing Pay Rates, Employee Benefits.</p> <p><b>Industrial Relations:</b> Decent Workplace, International Labour Organisation, Industrial Relations, The Objectives of Industrial Relations, Approaches of Industrial Relations Systems, The Actors in Industrial Relations, Indian Context, Industrial Relations and Human Resource Management.</p>			
<b>Module-4 (9 Hours)</b>			

<p><b>Human Resource Management in Small and Medium Enterprises:</b> Introduction to SMEs, The Difference in Adoption of Human Resource Management, SMEs and Large Firms, Indian Experience, Impact of Weak Adoption of Human Resource Management in SMEs,</p> <p><b>Human Resource Management in the Service Sector:</b> Introduction, The Emergence of the Services Sector, Implications for Human Resource, Management Function, Differences Between Services Sector and the Manufacturing Sector, Difference in Human Resource Management in Services and Manufacturing Sectors, Human Resource Management and Service Quality Correlation, Trade Unions in Services Sector, Models of Union Strategies.</p>
<p><b>Module-5 (9 Hours)</b></p>
<p><b>Human Resource Management and Innovations:</b> Factors Affecting the Innovation Process in organisations, Current Trends in Human Resource Management, Innovative Human Resource Management Practices in India, Sustainable and innovative Human Resource Management.</p>
<p><b>Module-6 (7 Hours)</b></p>
<p><b>Future trends in Human Resource Management:</b> Hybrid work model, Employee skill development, Internal mobility, Diversity and inclusion in workforce, People analytics, Employee well-being, Multi-generational workforces and All-in-One HR tools.</p>
<p><b>Assessment Details (both CIE and SEE)</b></p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p><b>Continuous Internal Evaluation:</b></p> <p>There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.</p> <p><b>CIE Marks shall be based on:</b></p> <p>a) Tests (for 25Marks) and</p> <p>b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.</p> <p><b>Semester End Examination:</b></p> <p>The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.</p> <ul style="list-style-type: none"> <li>• The question paper will have 8 full questions carrying equal marks.</li> <li>• Each full question is for 20 marks with 3 sub questions.</li> <li>• Each full question will have sub question covering all the topics.</li> <li>• The students will have to answer five full questions; selecting four full questions from question number one to seven in the pattern of 3, 7 &amp; 10 Marks and question number eight is compulsory.</li> </ul>



<b>Universal Human Values (UHV)</b>		Semester	<b>3<sup>rd</sup></b>
Course Code	<b>BUHK408</b>	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	1:0:0:1	SEE Marks	50
Total Hours of Pedagogy	15 hour Theory Session +15 hour Self study	Total Marks	100
Credits	01	Exam Hours	01 Hour
Examination type (SEE)	SEE paper shall be set for 50 questions, each of the 01 mark. The pattern of the question paper is <b>MCQ (multiple choice questions)</b> .		

**Course objectives:**

This course is intended to:

- To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.
- This course is intended to provide a much-needed orientation input in value education to the young enquiring minds.

**Teaching-Learning Process (General Instructions)**

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. The methodology of this course is explorational and thus universally adaptable. It involves a systematic and rational study of the human being vis-à-vis the rest of existence.
2. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the activities will develop students’ theoretical and applied skills.
3. State the need for UHV activities and its present relevance in the society and Provide real-life examples.
4. Support and guide the students for self-study activities.
5. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students’ progress in real activities in the field.
6. This process of self-exploration takes the form of a dialogue between the teacher and the students to begin with, and then to continue within the student in every activity, leading to continuous selfevolution.
7. Encourage the students for group work to improve their creative and analytical skills.

**Module-1**

**Introduction to Value Education (3 hours)**  
 Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfil the Basic Human Aspirations

**Module-2**



<p><b>Harmony in the Human Being : (3 hours)</b>                  Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health</p>
<p><b>Module-3</b></p>
<p><b>Harmony in the Family and Society : (3 hours)</b>                  Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Other Feelings, Justice in Human-to-Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order</p>
<p><b>Module-4</b></p>
<p><b>Harmony in the Nature/Existence : (3 hours)</b>                  Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, The Holistic Perception of Harmony in Existence</p>
<p><b>Module-5</b></p>
<p><b>Implications of the Holistic Understanding – a Look at Professional Ethics : (3 hours)</b>                  Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value-based Life and Profession</p>
<p><b>Course outcome (Course Skill Set)</b>                  At the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature);</p> <ul style="list-style-type: none"> <li>• They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.</li> <li>• They would have better critical ability.</li> <li>• They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).</li> <li>• It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.</li> </ul> <p>Expected to positively impact common graduate attributes like:</p> <ol style="list-style-type: none"> <li>1. Ethical human conduct</li> <li>2. Socially responsible behaviour</li> <li>3. Holistic vision of life</li> <li>4. Environmentally responsible work</li> <li>5. Having Competence and Capabilities for Maintaining Health and Hygiene</li> <li>6. Appreciation and aspiration for excellence (merit) and gratitude for all</li> </ol>

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). The student is declared as a pass in the course if he/she secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

**Continuous internal Examination (CIE)**

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

**The sum of two tests, two assignments, will be out of 100 marks and will be scaled down to 50 marks**

**Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

**Semester End Examinations (SEE)**

SEE paper shall be set for **50 questions**, each of the 01 marks. **The pattern of the question paper is MCQ (multiple choice questions). The time allotted for SEE is 01 hour.** The student has to secure a minimum of 35% of the maximum marks meant for SEE.

**Suggested Learning Resources:**

**Books for READING:**

Text Book and Teachers Manual

- a. The Textbook A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
- b. The Teacher's Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G

**Reference Books**

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantik, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews

7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj – Pandit Sunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)
14. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
15. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome’s report, Universe Books.
16. A Nagraj, 1998, Jeevan Vidya Ek Parichay, Divya Path Sansthan, Amarkantak.
17. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
18. A N Tripathy, 2003, Human Values, New Age International Publishers.
19. SubhasPalekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) KrishiTantraShodh, Amravati.
20. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers , Oxford University Press
21. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd.
22. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.
23. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

**Web links and Video Lectures (e-Resources):**

- Value Education websites,
- <https://www.uhv.org.in/uhv-ii>,
- <http://uhv.ac.in>,
- <http://www.uptu.ac.in>
- Story of Stuff,
- <http://www.storyofstuff.com>
- Al Gore, An Inconvenient Truth, Paramount Classics, USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology – the Untold Story
- Gandhi A., Right Here Right Now, Cyclewala Productions
- [https://www.youtube.com/channel/UCQxWr5QB\\_eZUnwxSwxXEkQw](https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw)
- [https://fdp-si.aicte-india.org/8dayUHV\\_download.php](https://fdp-si.aicte-india.org/8dayUHV_download.php)
- <https://www.youtube.com/watch?v=8ovkLRYXIjE>
- <https://www.youtube.com/watch?v=OgdNx0X923I>
- <https://www.youtube.com/watch?v=nGRcbRpvGoU>
- <https://www.youtube.com/watch?v=sDxGXOgYEKM>

## III/IV Semester

<b>Constitution of India and Professional Ethics (CIP)</b>			
<b>Course Code</b>	<b>21CIP37/47</b>	<b>CIE Marks</b>	<b>50</b>
<b>Teaching Hours/Week (L:T:P: S)</b>	<b>L:0,T:2,P:0 = 02 Hours</b>	<b>SEE Marks</b>	<b>50</b>
<b>Total Hours of Pedagogy</b>	<b>02 Hours/Week</b>	<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>01</b>	<b>Exam Hours</b>	<b>01 Hours</b>
<p><b>Course objectives:</b> This course will enable the students</p> <ol style="list-style-type: none"> <li>To know about the basic structure of Indian Constitution.</li> <li>To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.</li> <li>To know about our Union Government, political structure &amp; codes, procedures.</li> <li>To know the State Executive &amp; Elections system of India.</li> <li>To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.</li> </ol>			
<p><b>Teaching-Learning Process</b>            These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching -Learning more effective: Teachers shall adopt suitable pedagogy for effective teaching - learning process. The pedagogy shall involve the combination of different methodologies which suit modern technological tools.</p> <p>(i) Direct instructional method ( Low/Old Technology), (ii) Flipped classrooms (High/advanced Technological tools), (iii) Blended learning (Combination of both), (iv) Enquiry and evaluation based learning, (v) Personalized learning, (vi) Problems based learning through discussion.</p> <p>Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adapted so that the delivered lesson can progress the students In theoretical applied and practical skills.</p>			
<b>Module - 1</b>			
<p><b>Introduction to Indian Constitution:</b> The Necessity of the Constitution, The Societies before and after the Constitution adoption. Introduction to the Indian constitution, The Making of the Constitution, The Role of the Constituent Assembly. The Preamble of Indian Constitution &amp; Key concepts of the Preamble. Salient features of India Constitution.</p>			
<b>Module - 2</b>			
<p><b>FR's, FD's and DPSP's:</b> Fundamental Rights and its Restriction and limitations in different Complex Situations. Directive Principles of State Policy (DPSP) and its present relevance in our society with examples. Fundamental Duties and its Scope and significance in Nation building.</p>			
<b>Module - 3</b>			
<p><b>Union Executive :</b> Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism.</p>			
<b>Module - 4</b>			
<p><b>State Executive &amp; Elections, Amendments and Emergency Provisions:</b> State Executive, Election Commission, Elections &amp; Electoral Process. Amendment to Constitution (How and Why) and Important Constitutional Amendments till today. Emergency Provisions.</p>			
<b>Module-5</b>			
<p><b>Professional Ethics:</b> Ethics &amp; Values. Types of Ethics. Scope &amp; Aims of Professional &amp; Engineering Ethics. Positive and Negative Faces of Engineering Ethics. Clash of Ethics, Conflicts of Interest. The impediments to Responsibility. Trust &amp; Reliability in Engineering, IPRs (Intellectual Property Rights), Risks, Safety and liability in Engineering.</p>			
<p><b>Course outcome (Course Skill Set) :</b>            At the end of the course the student will be able to :</p>			
C01	Analyse the basic structure of Indian Constitution.		
C02	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.		
C03	know about our Union Government, political structure & codes, procedures.		
C04	Understand our State Executive & Elections system of India.		
C05	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.		

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% ( 18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

**Continuous Internal Evaluation:**

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5<sup>th</sup> week of the semester
2. Second test at the end of the 10<sup>th</sup> week of the semester
3. Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4<sup>th</sup> week of the semester
5. Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be scaled down to 50 marks

**Total CIE : IA 20\*3=60, Assignment 10+10=20, Quiz 20 = 100 /2 = 50**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

**Semester End Examination:**

SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject **(duration 02 hours)**

1. The question paper will have 50 questions. Each question is set for 01 mark.
2. Semester End Exam (SEE) Pattern will be in MCQ Model (Multiple Choice Questions) for 50 marks (60 minutes duration).

**Suggested Learning Resources:****Textbook:**

1. **“Constitution of India” (for Competitive Exams)** - Published by Naidhruva Edutech Learning Solutions, Bengaluru. – 2022.
2. **“Engineering Ethics”**, M.Govindarajan, S.Natarajan, V.S.Senthilkumar, Prentice –Hall, 2004.

**Reference Books:**

1. **“Samvidhana Odu” - for Students & Youths by Justice HN Nagamohan Dhas, Sahayana, kerekon.**
2. **“Constitution of India, Professional Ethics and Human Rights”** by Shubham Singles, Charles E. Haries, and et al: published by Cengage Learning India, Latest Edition – 2019.
3. **“Introduction to the Constitution of India”, (Students Edition.) by Durga Das Basu (DD Basu):** Prentice –Hall, 2008.
4. **“The Constitution of India”** by Merunandan K B: published by Merugu Publication, Second Edition, Bengaluru.

12.01.2023

<b>Principles of Management and Organisational Behaviour</b>			
<b>Course Code</b>	<b>22MBA11</b>	<b>CIE Marks</b>	<b>50</b>
<b>Teaching Hours/Week (L:P:SDA)</b>	<b>4:0:0</b>	<b>SEE Marks</b>	<b>50</b>
<b>Total Hours of Pedagogy</b>	<b>50</b>	<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>04</b>	<b>Exam Hours</b>	<b>03</b>
<p><b>Course Objectives:</b> This course will enable the students</p> <ul style="list-style-type: none"> <li>• To understand theories and models of Management and OB.</li> <li>• To classify and differentiate between various methods of problem solving.</li> <li>• To compile an adept framework for solving the problems at the workplace.</li> <li>• To acquaint the students with industry relevant skill sets.</li> </ul>			
<b>Module-1 (8 Hours)</b>			
<p><b>Introduction:</b> Meaning, Objectives, Differences between Administration and Management, Levels of Management, Kinds of Managers, Managerial roles, History of Management, Recent trends in Management.</p>			
<b>Module-2 (9 Hours)</b>			
<p><b>Planning:</b> Importance, Process, Benefits of Planning, Types of Plans, Planning tools and techniques.  <b>Organising:</b> Meaning, Types of Organisation structures, Traditional structures, Directions in organisation structures.  <b>Leading:</b> Meaning, Nature, Traits and Behaviour, Contingency approaches to Leadership, Transformational leadership.  <b>Controlling:</b> Meaning, Importance, Steps in the control process, Types of Control.</p>			
<b>Module-3 (9 Hours)</b>			
<p><b>Organisational Behaviour:</b> Introduction, Meaning, History of Organisational Behaviour, Organisational effectiveness, Organisational learning process, Stakeholders, Contemporary challenges for Organisations.</p>			
<b>Module-4 (9 Hours)</b>			
<p><b>Behavioural Dynamics:</b> MARS Model of individual behaviour and performance, Types of Individual behaviour, Personality in Organisation, Values in the work place, Types of values, <b>Perception</b>, Meaning, Model of Perceptual process. Emotions in work place, Types of emotions, Circumplex Model of Emotion, Attitudes and Behaviour, Work-related stress and its management.  <b>Motivation</b>, Meaning, Maslow's Hierarchy of Needs, Four Drive Theory of Motivation.</p>			
<b>Module-5 (9 Hours)</b>			
<p><b>Teams:</b> Advantages of Teams, Model of Team Effectiveness, Stages of Team Development. Power , Meaning, Sources, and Contingencies of Power, Consequences of Power.</p>			
<b>Module-6 (7 Hours)</b>			

<b>HUMAN RESOURCE MANAGEMENT</b>			
<b>Course Code</b>	<b>22MBA21</b>	<b>CIE Marks</b>	<b>50</b>
<b>Teaching Hours/Week (L:P:SDA)</b>	<b>4:0:0</b>	<b>SEE Marks</b>	<b>50</b>
<b>Total Hours of Pedagogy</b>	<b>50</b>	<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>04</b>	<b>Exam Hours</b>	<b>03</b>
<p><b>Course Learning objectives:</b> The student will be able to</p> <ul style="list-style-type: none"> <li>• Recite the theories and various functions of Human Resources Management</li> <li>• Describe and explain in her/his own words, the relevance and importance of Human Resources Management at workplace</li> <li>• Apply and solve the workplace problems through Human Resources Management intervention</li> <li>• Compare and contrast different approaches of HRM for solving the complex issues and problems at the workplace</li> <li>• Design and develop an original framework and model in dealing with the problems in the organization.</li> </ul>			
<b>Module-1 (7 Hours)</b>			
<p><b>Introduction HRM:</b> Introduction, meaning, nature, scope of HRM, Importance and Evolution of the concept of HRM, Major functions of HRM, Principles of HRM. Human Resource Management and Personnel Management, Models of Human Resource Management, HRM in India, The Factors Influencing Human Resource Management, The HR Competencies, Human Resource Management and Firm Performance.</p>			
<b>Module-2 (9 Hours)</b>			
<p><b>HR Planning:</b> Importance of HR Planning, Manpower Planning to HR Planning, Factors Affecting HR Planning, Benefits of HR Planning, HRP Process, Tools for Demand Forecasting, Attributes of an Effective HR Planning, Barriers to HR Planning, The Challenges for HR, Process of Job Analysis, Job Description and Job Evaluation.</p> <p><b>Recruitment and Selection:</b> Importance of Recruitment, Recruitment Policies, Factors Influencing Recruitment, Recruitment Process, Sources, Evaluation of Recruitment Process, Recruitment Strategy, Future Trends in Recruitment; Selection Process; Selection Tests; Factors Influencing Selections.</p>			
<b>Module-3 (9 Hours)</b>			
<p><b>Performance Management and Appraisal:</b> Objectives of Performance Management, Performance Management and Performance Appraisal, Common Problems with Performance Appraisals, Performance Management Process, Types of Performance Rating Systems, Future of Performance Management.</p> <p><b>Compensation and Benefits:</b> Introduction, Definitions, Total Compensation, Total Rewards System, Forms of Pay, External and Internal Factors, Establishing Pay Rates, Employee Benefits.</p> <p><b>Industrial Relations:</b> Decent Workplace, International Labour Organisation, Industrial Relations, The Objectives of Industrial Relations, Approaches of Industrial Relations Systems, The Actors in Industrial Relations, Indian Context, Industrial Relations and Human Resource Management.</p>			
<b>Module-4 (9 Hours)</b>			



<p><b>Human Resource Management in Small and Medium Enterprises:</b> Introduction to SMEs, The Difference in Adoption of Human Resource Management, SMEs and Large Firms, Indian Experience, Impact of Weak Adoption of Human Resource Management in SMEs,</p> <p><b>Human Resource Management in the Service Sector:</b> Introduction, The Emergence of the Services Sector, Implications for Human Resource, Management Function, Differences Between Services Sector and the Manufacturing Sector, Difference in Human Resource Management in Services and Manufacturing Sectors, Human Resource Management and Service Quality Correlation, Trade Unions in Services Sector, Models of Union Strategies.</p>
<p><b>Module-5 (9 Hours)</b></p> <p><b>Human Resource Management and Innovations:</b> Factors Affecting the Innovation Process in organisations, Current Trends in Human Resource Management, Innovative Human Resource Management Practices in India, Sustainable and innovative Human Resource Management.</p>
<p><b>Module-6 (7 Hours)</b></p> <p><b>Future trends in Human Resource Management:</b> Hybrid work model, Employee skill development, Internal mobility, Diversity and inclusion in workforce, People analytics, Employee well-being, Multi-generational workforces and All-in-One HR tools.</p>
<p><b>Assessment Details (both CIE and SEE)</b></p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p><b>Continuous Internal Evaluation:</b></p> <p>There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.</p> <p><b>CIE Marks shall be based on:</b></p> <ol style="list-style-type: none"> <li>Tests (for 25Marks) and</li> <li>Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.</li> </ol> <p><b>Semester End Examination:</b></p> <p>The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.</p> <ul style="list-style-type: none"> <li>The question paper will have 8 full questions carrying equal marks.</li> <li>Each full question is for 20 marks with 3 sub questions.</li> <li>Each full question will have sub question covering all the topics.</li> <li>The students will have to answer five full questions; selecting four full questions from question number one to seven in the pattern of 3, 7 &amp; 10 Marks and question number eight is compulsory.</li> </ul>

<b>HR Analytics</b>			
Course Code	<b>22MBABA404</b>	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	2:2:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
<b>Course Learning objectives:</b>			
<ul style="list-style-type: none"> <li>To introduce the student to the theory, concepts, and business application of human resources research, data, metrics, systems, analyses, and reporting.</li> <li>To develop an understanding of the role and importance of HR analytics, and the ability to track, store, retrieve, analyse and interpret HR data to support decision making.</li> <li>To aware the challenges human resources analytics for the competitive advantage of the organization.</li> <li>To enable students to use applicable benchmarks/metrics to conduct research and statistical analyses related to Human Resource Management.</li> </ul>			
<b>Module-1                  6 Hours</b>			
HR Analytics in Perspective: Role of Analytics, Defining HR Analytics, HR Analytics: The Third Wave for HR value creation, HR Measurement journey in tune with HR maturity journey Understanding the organizational system (Lean), Locating the HR challenge in the system , Valuing HR Analytics in the organizational system.			
<b>Module-2                  6 Hours</b>			
<b>HRA Frameworks:</b> Current approaches to measuring HR and reporting value from HR contributions, Strategic HR Metrics versus Benchmarking, HR Scorecards & Workforce Scorecards and how they are different from HR Analytics, HR Maturity Framework: From level 1 to level 5, HR Analytics Frameworks: (a) LAMP framework; (b) HCM:21 Framework and (c) Talentship			
<b>Module-3                  7 Hours</b>			
<b>Basics of HR Analytics:</b> Basics of HR Analytics, what is Analytics, Evolution, Analytical capabilities, Analytic value chain, Analytical Model, Typical application of HR analytics. <b>Predictive Analytics:</b> Steps involved in predictive analytics: Determine key performance indicator, analyse and report data, interpreting the results and predicting the future. Metrics and Regression analysis and Causation.			
<b>Module-4                  7 Hours</b>			
<b>Insight into Data Driven HRA:</b> Typical data sources, Typical questions faced (survey), Typical data issues, Connecting HR Analytics to business benefit (case studies), Techniques for establishing questions, Building support and interest, Obtaining data, Cleaning data (exercise), Supplementing data.			
<b>Module-5                  7 Hours</b>			
<b>HR Metrics –</b> Defining metrics, Demographics, data sources and requirements, Types of data, tying data sets together, Difficulties in obtaining data, <b>ethics of measurement and evaluation</b> . Human capital analytics continuum. HR Dashboards. Statistical software used for HR analytics: MS-Excel, IBM-SPSS, IBMAMOS, SAS, and R programming and data visualisation tools such as Tableau, Plotly, Click view and Fusion Charts.			
<b>Module-6                  7 Hours</b>			

**HR Scorecard:** Assessing HR Program, engagement and Turnover, Finding money in Analytics, Linking HR Data to operational performance, HR Data and stock performance. Creating HR Scorecard, develop an HR measurement system, guidelines for implementing a HR Scorecard.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation:**

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

**CIE Marks shall be based on:**

- a) Tests (for 25Marks) and
- b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

**Semester End Examination:**

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

- The question paper will have 8 full questions carrying equal marks.
- Each full question is for 20 marks with 3 sub questions.
- Each full question will have sub question covering all the topics.
- The students will have to answer five full questions; selecting four full questions from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.
- No Laboratory exam for this course.

<b>INTEGRATED MARKETING COMMUNICATIONS</b>			
<b>Course Code</b>	<b>22MBAMM404</b>	<b>CIE Marks</b>	<b>50</b>
<b>Teaching Hours/Week (L:P:SDA)</b>	<b>2:2:0</b>	<b>SEE Marks</b>	<b>50</b>
<b>Total Hours of Pedagogy</b>	<b>40</b>	<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>03</b>	<b>Exam Hours</b>	<b>03</b>
<p><b>Course Learning objectives:</b></p> <ul style="list-style-type: none"> <li>• To build a comprehensive framework for integrated marketing communications.</li> <li>• To the study the advertising, publicity, personal selling, direct marketing and sales promotion.</li> <li>• To enhance knowledge of emerging trends in integrated marketing communications.</li> <li>• To acquaint the students with the latest internet and e-marketing techniques, ethically way of handling business.</li> </ul>			
<b>Module-1 (6 Hours)</b>			
<p><b>Integrated Marketing Communication:</b> Role of IMC in marketing process, IMC planning model, Marketing and promotion Process model.  <b>Communication Process,</b> steps involved in developing IMC programme, Effectiveness of marketing communications  <b>Advertising:</b> Purpose, Role, Functions, Types, Advertising Vs Marketing mix, Advertising appeal in various stages of PLC  <b>Relevant Case Study</b></p>			
<b>Module-2 (6 Hours)</b>			
<p><b>Advertising Agency:</b> Type of agencies, Services offered by various agencies, Criteria For selecting the agencies and evaluation.  <b>Advertising objectives and Budgeting:</b> Goal setting – DAGMAR approach, various budgeting methods used.  <b>Relevant Case Study</b></p>			
<b>Module-3 (7 Hours)</b>			
<p><b>Media planning:</b> Factors considered in Media Planning, Developing Media plan, Importance, Problems encountered, Advertising Media, Media Evaluation-Print, Broadcast media, Support media in advertising.  <b>Media strategy:</b> Creativity, Elements of creative strategies and its implementation, Importance of Headline and body copy.  <b>Relevant Case Study</b></p>			
<b>Module-4 (7 Hours)</b>			
<p><b>Direct Marketing:</b> Features, Functions, Growth, Advantages/Disadvantages, And Direct Marketing Strategies.  <b>Promotion:</b> Meaning, Importance, tools used, Conventional/unconventional, drawbacks, push pull strategies, Co-operative advertising, Integration with advertising and publicity  <b>Public relation/ Publicity:-</b>Meaning, Objectives, tools of public relations, Public Relation strategies, Goals of publicity  <b>Corporate Advertising –</b> Role, Types, Limitations, PR Vs Publicity  <b>Relevant Case Study</b></p>			

<p><b>Module-5 (7 Hours)</b></p> <p><b>Monitoring, Evaluation and control:</b> Measurement in advertising, various methods used for evaluation, Pre-testing, Post testing.</p> <p><b>Relevant Case Study</b></p>
<p><b>Module-6 (7 Hours)</b></p> <p><b>International Advertising:</b> Global environment in advertising, Decision areas in international advertising.</p> <p><b>Industrial advertising:</b> B 2 B Communication, Special issues in Industrial selling.</p> <p><b>Internet advertising:</b> Meaning, Components, Advantages and Limitations, Types of Internet advertising</p> <p><b>Advertising Laws &amp; Ethics:</b> Advertising &amp; Law, Advertising &amp; Ethics, Pester Power, Intellectual Property Rights, ASCI</p> <p><b>Relevant Case Study</b></p>
<p><b>Assessment Details (both CIE and SEE)</b></p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p><b>Continuous Internal Evaluation:</b></p> <p>There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.</p> <p><b>CIE Marks shall be based on:</b></p> <p>a) Tests (for 25Marks) and</p> <p>b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.</p> <p><b>Semester End Examination:</b></p> <p>The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.</p> <ul style="list-style-type: none"> <li>• The question paper will have 8 full questions carrying equal marks.</li> <li>• Each full question is for 20 marks with 3 sub questions.</li> <li>• Each full question will have sub question covering all the topics.</li> <li>• The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 &amp; 10 Marks and question number eight is compulsory.</li> </ul>

V Semester

<b>Hydrology and Water Resource Engineering</b>			
Course Code	<b>21CV51</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3+0+0+0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	3	Exam Hours	3
<p><b>Course objectives: Make the students to learn</b></p> <ol style="list-style-type: none"> <li>1. Concept of hydrology, components of hydrologic cycle, hydrologic processes such as precipitation, infiltration, evaporation and transpiration.</li> <li>2. Estimation of runoff and use the concept of unit hydrograph.</li> <li>3. Systems and methods of irrigation, crop water requirement.</li> <li>4. Canals, canal alignment, design methods of canals. Computation of reservoir capacity.</li> <li>5. Concepts of floods and droughts, importance of water conservation and water management.</li> </ol>			
<p><b>Teaching-Learning Process (General Instructions)</b>            These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>1. Power point Presentation</li> <li>2. Video tube, NPTEL materials</li> <li>3. Quiz/Assignments/Open book test to develop skills</li> <li>4. Adopt problem based learning (PBL)to develop analytical and thinking skills</li> <li>5. Encourage collaborative learning, site visits related to subject and impart practical knowledge</li> <li>6. Mini projects</li> </ol>			
<b>Module-1</b>			
<p><b>Hydrology:</b> Introduction, Global distribution of water and Indian water availability. Hydrologic cycle (Horton's) qualitative and engineering representation.  <b>Precipitation:</b> Forms and types, measurement of rain fall using Syphon type of rain gauges, optimum number of rain gauge stations, consistency of rainfall data (double mass curve method), computation of mean rainfall, estimation of missing data, presentation of precipitation data, moving average curve, mass curve, rainfall hyetographs.  <b>Losses from Precipitation:</b> Evaporation process, factors affecting evaporation, measurement using IS class-A Pan, reservoir evaporation and control. Factors affecting Evapo-transpiration. Infiltration, Factors affecting infiltration capacity, measurement by double ring infiltrometer, Horton's infiltration equation, infiltration indices.</p>			<b>8 hours</b>
<b>Teaching-Learning Process</b>	Chalk and talk, Power Point Presentation& PBL		
<b>Module-2</b>			
<p><b>Runoff:</b> Definition, concept of catchment, factors affecting runoff, rainfall - runoff relationship using regression analysis.  <b>Hydrographs:</b> Definition, components of hydrograph, base flow separation, unit hydrograph, assumption, application and limitations, derivation from simple storm hydrographs, S curve and its computations, Conversion of UH of different durations.</p>			<b>8 hours</b>
<b>Teaching-Learning Process</b>	Chalk and talk, Power Point Presentation & PBL		
<b>Module-3</b>			
<p><b>Irrigation:</b> System of irrigation: surface and ground water, flow irrigation, lift irrigation. Methods of irrigation: surface, sprinkler and drip/micro irrigation.  <b>Water Requirements of Crops:</b> Duty, delta and base period, relationship between them, factors affecting duty of water crops and crop seasons in India, irrigation efficiency, frequency of irrigation.</p>			<b>8 hours</b>
<b>Teaching-Learning Process</b>	Chalk and talk, PowerPoint Presentation and Model preparation		
<b>Module-4</b>			

<p><b>Canals:</b> Types of canals. Alignment of canals. Definition of gross command area, cultural command area, intensity of irrigation, time factor, crop factor. Unlined and lined canals. Standard sections. Regime channels, Design of canals by Lacey's and Kennedy's method (No numerical examples).</p> <p><b>Reservoirs:</b> Definition, investigation for reservoir site, storage zones determination of storage capacity using mass curves, economical height of dam.</p>	8 hours
<b>Teaching-Learning Process</b>	Chalk and talk, Power Point Presentation and Field visits.
<b>Module-5</b>	
<p><b>Flood Management:</b> Indian rivers and floods, Causes of floods, Alleviation, Levees and floodwalls, Flood ways, Channel improvement, Flood damage analysis.</p> <p><b>Drought Management:</b> Definition of drought, Causes of drought, measures for water conservation and augmentation, drought contingency planning.</p> <p><b>Water harvesting:</b> rainwater collection, small dams, runoff enhancement, runoff collection, Restoration and rejuvenation of water bodies ( ponds and lakes)</p>	8 hours
<b>Teaching-Learning Process</b>	Chalk and talk, Power Point Presentation and Mini-projects
<p><b>Course outcome (Course Skill Set)</b></p> <p>At the end of the course the student will be able to :</p> <ol style="list-style-type: none"> <li>1. Provide a background in the theory of hydrological processes and their measurement</li> <li>2. Estimate runoff and develop unit hydrographs.</li> <li>3. Find the water requirement and frequency of irrigation for various crops.</li> <li>4. Find the canal capacity and compute the reservoir capacity.</li> <li>5. Analyse floods and droughts. Emphasise on the importance of conservation of water and water bodies.</li> </ol>	



## V Semester

<b>Environmental Studies</b>			
Course Code	<b>21CIV57</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	1+2+0+0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	01
<b>Course objectives:</b>			
<ul style="list-style-type: none"> <li>To create environmental awareness among the students.</li> <li>To gain knowledge on different types of pollution in the environment.</li> </ul>			
<b>Teaching-Learning Process (General Instructions)</b>			
These are sample Strategies; which teacher can use to accelerate the attainment of the various course outcomes.			
<ol style="list-style-type: none"> <li>Apart from conventional lecture methods various types of innovative teaching techniques through videos, and animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills.</li> <li>Environmental awareness program for the in house campus</li> <li>Encourage collaborative (Group Learning) Learning in the class.</li> <li>Seminars, surprise tests and Quizzes may be arranged for students in respective subjects to develop skills.</li> </ol>			
<b>Module-1</b>			
Ecosystems (Structure and Function): Forest, Desert, Wetlands, River, Oceanic and Lake. Biodiversity: Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.			
<b>Teaching-Learning Process</b>	Chalk and talk, PowerPoint presentation and animation tools		
<b>Module-2</b>			
Advances in Energy Systems (Merits, Demerits, Global Status and Applications): Hydrogen, Solar, OTEC, Tidal and Wind. Natural Resource Management (Concept and case-studies): Disaster Management, Sustainable Mining, case studies, and Carbon Trading.			
<b>Teaching-Learning Process</b>	Chalk and talk, powerpoint presentation and animation tools		
<b>Module-3</b>			
<b>Environmental Pollution</b> (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution. <b>Waste Management &amp; Public Health Aspects:</b> Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge.			
<b>Teaching-Learning Process</b>	Chalk and talk, powerpoint presentation and animation tools		
<b>Module-4</b>			
<b>Global Environmental Concerns</b> (Concept, policies and case-studies): Ground water depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride problem in drinking water; Resettlement and rehabilitation of people, Environmental Toxicology.			
<b>Teaching-Learning Process</b>	Chalk and talk, powerpoint presentation and animation tools		

<b>Module-5</b>	
<p><b>Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications):</b> G.I.S. &amp; Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs. Field work: Visit to an Environmental Engineering Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant; ought to be Followed by understanding of process and its brief documentation.</p>	
<b>Teaching-Learning Process</b>	Chalk and talk, power point presentation and animation tools
<p><b>Course outcome (Course Skill Set)</b></p> <p>At the end of the course the student will be able to :</p> <ul style="list-style-type: none"> <li>• CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,</li> <li>• CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.</li> <li>• CO3: Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.</li> <li>• • CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.</li> </ul>	
<p><b>Assessment Details (both CIE and SEE)</b></p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together</p> <p><b>Continuous Internal Evaluation:</b></p> <p>Three Unit Tests each of <b>20 Marks (duration 01 hour)</b></p> <ol style="list-style-type: none"> <li>1. First test at the end of 5<sup>th</sup> week of the semester</li> <li>2. Second test at the end of the 10<sup>th</sup> week of the semester</li> <li>3. Third test at the end of the 15<sup>th</sup> week of the semester</li> </ol> <p>Two assignments each of <b>10 Marks</b></p> <ol style="list-style-type: none"> <li>4. First assignment at the end of 4<sup>th</sup> week of the semester</li> <li>5. Second assignment at the end of 9<sup>th</sup> week of the semester</li> </ol> <p>Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for <b>20 Marks (duration 01 hours)</b></p> <ol style="list-style-type: none"> <li>6. At the end of the 13<sup>th</sup> week of the semester</li> </ol> <p>The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be <b>scaled down to 50 marks</b></p> <p>(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).</p> <p><b>CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</b></p> <p><b>Semester End Examination:</b></p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (<b>duration 01 hours</b>)</p> <p>Question paper pattern:</p> <ol style="list-style-type: none"> <li>1. The Question paper will have 50 objective questions.</li> </ol>	

2. Each question will be for 01 marks
3. Students will have to answer all the questions on an OMR Sheet.
4. The Duration of the Exam will be 01 hour

**Suggested Learning Resources:**

**Books**

- Environmental studies, Benny Joseph, Tata Mcgraw-Hill 2<sup>nd</sup> edition 2012
- Environmental studies, S M Prakash, pristine publishing house, Mangalore 3<sup>rd</sup> edition-2018

**Reference Books: -**

- Benny Joseph, Environmental studies, Tata Mcgraw-Hill 2<sup>nd</sup> edition 2009
- M.Ayi Reddy Textbook of environmental science and Technology, BS publications 2007
- Dr. B.S Chauhan, Environmental studies, university of science press 1<sup>st</sup> edition

**Web links and Video Lectures (e-Resources):**

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**Activity-Based Learning (Suggested Activities in Class)/ Practical Based learning**

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B. E. MECHANICAL ENGINEERING				
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)				
SEMESTER – V				
ENVIRONMENTAL STUDIES				
Course Code	18CIV59	CIE Marks	40	
Teaching Hours / Week (L:T:P)	(1:0:0)	SEE Marks	60	
Credits	01	Exam Hours	02	
<b>Module - 1</b>				
<b>Ecosystems</b> (Structure and Function): Forest, Desert, Wetlands, Riverine, Oceanic and Lake. 02 Hrs				
<b>Biodiversity:</b> Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.				
<b>Module - 2</b>				
<b>Advances in Energy Systems</b> (Merits, Demerits, Global Status and Applications): Hydrogen, Solar, OTEC, Tidal and Wind. 02 Hrs				
<b>Natural Resource Management</b> (Concept and case-studies): Disaster Management, Sustainable Mining, Cloud Seeding, and Carbon Trading.				
<b>Module - 3</b>				
<b>Environmental Pollution</b> (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution.02 Hrs				
<b>Waste Management &amp; Public Health Aspects:</b> Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge.				
<b>Module - 4</b>				
<b>Global Environmental Concerns</b> (Concept, policies and case-studies): Ground water depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride problem in drinking water; Resettlement and rehabilitation of people, Environmental Toxicology.				
<b>Module - 5</b>				
<b>Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications):</b> G.I.S. & Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs. 03 Hrs				
<b>Field work:</b> Visit to an Environmental Engineering Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant; ought to be Followed by understanding of process and its brief documentation.				
<b>Course Outcomes:</b> At the end of the course, students will be able to:				
<ul style="list-style-type: none"> <li>• CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,</li> <li>• CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.</li> <li>• CO3: Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.</li> <li>• CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.</li> </ul>				
<b>Question paper pattern:</b>				
<ul style="list-style-type: none"> <li>• The Question paper will have 100 objective questions.</li> <li>• Each question will be for 01 marks</li> <li>• Student will have to answer all the questions in an OMR Sheet.</li> <li>• The Duration of Exam will be 2 hours.</li> </ul>				
Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook/s</b>				
1	Environmental Studies	Benny Joseph	Tata Mc Graw – Hill.	2 <sup>nd</sup> Edition, 2012

2.	Environmental Studies	S M Prakash	Pristine Publishing House, Mangalore	3 <sup>rd</sup> Edition' 2018
3	Environmental Studies – From Crisis to Cure	R Rajagopalan	Oxford Publisher	2005
<b>Reference Books</b>				
1	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning, Singapur.	2 <sup>nd</sup> Edition, 2005
2	Environmental Science – working with the Earth	G.Tyler Miller Jr.	Thomson Brooks /Cole,	11 <sup>th</sup> Edition, 2006
3	Text Book of Environmental and Ecology	Pratiba Sing, AnoopSingh& Piyush Malaviya	Acme Learning Pvt. Ltd. New Delhi.	1 <sup>st</sup> Edition

<b>B. E. MECHANICAL ENGINEERING</b>			
<b>Choice Based Credit System (CBCS) and Outcome Based Education (OBE)</b>			
Open Elective-B (Semester VII)			
<b>ENERGY AND ENVIRONMENT</b>			
Course Code	<b>18ME751</b>	CIE Marks	40
Teaching Hours / Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
<b>Course Learning Objectives:</b>			
<ul style="list-style-type: none"> <li>To understand the fundamentals of energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies.</li> <li>To introduce various aspects of environmental pollution and its control.</li> <li>To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc.</li> <li>To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.</li> </ul>			
<b>Module-1</b>			
Basic Introduction to Energy: Energy and power, forms of energy, primary energy sources, energy flows, world energy production and consumption, Key energy trends in India: Demand, Electricity, Access to modern energy, Energy production and trade, Factors affecting India's energy development: Economy and demographics Policy and institutional framework, Energy prices and affordability, Social and environmental aspects, Investment.			
<b>Module-2</b>			
Energy storage systems: Thermal energy storage methods, Energy saving, Thermal energy storage systems Energy Management: Principles of Energy Management, Energy demand estimation, Energy pricing Energy Audit: Purpose, Methodology with respect to process Industries, Characteristic method employed in Certain Energy Intensive Industries			
<b>Module-3</b>			
Environment: Introduction, Multidisciplinary nature of environmental studies- Definition, scope and importance, Need for public awareness. Ecosystem: Concept, Energy flow, Structure and function of an ecosystem. Food chains, food webs and ecological pyramids, Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystems, Ecological succession.			
<b>Module-4</b>			
Environmental Pollution: Definition, Cause, effects and control measures of - Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution and Nuclear hazards, Solid waste Management, Disaster management Role of an individual in prevention of pollution, Pollution case studies.			
<b>Module-5</b>			
Social Issues and the Environment: Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation, Consumerism and waste products, 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.			
<b>Group assignments:</b>			
Assignments related to e-waste management; Municipal solid waste management; Air pollution control systems; Water treatment systems; Wastewater treatment plants; Solar heating systems; Solar power plants; Thermal power plants; Hydroelectric power plants; Biofuels; Environmental status assessments; Energy status assessments etc.			
<b>Course Outcomes:</b> At the end of the course, the student will be able to:			

CO1: Understand energy scenario, energy sources and their utilization.  
 CO2: Understand various methods of energy storage, energy management and economic analysis.  
 CO3: Analyse the awareness about environment and eco system.  
 CO4: Understand the environment pollution along with social issues and acts.

**Question paper pattern:**

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook/s</b>				
1	Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education		University grant commission and Bharathi Vidyapeeth Institute of environment education and Research, Pune	
2	Energy Management Audit & Conservation- for Module 2	Barun Kumar De	Vrinda Publication	2nd Edition 2010
<b>Reference Books</b>				
1	Energy Management Hand book	Turner, W. C., Doty, S. and Truner, W. C	Fairmont Press	7 <sup>th</sup> Edition 2009
2	Energy Management	Murphy, W. R	Elsevier	2007
3	Energy Management Principles	Smith, C. B	Pergamum	2007
4	Environment pollution control Engineering	C S Rao	New Age International	reprint 2015, 2nd edition
5	Environmental studies	Benny Joseph	Tata McGraw Hill	2nd edition 2008



VI Semester -

<b>CONCRETE TECHNOLOGY</b>			
Course Code	<b>21CV62</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2+2+2	SEE Marks	50
Total Hours of Pedagogy	50	Total Marks	100
Credits	4	Exam Hours	3
<p><b>Course objectives:</b></p> <ol style="list-style-type: none"> <li>1. To recognize material characterization of ingredients of concrete and its influence on properties of concrete</li> <li>2. Proportion ingredients of Concrete to arrive at most desirable mechanical properties of Concrete.</li> <li>3. Ascertain and measure engineering properties of concrete in fresh and hardened state which meet the requirement of real time structures.</li> </ol>			
<p><b>Teaching-Learning Process (General Instructions)</b>                      These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>1. Blackboard teaching/PowerPoint presentations (if needed)</li> <li>2. Regular review of students by asking questions based on topics covered in the class.</li> </ol>			
<b>MODULE-1</b>			
<p><b>CEMENT AND AGGREGATES</b>                      Cement, Chemical composition, Physical and chemical properties, Other Cementitious materials and composition -GGBS, Fly ash rice Husk ash, Silica fume, Hydration of cement, Factors influencing and affecting Hydration of cement, Types of cement. Fine aggregate - grading, analysis, Specific gravity, bulking, moisture content, deleterious materials.                      Coarse aggregate – Importance of size, shape and texture. Grading of aggregates - Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests. Codal Provisions.</p>			
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1.Blackboard teaching/PowerPoint presentations (if needed)</li> <li>2.Regular review of students by asking questions based on topics covered in the class.</li> </ol>		
<b>MODULE-2</b>			
<p><b>FRESH PROPERTIES OF CONCRETE</b>                      Workability - Process of manufactures of concrete: Batching, Mixing, Assessment of Workability of Concrete, Factors affecting workability, Measurement of workability – slump test, flow test, Compaction factor test and Vee-Bee Consistometer tests, Segregation and bleeding, Transporting, Placing, Compaction, Curing, need and Types of curing, accelerated curing.</p>			
<b>Teaching-Learning Process</b>	<ol style="list-style-type: none"> <li>1.Blackboard teaching/PowerPoint presentations (if needed)</li> <li>2.Regular review of students by asking questions based on topics covered in the class.</li> </ol>		
<b>MODULE-3</b>			
<p><b>ADMIXTURES:</b> Classification, effect on fresh and hardened concrete, retention time, Dosage ant their effects, Influence on properties of paste, mortar, and concrete Types of concrete (in brief).  <b>MIX DESIGN PROCEDURE:</b> Concept of Concrete Mix design, variables in proportioning, exposure conditions, Procedure of mix design as per IS 10262-2019, Numerical examples of Mix Design. Highlights of Other methods of Mix Design as per other codes.</p>			

<b>Teaching-Learning Process</b>	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.
<b>MODULE-4</b>	
<b>HARDENED CONCRETE:</b> Factors affecting strength, w/c ratio, gel/space ratio, maturity concept, Effect of aggregate properties, assessment of compressive strength, flexural strength, tensile strength, bond strength and modulus of elasticity, aggregate - cement bond strength, factors influencing strength and codal provisions, Relation between modulus of elasticity and strength, factors affecting modulus of elasticity, Poisson Ratio.	
<b>Teaching-Learning Process</b>	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.
<b>MODULE 5</b>	
<b>Durability</b> - definition, significance, short term and long-term durability. Shrinkage - plastic shrinkage and drying shrinkage, Factors contributing to cracks in concrete - plastic shrinkage, settlement cracks, Factors affecting shrinkage, Effect of creep. Measurement of creep, factors influencing creep. Permeability, Sulphate attack, Chloride attack, carbonation, freezing and thawing, Construction joints and Expansion joints, Thermal effect of concrete. Codal Provisions.	
<b>Teaching-Learning Process</b>	1.Blackboard teaching/PowerPoint presentations (if needed) 2.Regular review of students by asking questions based on topics covered in the class.

#### PRACTICAL COMPONENT OF IPCC

Sl.NO	Experiments
1	Testing of cement: Consistency, fineness, setting time, Specific Gravity, Soundness and strength.
2	Testing of fine aggregate: Specific Gravity, sieve analysis and zoning, bulking of fine aggregate, bulk density, silt content.
3	Testing of coarse aggregate: Specific Gravity, sieve analysis, bulk density, flakiness index, elongation index, water absorption & moisture content, soundness of aggregate.
4	Concrete Mix design by ACI 211.1-91 method, IS code method as per 10262- 2019 & 456-2000, DOE method
5	Tests on Concrete- Workability tests – Slump cone test, compaction factor test, Vee-bee consistometer test, flow table test, strength tests- compressive strength, flexural strength, split tensile strength
6	Effects of Admixture - Accelerator, Retarder, Super Plasticizer
7	Non-destructive Testing - Rebound Hammer test, Ultrasonic Pulse Velocity test
<b>Course outcomes (Course Skill Set):</b> At the end of the course the student will be able to: 1. Assess and infer various properties of cement, cementitious materials, Fine and coarse aggregate as per codal provision and specifications (L2) 2. Design the concrete mix for the given materials as per IS:10262-2019 provisions (L4) 3. Understand the manufacturing process and asses the quality of green (L2)	

4. Describe the properties of fresh and hardened concrete – Strength and Durability aspects (L3)

5. Examine and Evaluate properties of Cement and Concrete

### **Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

#### **CIE for the theory component of IPCC**

Two Tests each of **20 Marks (duration 01 hour)**

- First test at the end of 5<sup>th</sup> week of the semester
- Second test at the end of the 10<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

- First assignment at the end of 4<sup>th</sup> week of the semester
- Second assignment at the end of 9<sup>th</sup> week of the semester

Scaled-down marks of two tests and two assignments added will be CIE marks for the theory component of IPCC for **30 marks**.

#### **CIE for the practical component of IPCC**

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 02/03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to 05 marks.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **20 marks**.

#### **SEE for IPCC**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.

**The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from**

**the practical component).**

- The minimum marks to be secured in CIE to appear for SEE shall be the 12 (40% of maximum marks-30) in the theory component and 08 (40% of maximum marks -20) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than the 20 marks.
- SEE will be conducted for 100 marks and students shall secure 35% of the maximum marks to qualify in the SEE. Marks secured will be scaled down to 50.

**Suggested Learning Resources:**

**Books**

- 1.M.S.Shetty , "Concrete Technology" - Theory and Practice, , S.Chand and Company, New Delhi, 2002.
2. Concrete Technology (Trade, Technology & Industry), George White, Delmar Pu
- 3.Concrete: Microstructure, Properties, and Materials, P. Kumar Mehta , Paulo J. M. Monteiro, McGraw-Hill Education
- 4.Neville, A.M. , Properties of Concrete": , ELBS, London
- 5.A.R.Santakumar , "Concrete Technology" –. Oxford University Press (2007)'
- 6.Advanced Concrete Technology, Zongjin Li, Wiley; 1 edition
- 7.GambhirDhanpatRai&Sons , "Concrete Manual" -, New Delhi
- 8.N.KrishnaRaju, "Concrete Mix Design" -, Sehgal - publishers
- 9.IS:10262-2016 , "Recommended guidelines for concrete mix design", Bureau of Indian Standards, New Delhi

**Web links and Video Lectures (e-Resources):**

Cement <https://nptel.ac.in/courses/105102012/1>  
Aggregates <https://nptel.ac.in/courses/105102012/6>  
Mineral admixtures<https://nptel.ac.in/courses/105102012/11>  
Chemical admixtures <https://nptel.ac.in/courses/105102012/9>  
<https://nptel.ac.in/courses/105102012/10>  
Concrete mix design <https://nptel.ac.in/courses/105102012/14>  
Concrete production & fresh concrete <https://nptel.ac.in/courses/105102012/19>  
Engineering properties of concrete<https://nptel.ac.in/courses/105102012/23>  
Dimensional stability & durability <https://nptel.ac.in/courses/105102012/27>  
Durability of concrete <https://nptel.ac.in/courses/105102012/31>  
Special concretes <https://nptel.ac.in/courses/105102012/36>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Seminars/Quizz(To assist in GATE Preparations
- Demonstrations in Lab
- Self Study on simple topics
- Simple problems solving using Excel
- Virtual Lab Experiments

<b>B. E. MECHANICAL ENGINEERING</b> <b>Choice Based Credit System (CBCS) and Outcome Based Education (OBE)</b> <b>SEMESTER – VII</b> <b>Professional Elective 3</b>			
<b>EMERGING SUSTAINABLE BUILDING COOLING TECHNOLOGIES</b>			
Course Code	<b>18ME742</b>	CIE Marks	40
Teaching Hours /Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
<b>Course Learning Objectives:</b>			
<ul style="list-style-type: none"> <li>• To provide an overview of emerging delivery systems for high performance green buildings and the basis on which their sustainability can be evaluated</li> <li>• To know the concepts of calculations of heating and cooling loads and the related economics.</li> <li>• To learn the importance of green fuels and its impact on environment.</li> <li>• To expose the students to sustainable cooling technologies.</li> </ul>			
<b>Module-1</b>			
<b>Social and Environmental Issues related to conventional Refrigeration and Air conditioning:</b> Climate Change and energy poverty implications of energy consumption and refrigerants use by conventional Vapor-Compression based RAC technologies, Global and Indian environmental, energy efficiency and green building policies, laws and rules warranting a trajectory shift in the RAC economy, Introduction to Thermal comfort as an 'ends' and cooling systems as a 'means', Socio-economic and environmental benefits of a Negawatt approach to energy conservation vs. a Megawatt approach towards power generation.			
<b>Module-2</b>			
<b>Thermal Comfort, Climate Analysis and Psychrometry:</b> The 'human thermal comfort' lens and its implications for cooling system design, Progressive models for addressing human thermal comfort needs, Thermodynamics of human body, Factors affecting human comfort, Introduction to the ASHRAE Std. 55, Adaptive Comfort Model and the Indian Model for Adaptive Comfort (IMAC) and its implications for mitigating climate change and energy consumption from cooling technologies, Tools for predicting thermal comfort in buildings, Principles and tools for climate analysis, Composition of Psychrometric Charts, Psychrometric processes of conventional and sustainable cooling technologies and representation on psychrometric chart, Application of psychrometry to design conventional and sustainable cooling technologies.			
<b>Indoor Air Quality and Building Cooling Load Modelling:</b> Addressing trade-offs between indoor air quality requirements, daylighting needs, and solar heat gain			
<b>Module-3</b>			
<b>Refrigeration Systems and Refrigerants:</b> Thermodynamics of Vapor Compression Refrigeration (VCR) and Vapor Absorption Machine (VAM) Cycles, Equipment used in commercial and residential VCR and VAM systems, Physical, Chemical, Thermodynamic and Environmental properties of Refrigerants and Refrigerant mixtures (zeotropic and azeotropic mixtures) used in conventional VCR system, Absorbent – Refrigerant combinations (Water-Ammonia and Lithium-Bromide) used in VAM systems, Physical, Chemical, Thermodynamic and Environmental properties of emerging Natural Refrigerants for VCR systems.			
<b>Module-4</b>			
<b>Air conditioning:</b> Air conditioning demand scenarios for India and associated health, social justice, energy access, and environmental Implications for its peoples and communities, Potential sustainable air conditioning scenarios for India, Heat transfer and psychrometric principles of air conditioning cycles, Engineering principles of air conditioning components, Air conditioning coefficient-of-performance calculation, Energy efficient air conditioning system, Energy and greenhouse gas emissions-based performance comparison of natural			

refrigerant and f-gas based air conditioners.

### Module-5

#### Sustainable Cooling Technologies:

Radical social justice fostering, energy conservation, and climate change mitigation potential of natural cooling, Design principles of natural and sustainable cooling systems, Science and engineering design principles of a) Direct, Indirect, and Hybrid (Direct-Indirect and DX) Evaporative Cooling technology, b) Structure Cooling, c) Radiant Cooling Systems, and d) Solar VAM technology, Basic equipment sizing calculations, System performance assessment methods, Comparative energy consumption, greenhouse gas emissions and life-cycle cost case studies for residential and commercial applications of conventional and sustainable cooling technologies.

**Course Outcomes:** At the end of the course, the student will be able to:

- CO1: Empathize with sustainable cooling as a means of enhancing social justice in India and mitigating climate change through their intellectual capabilities and ethical orientation
- CO2: Compute and Interpret cooling and heating loads in a building and how they could be efficiently managed by using building energy modelling software
- CO3: Estimate the performance of airconditioning systems using the principles of thermodynamics, heat transfer, and psychometry
- CO4: Calculate and interpret the energy, cost, and greenhouse gas emissions performance of conventional and sustainable cooling technologies.
- Co6: Conduct building and sustainable cooling modelling projects on a sophisticated building energy modelling software.

#### Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook/s</b>				
1	Refrigeration and Airconditioning	C P Arora	Tata McGraw Hill	3 <sup>rd</sup> Edition
2	Heating, Ventilating and Airconditioning	Faye C McQuiston, Jerald D. Parker, Jeffrey D. Spitler	Wiley Indian Private Ltd.	
<b>Reference Books</b>				
1	Radiant Heating and Cooling Handbook	Richard D. Watson	McGraw-Hill Publication	2002
Link: <a href="https://www.accessengineeringlibrary.com/browse/radiant-heating-and-cooling-handbook#p2000a97e9970iii001">https://www.accessengineeringlibrary.com/browse/radiant-heating-and-cooling-handbook#p2000a97e9970iii001</a>				
2	Evaporative Cooling		CAREL	
Link: <a href="http://www.carel.com/-evaporative-cooling-book">http://www.carel.com/-evaporative-cooling-book</a>				