



## CRITERION 1: CURRICULAR ASPECTS

### Key Indicator- 1.3 Curriculum Enrichment

**Metric 1.3.1:** Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum

**ACADEMIC YEAR 2022-23**  
**Department of Computer Science and Engineering**

Sl. No.	Professional Ethics		Total No. of Courses
	Course Code	Course Name	
1.	21CIP47	Constitution of India and Professional Ethics	07
2.	18CS51	Management, Entrepreneurship for IT Industry	
3.	21SCR36	Social Connect and Responsibility	
<b>Human Values</b>			
4.	21UHV49	Universal Human Values	
<b>Environment &amp; Sustainability</b>			
5.	18CIV59	Environmental Studies	
6.	18ME651	Non-Conventional Energy Sources	
7.	18ME751	Energy and Environment	

## Constitution of India and Professional Ethics (CIP)

<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>

**Course objectives:** This course will enable the students

1. To know about the basic structure of Indian Constitution.
2. To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.
3. To know about our Union Government, political structure & codes, procedures.
4. To know the State Executive & Elections system of India.
5. To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.

### Teaching-Learning Process

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.

- (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.

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.

### Module - 1

**Introduction to Indian Constitution:** 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 & Key concepts of the Preamble. Salient features of India Constitution.

### Module - 2

**FR's, FD's and DPSP's:** 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.

### Module - 3

**Union Executive :** 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.

### Module - 4

**State Executive & Elections, Amendments and Emergency Provisions:** State Executive, Election Commission, Elections & Electoral Process. Amendment to Constitution (How and Why) and Important Constitutional Amendments till today. Emergency Provisions.

### Module-5

**Professional Ethics:** Ethics & Values. Types of Ethics. Scope & Aims of Professional & Engineering Ethics. Positive and Negative Faces of Engineering Ethics. Clash of Ethics, Conflicts of Interest. The impediments to Responsibility. Trust & Reliability in Engineering, IPRs (Intellectual Property Rights), Risks, Safety and liability in Engineering.

### Course outcome (Course Skill Set) :

At the end of the course the student will be able to :

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.

**MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY**  
(Effective from the academic year 2018 -2019) SEMESTER -  
V

<b>Course Code</b>	<b>18CS51</b>	<b>CIE Marks</b>	40
<b>Number of Contact Hours/Week</b>	2:2:0	<b>SEE Marks</b>	60
<b>Total Number of Contact Hours</b>	40	<b>Exam Hours</b>	03
<b>CREDITS – 03</b>			
<b>Course Learning Objectives:</b> This course (18CS51) will enable students to:			
<ul style="list-style-type: none"> <li>• Explain the principles of management, organization and entrepreneur.</li> <li>• Discuss on planning, staffing, ERP and their importance</li> <li>• Infer the importance of intellectual property rights and relate the institutional support</li> </ul>			
<b>Module – 1</b>			<b>Contact Hours</b>
<b>Introduction</b> - Meaning, nature and characteristics of management, scope and Functional areas of management, goals of management, levels of management, brief overview of evolution of management theories,. Planning- Nature, importance, types of plans, steps in planning, Organizing- nature and purpose, types of Organization, Staffing- meaning, process of recruitment and selection <b>RBT: L1, L2</b>			08
<b>Module – 2</b>			
<b>Directing and controlling-</b> meaning and nature of directing, leadership styles, motivation Theories, Communication- Meaning and importance, Coordination- meaning and importance, Controlling- meaning, steps in controlling, methods of establishing control. <b>RBT: L1, L2</b>			08
<b>Module – 3</b>			
<b>Entrepreneur</b> – meaning of entrepreneur, characteristics of entrepreneurs, classification and types of entrepreneurs, various stages in entrepreneurial process, role of entrepreneurs in economic development, entrepreneurship in India and barriers to entrepreneurship. Identification of business opportunities, market feasibility study, technical feasibility study, financial feasibility study and social feasibility study. <b>RBT: L1, L2</b>			08
<b>Module – 4</b>			
<b>Preparation of project and ERP</b> - meaning of project, project identification, project selection, project report, need and significance of project report, contents, formulation, guidelines by planning commission for project report, <b>Enterprise Resource Planning: Meaning and Importance-</b> ERP and Functional areas of Management – Marketing / Sales- Supply Chain Management – Finance and Accounting – Human Resources – Types of reports and methods of report generation <b>RBT: L1, L2</b>			08
<b>Module – 5</b>			
<b>Micro and Small Enterprises:</b> Definition of micro and small enterprises, characteristics and advantages of micro and small enterprises, steps in establishing micro and small enterprises, Government of India industrial policy 2007 on micro and small enterprises, case study (Microsoft), Case study(Captain G R Gopinath),case study (N R Narayana Murthy & Infosys), <b>Institutional support:</b> MSME-DI, NSIC, SIDBI, KIADB, KSSIDC, TECSOK, KSFC, DIC and District level single window agency, <b>Introduction to IPR.</b>			08

<b>RBT: L1, L2</b>	
<b>Course outcomes:</b> The students should be able to:	
<ul style="list-style-type: none"> <li>• Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship</li> <li>• Utilize the resources available effectively through ERP</li> <li>• Make use of IPRs and institutional support in entrepreneurship</li> </ul>	
<b>Question Paper Pattern:</b>	
<ul style="list-style-type: none"> <li>• The question paper will have ten questions.</li> <li>• Each full Question consisting of 20 marks</li> <li>• There will be 2 full questions (with a maximum of four sub questions) from each module.</li> <li>• Each full question will have sub questions covering all the topics under a module.</li> <li>• The students will have to answer 5 full questions, selecting one full question from each module.</li> </ul>	
<b>Textbooks:</b>	
<ol style="list-style-type: none"> <li>1. Principles of Management -P. C. Tripathi, P. N. Reddy; Tata McGraw Hill, 4th / 6<sup>th</sup> Edition, 2010.</li> <li>2. Dynamics of Entrepreneurial Development &amp; Management -Vasant Desai Himalaya Publishing House.</li> <li>3. Entrepreneurship Development -Small Business Enterprises -Poornima M Charantimath Pearson Education – 2006.</li> <li>4. Management and Entrepreneurship - Kanishka Bedi- Oxford University Press-2017</li> </ol>	
<b>Reference Books:</b>	
<ol style="list-style-type: none"> <li>1. Management Fundamentals -Concepts, Application, Skill Development Robert Lusier – Thomson.</li> <li>2. Entrepreneurship Development -S S Khanka -S Chand &amp; Co.</li> <li>3. Management -Stephen Robbins -Pearson Education /PHI -17th Edition, 2003</li> </ol>	

<b>SOCIAL CONNECT &amp; RESPONSIBILITIES</b>			
<b>Course Code</b>	<b>21SCR36</b>	<b>CIE Marks</b>	<b>50</b>
Teaching Hours week (L:T:P:S)	1: 0: 0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	03
Department	Management Studies / Engineering Department		
Offered for	3 <sup>rd</sup> Semester		
Prerequisite	Nil		
<b>Objectives:</b> The Course will			
<ul style="list-style-type: none"> <li>• Enable the student to do a deep dive into societal challenges being addressed by NGO(s), social enterprises &amp; The government and build solutions to alleviate these complex social problems through immersion, design &amp; technology.</li> <li>• Provide a formal platform for students to communicate and connect with their surroundings.</li> <li>• Enable to create of a responsible connection with society.</li> </ul>			
<b>Learning Outcomes:</b> The students are expected to have the ability to :			
<ol style="list-style-type: none"> <li>1. Understand social responsibility</li> <li>2. Practice sustainability and creativity</li> <li>3. Showcase planning and organizational skills</li> </ol>			
<b>Contents:</b>			
The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large. The course will engage students in interactive sessions, open mic, reading groups, storytelling sessions, and semester-long activities conducted by faculty mentors. In the following a set of activities planned for the course have been listed :			
<b>Module-I</b>			
<b>Plantation and adoption of a tree:</b> Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.			
<b>Module-II</b>			
<b>Heritage walk and crafts corner:</b> Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.			
<b>Module-III</b>			
<b>Organic farming and waste management:</b> usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus.			
<b>Module-IV</b>			
<b>Water Conservation:</b> knowing the present practices in the surrounding villages and			

implementation in the campus, documentary or photo blog presenting the current practices.

### Module-V

**Food Walk** City's culinary practices, food lore, and indigenous materials of the region used in cooking.

#### Activities

**Jamming session, open mic, and poetry:** Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.

#### PEDAGOGY

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersion with NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

#### COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversational will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

A total of 14-20 hrs engagement per semester is required for the 3<sup>rd</sup> semester of the B.E. /B.Tech. program. The students will be divided into 10 groups of 35 each. Each group will be handled by two **faculty mentors**. Faculty mentors will design the activities (particularly Jamming sessions open mic, and poetry)

**Faculty mentors** has to design the evaluation system.

#### Guideline for Assessment Process:

##### Continuous Internal Evaluation (CIE)

After completion of, the social connect, the student shall prepare, with daily **diary** as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period. The report should be signed by the mentor. The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed.

Marks allotted for the diary are out of 50.

Planning and scheduling the social connect

Information/Data collected during the social connect

Analysis of the information/data and report writing

Considering all above points allotting the marks as mentioned below-

Excellent	80 to 100
Good	60 to 79
Satisfactory	40 to 59
Unsatisfactory and fail	<39

**Semester End Examination (SEE)**

This Jamming session will be conducted at the end of the course for **50 marks**

Jamming session includes -Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art painting, and fine art.

Faculty mentor has to design the evaluation system for the Jamming session.



Pedagogy (Guidelines) may differ depending on local resources available for the study

Module	Topic	Content	Group Size	Location	Magnitude	Activity	Reporting	Evaluation
I	Plantation and adoption of a tree	Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	03 – 05	Farmers Land or Road side or Community area or institution's campus, any one location to be selected.	One  Students must monitor it for three years	Site selection  Select suitable species in consultation with horticulture, forest or agriculture department. Interact with NGO/Industry and community to plant Tag the plant for continuous monitoring	Report shall be handwritten or blog with paintings, sketches, poster, video and/or photograph with Geotag.	Each module is evaluated for 50 Marks and average of all the five modules will be the final marks.  <b>CIE Rubrics for 50 M</b>  Planning and scheduling the social connect – 15 M  Information/Data collected during the social connect – 15 M  Analysis of the information/data and report writing – 20 M
II	Heritage walk and crafts corner	Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.	03 - 05	Preferably Within the city where institution is located or home town of the student group	One or two  One can be a structure or a heritage building the other can be heritage custom or practise	Survey in the form of questioner by connecting to the people and asking. No standard questioner to be given by faculty and has to be evolved involving students. Questions during survey can be asked in local language but report language is English.		
III	Waste management	Wet waste management in neighbouring villages, and implementation in the campus.	03 - 05  More than one group can be	Preferably in the nearby villages and within the campus.	One	Report on importance and benefits of Waste management. Report on segregation, collection, transportation and disposal.		<b>SEE 50 M:</b> Presentation, Jamming session, Open mic, Group

			assigned one task based on magnitude of task.			Suggestion for composting.  Visit nearby village/location to sensitize farmers and public about waste management and also document current practises.		discussion and debate.
III	Organic farming	Usefulness of organic farming in neighbouring villages, and implementation in the campus.	03 – 05	Visit to farming lands where organic farming is going on  Campus Garden  Roof top Garden or Vertical Garden or hydroponics if land is scarce.	One	Collect data on organic farming in the vicinity. Like types of crop, methodology etc.,.  Suggestion for implementation at selected locations		
IV	Water Conservation	Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.	03 – 05	Rain water harvesting demonstration available in the campus or surroundings	One	Visit lakes/pond/river/dry well to involve on rejuvenation activity.  Or  Assessment of Water budget in the campus/village		

						Report on traditional water conservation practices (to minimize wastage)		
V	Food Walk	City's culinary practices, food lore, and indigenous materials of the region used in cooking.	03 - 05	Within the city where institution is located  Food culture of student's resident region	One	Survey local food centres and identify the speciality  Identify and study the food ingredients  Report on the regional foods  Report on Medicinal values of the local food grains, and plants.		

\*\*Important recommendations requested; Special Appreciation from institution and university for students who take care of plants for three years.

## IV Semester

### UNIVERSAL HUMAN VALUES-II: UNDERSTANDING HARMONY and ETHICAL HUMAN CONDUCT

#### Title of the subject

Course Code	21UHV49	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:0:0	SEE Marks	50
Total Hours of Pedagogy	20	Total Marks	100
Credits	01	Exam Hours	01

#### Course objectives:

This introductory course input is intended:

1. 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.
2. 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.
3. 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 orientational input in value education to the young enquiring minds.

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

These are sample Strategies, which teacher 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. The course is in the form of 20 lectures (discussions)
3. It is free from any dogma or value prescriptions.
4. It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation – the whole existence is the lab and every activity is a source of reflection.
5. 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 self-evolution.
6. This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.

#### Module-1

##### Introduction to Value Education (4 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

#### Teaching-Learning Process

Introduction to Value Education- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos

<b>Module-2</b>	
<p><b>Harmony in the Human Being (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<b>Module-3</b>	
<p><b>Harmony in the Family and Society (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<b>Module-4</b>	
<p><b>Harmony in the Nature/Existence (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<b>Module-5</b>	
<p><b>Implications of the Holistic Understanding – a Look at Professional Ethics (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<p><b>Course outcome (Course Skill Set)</b></p> <p>By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.</p> <p>They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). 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.</p>	

Therefore, the course and further follow up is expected to positively impact common graduate attributes like:

1. Holistic vision of life
2. Socially responsible behaviour
3. Environmentally responsible work
4. Ethical human conduct
5. Having Competence and Capabilities for Maintaining Health and Hygiene
6. Appreciation and aspiration for excellence (merit) and gratitude for all

### **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**

(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 01 hours**)

1. The question paper will have 50 questions. Each question is set for 01 marks.
2. The students have to answer all the questions, selecting one full question from each module

### **Suggested Learning Resources:**

#### **Books**

#### **-READINGS:**

#### **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, 2<sup>nd</sup> Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

- b. The Teacher's Manual

Teachers" Manual for *A Foundation Course in Human Values and Professional Ethics*, R R Gaur, R Asthana, G

### **Reference Books**

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 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):**

1. Value Education websites, <https://www.uhv.org.in/uhv-ii>, <http://uhv.ac.in>, <http://www.uptu.ac.in>
2. **Story of Stuff**, <http://www.storyofstuff.com>
3. **Al Gore, An Inconvenient Truth, Paramount Classics, USA**
4. **Charlie Chaplin, Modern Times, United Artists, USA**
5. **IIT Delhi, Modern Technology – the Untold Story**
6. Gandhi A., Right Here Right Now, Cyclewala Productions
7. [https://www.youtube.com/channel/UCQxWr5QB\\_eZUnwxSwxXEkQw](https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw)
8. [https://fdp-si.aicte-india.org/8dayUHV\\_download.php](https://fdp-si.aicte-india.org/8dayUHV_download.php)
9. <https://www.youtube.com/watch?v=8ovkLRYXijE>
10. <https://www.youtube.com/watch?v=OgdNx0X923I>
11. <https://www.youtube.com/watch?v=nGRcbRpvGoU>
12. <https://www.youtube.com/watch?v=sDxGX0gYEKM>

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

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**B.E IN CIVIL ENGINEERING(CV-2018-19)**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**SEMESTER – V**

**ENVIRONMENTAL STUDIES**

Course Code	<b>18CIV59</b>	CIE Marks	40	
Teaching Hours / Week (L:T:P)	(1:0:0)	SEE Marks	60	
Credits	01	Exam Hours	02	
<b>Module - 1</b>				
<p><b>Ecosystems</b> (Structure and Function): Forest, Desert, Wetlands, Riverine, Oceanic and Lake.  <b>Biodiversity:</b> Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.</p>				
<b>Module - 2</b>				
<p><b>Advances in Energy Systems</b> (Merits, Demerits, Global Status and Applications): Hydrogen, Solar, OTEC, Tidal and Wind.  <b>Natural Resource Management</b> (Concept and case-studies): Disaster Management, Sustainable Mining, Cloud Seeding, and Carbon Trading.</p>				
<b>Module - 3</b>				
<p><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.</p>				
<b>Module - 4</b>				
<p><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.</p>				
<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.  <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.</p>				
<p><b>Course outcomes:</b> At the end of the course, students 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>Question paper pattern:</b></p> <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& PiyushMalaviya	Acme Learning Pvt. Ltd. New Delhi.	1 <sup>st</sup> Edition

**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER –VI**  
**OPEN ELECTIVE A**

**NON CONVENTIONAL ENERGY SOURCES**

Course Code	<b>18ME651</b>	CIE Marks	40
Teaching Hours/Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

**Course Learning Objectives:**

- To introduce the concepts of solar energy, its radiation, collection, storage and application.
- To introduce the concepts and applications of Wind energy, Biomass energy, Geothermal energy and Ocean energy as alternative energy sources.
- To explore society's present needs and future energy demands.
- To examine energy sources and systems, including fossil fuels and nuclear energy, and then focus on alternate, renewable energy sources such as solar, biomass (conversions), wind power, geothermal, etc.
- To get exposed to energy conservation methods.

**Module-1**

**Introduction:** Energy source, India's production and reserves of commercial energy sources, need for non-conventional energy sources, energy alternatives, solar, thermal, photovoltaic. Water power, wind biomass, ocean temperature difference, tidal and waves, geothermal, tar sands and oil shale, nuclear (Brief descriptions); advantages and disadvantages, comparison (Qualitative and Quantitative).

**Solar Radiation:** Extra-Terrestrial radiation, spectral distribution of extra terrestrial radiation, solar constant, solar radiation at the earth's surface, beam, diffuse and global radiation, solar radiation data.

**Measurement of Solar Radiation:** Pyrometer, shading ring pyr heliometer, sunshine recorder, schematic diagrams and principle of working.

**Module-2**

**Solar Radiation Geometry:** Flux on a plane surface, latitude, declination angle, surface azimuth angle, hour angle, zenith angle, solar altitude angle expression for the angle between the incident beam and the normal to a plane surface (No derivation) local apparent time. Apparent motion of sun, day length, numerical examples.

**Radiation Flux on a Tilted Surface:** Beam, diffuse and reflected radiation, expression for flux on a tilted surface (no derivations) numerical examples.

**Solar Thermal Conversion:** Collection and storage, thermal collection devices, liquid flat plate collectors, solar air heaters concentrating collectors (cylindrical, parabolic, paraboloid) (Quantitative analysis); sensible heat storage, latent heat storage, application of solar energy water heating. Space heating and cooling, active and passive systems, power generation, refrigeration. Distillation (Qualitative analysis) solar pond, principle of

**Module-3**

**Performance Analysis of Liquid Flat Plate Collectors:** General description, collector geometry, selective surface (qualitative discussion) basic energy-balance equation, stagnation temperature, transmissivity of the cover system, transmissivity – absorptivity product, numerical examples. The overall loss coefficient, correlation for the top loss coefficient, bottom and side loss coefficient, problems (all correlations to be provided). Temperature distribution between the collector tubes, collector heat removal factor, collector efficiency factor and collector flow factor, mean plate temperature, instantaneous efficiency (all expressions to be provided). Effect of various parameters on the collector performance; collector orientation, selective surface, fluid inlet temperature, number covers, dust.

**Photovoltaic Conversion:** Description, principle of working and characteristics, application.

**Module-4**

**Wind Energy :** Properties of wind, availability of wind energy in India, wind velocity and power from wind; major problems associated with wind power, wind machines; Types of wind machines and their characteristics, horizontal and vertical axis wind mills, elementary design principles; coefficient of performance of a wind mill rotor, aerodynamic considerations of wind mill design, numerical examples.

**Tidal Power:** Tides and waves as energy suppliers and their mechanics; fundamental characteristics of tidal power, harnessing tidal energy, limitations.

**Ocean Thermal Energy Conversion:** Principle of working, Rankine cycle, OTEC power stations in the world, problems associated with OTEC.

#### Module-5

**Geothermal Energy Conversion:** Principle of working, types of geothermal station with schematic diagram, geothermal plants in the world, problems associated with geothermal conversion, scope of geothermal energy.

**Energy from Bio Mass:** Photosynthesis, photosynthetic oxygen production, energy plantation, bio gas production from organic wastes by anaerobic fermentation, description of bio-gas plants, transportation of bio-gas, problems involved with bio-gas production, application of bio-gas, application of bio-gas in engines, advantages.

**Hydrogen Energy:** Properties of Hydrogen with respect to its utilization as a renewable form of energy, sources of hydrogen, production of hydrogen, electrolysis of water, thermal decomposition of water, thermo chemical production bio-chemical production.

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

CO1: Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.

CO2: Know the need of renewable energy resources, historical and latest developments.

CO3: Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.

CO4: Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.

CO5: Understand the concept of Biomass energy resources and their classification, types of biogas Plants-applications

CO6: Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.

CO7: Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications.

#### 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	Non-Convention Energy Resources	B H Khan	McGraw Hill Education (India) Pvt. Ltd.	3 <sup>rd</sup> Edition
2	Solar energy	Subhas P Sukhatme	Tata McGraw Hill	2 <sup>nd</sup> Edition, 1996.
3	Non-Conventional Energy Sources	G.D Rai	Khanna Publishers	2003
<b>Reference Books</b>				
1	Renewable Energy Sources and Conversion Technology	N.K.Bansal, Manfred Kleeman&MechaelMeliss	Tata McGraw Hill.	2004
2	Renewable Energy Technologies	Ramesh R & Kumar K U	Narosa Publishing House New Delhi	
3	Conventional Energy Systems	K M, Non	Wheeler Publishing Co. Ltd., New Delhi	2003

**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER – VI**  
**Professional Elective 1**

**ENERGY AND ENVIRONMENT**

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

**Course Learning Objectives:**

- To understand the fundamentals of energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies.
- To introduce various aspects of environmental pollution and its control.
- To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc.
- To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.

**Module-1**

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.

**Module-2**

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.

**Module-3**

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.

**Module-4**

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.

**Module-5**

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.

**Group assignments:**

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.

**Course Outcomes:** 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



## CRITERION 1 – CURRICULAR ASPECTS

### Key Indicator- 1.3 Curriculum Enrichment

#### Metric Number: 1.3.1

**Institution integrates crosscutting issues relevant to professional Ethics, Gender Human Values, Environment and Sustainability in transacting the curriculum**

**Department of Information Science and Engineering**

**Academic Year 2022- 2023**

Sl. No.	Professional Ethics		Total No. of Courses
	Course Code	Course Name	
1.	21CIP47	Constitution of India and Professional Ethics	07
2.	18CS51	Management, Entrepreneurship for IT Industry	
	<b>Human Values</b>		
3.	21SCR36	Social Connect and Responsibility	
4.	21UHV49	Universal Human Values	
	<b>Environment &amp; Sustainability</b>		
5.	18CIV59	Environmental Studies	
6.	18ME651	Non-Conventional Energy Sources	
7.	18ME751	Energy and Environment	

<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.



**MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY**

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2016 -2017)

**SEMESTER – V**

Subject Code	15CS51	IA Marks	20
Number of Lecture Hours/Week	4	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

**CREDITS – 04****Course objectives:** This course will enable students to

- Explain the principles of management, organization and entrepreneur.
- Discuss on planning, staffing, ERP and their importance
- Infer the importance of intellectual property rights and relate the institutional support

**Module – 1****Teaching Hours****Introduction** - Meaning, nature and characteristics of management, scope and Functional areas of management, goals of management, levels of management, brief overview of evolution of management theories,. Planning- Nature, importance, types of plans, steps in planning, Organizing- nature and purpose, types of Organization, Staffing- meaning, process of recruitment and selection**10 Hours****Module – 2****Directing and controlling-** meaning and nature of directing, leadership styles, motivation Theories, Communication- Meaning and importance, Coordination- meaning and importance, Controlling- meaning, steps in controlling, methods of establishing control.**10 Hours****Module – 3****Entrepreneur** – meaning of entrepreneur, characteristics of entrepreneurs, classification and types of entrepreneurs, various stages in entrepreneurial process, role of entrepreneurs in economic development, entrepreneurship in India and barriers to entrepreneurship. Identification of business opportunities, market feasibility study, technical feasibility study, financial feasibility study and social feasibility study.**10 Hours****Module – 4****Preparation of project and ERP** - meaning of project, project identification, project selection, project report, need and significance of project report, contents, formulation, guidelines by planning commission for project report, **Enterprise Resource Planning: Meaning and Importance-** ERP and Functional areas of Management – Marketing / Sales- Supply Chain Management – Finance and Accounting – Human Resources – Types of reports and methods of report generation**10 Hours****Module – 5****Micro and Small Enterprises:** Definition of micro and small enterprises, characteristics and advantages of micro and small enterprises, steps in establishing micro and small enterprises, Government of India industrial policy 2007 on micro and small enterprises, case study (Microsoft), Case study(Captain G R Gopinath),case study (N R Narayana Murthy & Infosys), **Institutional support:** MSME-DI, NSIC, SIDBI, KIADB, KSSIDC, TECSOK, KSFC, DIC and District level single window agency, **Introduction to IPR.****10 Hours****Course outcomes:** The students should be able to:

- Define management, organization, entrepreneur, planning, staffing, ERP and outline

their importance in entrepreneurship

- Utilize the resources available effectively through ERP
- Make use of IPRs and institutional support in entrepreneurship

**Question paper pattern:**

The question paper will have TEN questions.

There will be TWO questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer FIVE full questions, selecting ONE full question from each module.

**Text Books:**

1. Principles of Management -P. C. Tripathi, P. N. Reddy; Tata McGraw Hill, 4th / 6<sup>th</sup> Edition, 2010.
2. Dynamics of Entrepreneurial Development & Management -Vasant Desai Himalaya Publishing House.
3. Entrepreneurship Development -Small Business Enterprises -Poornima M Charantimath Pearson Education – 2006.
4. Management and Entrepreneurship - Kanishka Bedi- Oxford University Press-2017

**Reference Books:**

1. Management Fundamentals -Concepts, Application, Skill Development Robert Lusier – Thomson.
2. Entrepreneurship Development -S S Khanka -S Chand & Co.
3. Management -Stephen Robbins -Pearson Education /PHI -17th Edition, 2003

<b>SOCIAL CONNECT &amp; RESPONSIBILITIES</b>			
<b>Course Code</b>	<b>21SCR36</b>	<b>CIE Marks</b>	<b>50</b>
Teaching Hours week (L:T:P:S)	1: 0: 0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	03
Department	Management Studies / Engineering Department		
Offered for	3 <sup>rd</sup> Semester		
Prerequisite	Nil		
<b>Objectives:</b> The Course will			
<ul style="list-style-type: none"> <li>• Enable the student to do a deep drive into societal challenges being addressed by NGO(s), social enterprises &amp; The government and build solutions to alleviate these complex social problems through immersion, design &amp; technology.</li> <li>• Provide a formal platform for students to communicate and connect with their surroundings.</li> <li>• Enable to create of a responsible connection with society.</li> </ul>			
<b>Learning Outcomes:</b> The students are expected to have the ability to :			
<ol style="list-style-type: none"> <li>1. Understand social responsibility</li> <li>2. Practice sustainability and creativity</li> <li>3. Showcase planning and organizational skills</li> </ol>			
<b>Contents:</b>			
The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large. The course will engage students in interactive sessions, open mic, reading groups, storytelling sessions, and semester-long activities conducted by faculty mentors. In the following a set of activities planned for the course have been listed :			
<b>Module-I</b>			
<b>Plantation and adoption of a tree:</b> Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.			
<b>Module-II</b>			
<b>Heritage walk and crafts corner:</b> Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.			
<b>Module-III</b>			
<b>Organic farming and waste management:</b> usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus.			
<b>Module-IV</b>			
<b>Water Conservation:</b> knowing the present practices in the surrounding villages and			

implementation in the campus, documentary or photo blog presenting the current practices.

### Module-V

**Food Walk** City's culinary practices, food lore, and indigenous materials of the region used in cooking.

#### Activities

**Jamming session, open mic, and poetry:** Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.

#### PEDAGOGY

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersion with NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

#### COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversational will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

A total of 14-20 hrs engagement per semester is required for the 3<sup>rd</sup> semester of the B.E. /B.Tech. program. The students will be divided into 10 groups of 35 each. Each group will be handled by two **faculty mentors**. Faculty mentors will design the activities (particularly Jamming sessions open mic, and poetry)

**Faculty mentors** has to design the evaluation system.

#### Guideline for Assessment Process:

##### Continuous Internal Evaluation (CIE)

After completion of, the social connect, the student shall prepare, with daily **diary** as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period. The report should be signed by the mentor. The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed.

Marks allotted for the diary are out of 50.

Planning and scheduling the social connect

Information/Data collected during the social connect

Analysis of the information/data and report writing

Considering all above points allotting the marks as mentioned below-

Excellent	80 to 100
Good	60 to 79
Satisfactory	40 to 59
Unsatisfactory and fail	<39

**Semester End Examination (SEE)**

This Jamming session will be conducted at the end of the course for **50 marks**

Jamming session includes -Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art painting, and fine art.

Faculty mentor has to design the evaluation system for the Jamming session.

Pedagogy (Guidelines) may differ depending on local resources available for the study

Module	Topic	Content	Group Size	Location	Magnitude	Activity	Reporting	Evaluation
I	Plantation and adoption of a tree	Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	03 – 05	Farmers Land or Road side or Community area or institution's campus, any one location to be selected.	One  Students must monitor it for three years	Site selection  Select suitable species in consultation with horticulture, forest or agriculture department. Interact with NGO/Industry and community to plant Tag the plant for continuous monitoring	Report shall be handwritten or blog with paintings, sketches, poster, video and/or photograph with Geotag.	Each module is evaluated for 50 Marks and average of all the five modules will be the final marks.  <b>CIE Rubrics for 50 M</b>  Planning and scheduling the social connect – 15 M  Information/Data collected during the social connect – 15 M  Analysis of the information/data and report writing – 20 M
II	Heritage walk and crafts corner	Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.	03 - 05	Preferably Within the city where institution is located or home town of the student group	One or two  One can be a structure or a heritage building the other can be heritage custom or practise	Survey in the form of questioner by connecting to the people and asking. No standard questioner to be given by faculty and has to be evolved involving students. Questions during survey can be asked in local language but report language is English.		
III	Waste management	Wet waste management in neighbouring villages, and implementation in the campus.	03 - 05  More than one group can be	Preferably in the nearby villages and within the campus.	One	Report on importance and benefits of Waste management. Report on segregation, collection, transportation and disposal.		<b>SEE 50 M:</b> Presentation, Jamming session, Open mic, Group

			assigned one task based on magnitude of task.			Suggestion for composting.  Visit nearby village/location to sensitize farmers and public about waste management and also document current practises.		discussion and debate.
III	Organic farming	Usefulness of organic farming in neighbouring villages, and implementation in the campus.	03 – 05	Visit to farming lands where organic farming is going on  Campus Garden  Roof top Garden or Vertical Garden or hydroponics if land is scarce.	One	Collect data on organic farming in the vicinity. Like types of crop, methodology etc.,.  Suggestion for implementation at selected locations		
IV	Water Conservation	Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.	03 – 05	Rain water harvesting demonstration available in the campus or surroundings	One	Visit lakes/pond/river/dry well to involve on rejuvenation activity.  Or  Assessment of Water budget in the campus/village		

						Report on traditional water conservation practices (to minimize wastage)		
V	Food Walk	City's culinary practices, food lore, and indigenous materials of the region used in cooking.	03 - 05	Within the city where institution is located  Food culture of student's resident region	One	Survey local food centres and identify the speciality  Identify and study the food ingredients  Report on the regional foods  Report on Medicinal values of the local food grains, and plants.		

\*\*Important recommendations requested; Special Appreciation from institution and university for students who take care of plants for three years.



## IV Semester

### UNIVERSAL HUMAN VALUES-II: UNDERSTANDING HARMONY and ETHICAL HUMAN CONDUCT

#### Title of the subject

Course Code	21UHV49	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:0:0	SEE Marks	50
Total Hours of Pedagogy	20	Total Marks	100
Credits	01	Exam Hours	01

#### Course objectives:

This introductory course input is intended:

1. 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.
2. 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.
3. 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 orientational input in value education to the young enquiring minds.

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

These are sample Strategies, which teacher 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. The course is in the form of 20 lectures (discussions)
3. It is free from any dogma or value prescriptions.
4. It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation – the whole existence is the lab and every activity is a source of reflection.
5. 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 self-evolution.
6. This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.

#### Module-1

##### Introduction to Value Education (4 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

#### Teaching-Learning Process

Introduction to Value Education- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos

<b>Module-2</b>	
<p><b>Harmony in the Human Being (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<b>Module-3</b>	
<p><b>Harmony in the Family and Society (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<b>Module-4</b>	
<p><b>Harmony in the Nature/Existence (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<b>Module-5</b>	
<p><b>Implications of the Holistic Understanding – a Look at Professional Ethics (4 hours)</b></p> <p>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>	
<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
<p><b>Course outcome (Course Skill Set)</b></p> <p>By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.</p> <p>They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). 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.</p>	

Therefore, the course and further follow up is expected to positively impact common graduate attributes like:

1. Holistic vision of life
2. Socially responsible behaviour
3. Environmentally responsible work
4. Ethical human conduct
5. Having Competence and Capabilities for Maintaining Health and Hygiene
6. Appreciation and aspiration for excellence (merit) and gratitude for all

### **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**

(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 01 hours**)

1. The question paper will have 50 questions. Each question is set for 01 marks.
2. The students have to answer all the questions, selecting one full question from each module

### **Suggested Learning Resources:**

#### **Books**

#### **-READINGS:**

#### **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, 2<sup>nd</sup> Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

- b. The Teacher's Manual

Teachers" Manual for *A Foundation Course in Human Values and Professional Ethics*, R R Gaur, R Asthana, G

### **Reference Books**

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 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):**

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

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

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**B.E IN CIVIL ENGINEERING(CV-2018-19)**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**SEMESTER – V**

**ENVIRONMENTAL STUDIES**

Course Code	<b>18CIV59</b>	CIE Marks	40	
Teaching Hours / Week (L:T:P)	(1:0:0)	SEE Marks	60	
Credits	01	Exam Hours	02	
<b>Module - 1</b>				
<p><b>Ecosystems</b> (Structure and Function): Forest, Desert, Wetlands, Riverine, Oceanic and Lake.  <b>Biodiversity:</b> Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.</p>				
<b>Module - 2</b>				
<p><b>Advances in Energy Systems</b> (Merits, Demerits, Global Status and Applications): Hydrogen, Solar, OTEC, Tidal and Wind.  <b>Natural Resource Management</b> (Concept and case-studies): Disaster Management, Sustainable Mining, Cloud Seeding, and Carbon Trading.</p>				
<b>Module - 3</b>				
<p><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.</p>				
<b>Module - 4</b>				
<p><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.</p>				
<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.  <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.</p>				
<p><b>Course outcomes:</b> At the end of the course, students 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>Question paper pattern:</b></p> <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 & PiyushMalaviya	Acme Learning Pvt. Ltd. New Delhi.	1 <sup>st</sup> Edition

**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER –VI**  
**OPEN ELECTIVE A**

**NON CONVENTIONAL ENERGY SOURCES**

Course Code	<b>18ME651</b>	CIE Marks	40
Teaching Hours/Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

**Course Learning Objectives:**

- To introduce the concepts of solar energy, its radiation, collection, storage and application.
- To introduce the concepts and applications of Wind energy, Biomass energy, Geothermal energy and Ocean energy as alternative energy sources.
- To explore society's present needs and future energy demands.
- To examine energy sources and systems, including fossil fuels and nuclear energy, and then focus on alternate, renewable energy sources such as solar, biomass (conversions), wind power, geothermal, etc.
- To get exposed to energy conservation methods.

**Module-1**

**Introduction:** Energy source, India's production and reserves of commercial energy sources, need for non-conventional energy sources, energy alternatives, solar, thermal, photovoltaic. Water power, wind biomass, ocean temperature difference, tidal and waves, geothermal, tar sands and oil shale, nuclear (Brief descriptions); advantages and disadvantages, comparison (Qualitative and Quantitative).

**Solar Radiation:** Extra-Terrestrial radiation, spectral distribution of extra terrestrial radiation, solar constant, solar radiation at the earth's surface, beam, diffuse and global radiation, solar radiation data.

**Measurement of Solar Radiation:** Pyrometer, shading ring pyr heliometer, sunshine recorder, schematic diagrams and principle of working.

**Module-2**

**Solar Radiation Geometry:** Flux on a plane surface, latitude, declination angle, surface azimuth angle, hour angle, zenith angle, solar altitude angle expression for the angle between the incident beam and the normal to a plane surface (No derivation) local apparent time. Apparent motion of sun, day length, numerical examples.

**Radiation Flux on a Tilted Surface:** Beam, diffuse and reflected radiation, expression for flux on a tilted surface (no derivations) numerical examples.

**Solar Thermal Conversion:** Collection and storage, thermal collection devices, liquid flat plate collectors, solar air heaters concentrating collectors (cylindrical, parabolic, paraboloid) (Quantitative analysis); sensible heat storage, latent heat storage, application of solar energy water heating. Space heating and cooling, active and passive systems, power generation, refrigeration. Distillation (Qualitative analysis) solar pond, principle of

**Module-3**

**Performance Analysis of Liquid Flat Plate Collectors:** General description, collector geometry, selective surface (qualitative discussion) basic energy-balance equation, stagnation temperature, transmissivity of the cover system, transmissivity – absorptivity product, numerical examples. The overall loss coefficient, correlation for the top loss coefficient, bottom and side loss coefficient, problems (all correlations to be provided). Temperature distribution between the collector tubes, collector heat removal factor, collector efficiency factor and collector flow factor, mean plate temperature, instantaneous efficiency (all expressions to be provided). Effect of various parameters on the collector performance; collector orientation, selective surface, fluid inlet temperature, number covers, dust.

**Photovoltaic Conversion:** Description, principle of working and characteristics, application.

**Module-4**

**Wind Energy :** Properties of wind, availability of wind energy in India, wind velocity and power from wind; major problems associated with wind power, wind machines; Types of wind machines and their characteristics, horizontal and vertical axis wind mills, elementary design principles; coefficient of performance of a wind mill rotor, aerodynamic considerations of wind mill design, numerical examples.

**Tidal Power:** Tides and waves as energy suppliers and their mechanics; fundamental characteristics of tidal power, harnessing tidal energy, limitations.

**Ocean Thermal Energy Conversion:** Principle of working, Rankine cycle, OTEC power stations in the world, problems associated with OTEC.

#### Module-5

**Geothermal Energy Conversion:** Principle of working, types of geothermal station with schematic diagram, geothermal plants in the world, problems associated with geothermal conversion, scope of geothermal energy.

**Energy from Bio Mass:** Photosynthesis, photosynthetic oxygen production, energy plantation, bio gas production from organic wastes by anaerobic fermentation, description of bio-gas plants, transportation of bio-gas, problems involved with bio-gas production, application of bio-gas, application of bio-gas in engines, advantages.

**Hydrogen Energy:** Properties of Hydrogen with respect to its utilization as a renewable form of energy, sources of hydrogen, production of hydrogen, electrolysis of water, thermal decomposition of water, thermo chemical production bio-chemical production.

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

CO1: Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.

CO2: Know the need of renewable energy resources, historical and latest developments.

CO3: Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.

CO4: Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.

CO5: Understand the concept of Biomass energy resources and their classification, types of biogas Plants-applications

CO6: Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.

CO7: Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications.

#### 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	Non-Convention Energy Resources	B H Khan	McGraw Hill Education (India) Pvt. Ltd.	3 <sup>rd</sup> Edition
2	Solar energy	Subhas P Sukhatme	Tata McGraw Hill	2 <sup>nd</sup> Edition, 1996.
3	Non-Conventional Energy Sources	G.D Rai	Khanna Publishers	2003
<b>Reference Books</b>				
1	Renewable Energy Sources and Conversion Technology	N.K.Bansal, Manfred Kleeman&MechaelMeliss	Tata McGraw Hill.	2004
2	Renewable Energy Technologies	Ramesh R & Kumar K U	Narosa Publishing House New Delhi	
3	Conventional Energy Systems	K M, Non	Wheeler Publishing Co. Ltd., New Delhi	2003



**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER – VI**  
**Professional Elective 1**

**ENERGY AND ENVIRONMENT**

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

**Course Learning Objectives:**

- To understand the fundamentals of energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies.
- To introduce various aspects of environmental pollution and its control.
- To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc.
- To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.

**Module-1**

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.

**Module-2**

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.

**Module-3**

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.

**Module-4**

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.

**Module-5**

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.

**Group assignments:**

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.

**Course Outcomes:** 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



## CRITERION 1: CURRICULAR ASPECTS

### Key Indicator- 1.3 Curriculum Enrichment

**Metric 1.3.1:** Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum

ACADEMIC YEAR 2022-23

### Department of Artificial Intelligence & Machine Learning

Sl. No.	Professional Ethics		Total No. of Courses
	Course Code	Course Name	
1.	21CIP47	Constitution of India and Professional Ethics	07
2.	18CS51	Management, Entrepreneurship for IT Industry	
<b>Human Values</b>			
3.	21SCR36	Social Connect and Responsibility	
4.	21UHV49	Universal Human Values	
<b>Environment &amp; Sustainability</b>			
5.	18CIV59	Environmental Studies	
6.	18ME651	Non-Conventional Energy Sources	
7.	18ME751	Energy and Environment	

<b>Constitution of India and Professional Ethics (CIP)</b>			
Course Code	<b>21CIP37/47</b>	CIE Marks	<b>50</b>
Teaching Hours/Week (L:T:P: S)	<b>L:0,T:2,P:0 = 02 Hours</b>	SEE Marks	<b>50</b>
Total Hours of Pedagogy	<b>02 Hours/Week</b>	Total Marks	<b>100</b>
Credits	<b>01</b>	Exam Hours	<b>01 Hours</b>
<p><b>Course objectives:</b> This course will enable the students 1.</p> <ol style="list-style-type: none"> <li>To know about the basic structure of Indian Constitution.</li> <li>2. To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.</li> <li>3. To know about our Union Government, political structure &amp; codes, procedures.</li> <li>4. To know the State Executive &amp; Elections system of India.</li> <li>5. To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.</li> </ol>			
<p><b>Teaching-Learning Process</b></p> <p>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></p> <p>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.		

CO4	Understand our State Executive & Elections system of India.
CO5	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.

**MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY**  
**[As per Choice Based Credit System (CBCS) scheme] (Effective from**  
**the academic year 2016 -2017)**  
**SEMESTER – V**

Subject Code	<b>15CS51</b>	IA Marks	20
Number of Lecture Hours/Week	4	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03
<b>CREDITS – 04</b>			
<b>Course objectives:</b> This course will enable students to			
<ul style="list-style-type: none"> <li>• Explain the principles of management, organization and entrepreneur.</li> <li>• Discuss on planning, staffing, ERP and their importance</li> <li>• Infer the importance of intellectual property rights and relate the institutional support</li> </ul>			
<b>Module – 1</b>			<b>Teaching Hours</b>
<b>Introduction</b> - Meaning, nature and characteristics of management, scope and Functional areas of management, goals of management, levels of management, brief overview of evolution of management theories,. Planning- Nature, importance, types of plans, steps in planning, Organizing- nature and purpose, types of Organization, Staffing- meaning, process of recruitment and selection			<b>10 Hours</b>
<b>Module – 2</b>			
<b>Directing and controlling-</b> meaning and nature of directing, leadership styles, motivation Theories, Communication- Meaning and importance, Coordination- meaning and importance, Controlling- meaning, steps in controlling, methods of establishing control.			<b>10 Hours</b>
<b>Module – 3</b>			
<b>Entrepreneur</b> – meaning of entrepreneur, characteristics of entrepreneurs, classification and types of entrepreneurs, various stages in entrepreneurial process, role of entrepreneurs in economic development, entrepreneurship in India and barriers to entrepreneurship. Identification of business opportunities, market feasibility study, technical feasibility study, financial feasibility study and social feasibility study.			<b>10 Hours</b>
<b>Module – 4</b>			
<b>Preparation of project and ERP</b> - meaning of project, project identification, project selection, project report, need and significance of project report, contents, formulation, guidelines by planning commission for project report, <b>Enterprise Resource Planning: Meaning and Importance-</b> ERP and Functional areas of Management – Marketing / Sales- Supply Chain Management – Finance and Accounting – Human Resources – Types of reports and methods of report generation			<b>10 Hours</b>
<b>Module – 5</b>			

<p><b>Micro and Small Enterprises:</b> Definition of micro and small enterprises, characteristics and advantages of micro and small enterprises, steps in establishing micro and small enterprises, Government of India industrial policy 2007 on micro and small enterprises, case study (Microsoft), Case study (Captain G R Gopinath), case study (N R Narayana Murthy &amp; Infosys), <b>Institutional support:</b> MSME-DI, NSIC, SIDBI, KIADB, KSSIDC, TECSOK, KSFC, DIC and District level single window agency, <b>Introduction to IPR.</b></p>	<p><b>10 Hours</b></p>
<p><b>Course outcomes:</b> The students should be able to:</p>	
<ul style="list-style-type: none"> <li>• Define management, organization, entrepreneur, planning, staffing, ERP and outline</li> </ul>	

<ul style="list-style-type: none"> <li>• their importance in entrepreneurship</li> <li>• Utilize the resources available effectively through ERP</li> <li>• Make use of IPRs and institutional support in entrepreneurship</li> </ul>
<p><b>Question paper pattern:</b>  The question paper will have TEN questions.  There will be TWO questions from each module.  Each question will have questions covering all the topics under a module.  The students will have to answer FIVE full questions, selecting ONE full question from each module.</p>
<p><b>Text Books:</b></p>
<ol style="list-style-type: none"> <li>1. Principles of Management -P. C. Tripathi, P. N. Reddy; Tata McGraw Hill, 4th / 6<sup>th</sup> Edition, 2010.</li> <li>2. Dynamics of Entrepreneurial Development &amp; Management -Vasant Desai Himalaya Publishing House.</li> <li>3. Entrepreneurship Development -Small Business Enterprises -Poornima M Charantimath Pearson Education – 2006.</li> <li>4. Management and Entrepreneurship - Kanishka Bedi- Oxford University Press-2017</li> </ol>
<p><b>Reference Books:</b></p>
<ol style="list-style-type: none"> <li>1. Management Fundamentals -Concepts, Application, Skill Development Robert Lusier – Thomson.</li> <li>2. Entrepreneurship Development -S S Khanka -S Chand &amp; Co.</li> <li>3. Management -Stephen Robbins -Pearson Education /PHI -17th Edition, 2003</li> </ol>



<b>SOCIAL CONNECT &amp; RESPONSIBILITIES</b>			
<b>Course Code</b>	<b>21SCR36</b>	<b>CIE Marks</b>	<b>50</b>
Teaching Hours week (L:T:P:S)	1: 0: 0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	03
Department	Management Studies / Engineering Department		
Offered for	3 <sup>rd</sup> Semester		
Prerequisite	Nil		
<p><b>Objectives:</b> The Course will</p> <ul style="list-style-type: none"> <li>• Enable the student to do a deep drive into societal challenges being addressed by NGO(s), social enterprises &amp; The government and build solutions to alleviate these complex social problems through immersion, design &amp; technology.</li> <li>• Provide a formal platform for students to communicate and connect with their surroundings.</li> <li>• Enable to create of a responsible connection with society.</li> </ul>			
<p><b>Learning Outcomes:</b> The students are expected to have the ability to :</p> <ol style="list-style-type: none"> <li>1. Understand social responsibility</li> <li>2. Practice sustainability and creativity</li> <li>3. Showcase planning and organizational skills</li> </ol>			
<p><b>Contents:</b></p> <p>The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large. The course will engage students in interactive sessions, open mic, reading groups, storytelling sessions, and semester-long activities conducted by faculty mentors. In the following a set of activities planned for the course have been listed :</p>			
<b>Module-I</b>			
<p><b>Plantation and adoption of a tree:</b> Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.</p>			
<b>Module-II</b>			
<p><b>Heritage walk and crafts corner:</b> Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.</p>			
<b>Module-III</b>			
<p><b>Organic farming and waste management:</b> usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus.</p>			

<b>Module-IV</b>
<b>Water Conservation:</b> knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.
<b>Module-V</b>
<b>Food Walk</b> City's culinary practices, food lore, and indigenous materials of the region used in cooking.
<p><b>Activities</b></p> <p><b>Jamming session, open mic, and poetry:</b> Platform to connect to others. Share the stories with others. <b>Share the experience of Social Connect.</b> Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.</p> <p><b>PEDAGOGY</b></p> <p>The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersion with NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?</p> <p><b>COURSE TOPICS:</b></p> <p>The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversational will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.</p> <p>A total of 14-20 hrs engagement per semester is required for the 3<sup>rd</sup> semester of the B.E. /B.Tech. program. The students will be divided into 10 groups of 35 each. Each group will be handled by two <b>faculty mentors</b>. Faculty mentors will design the activities (particularly Jamming sessions open mic ,and poetry)</p> <p><b>Faculty mentors</b> has to design the evaluation system.</p>

**Guideline for Assessment Process:  
Continuous Internal Evaluation (CIE)**

After completion of, the social connect, the student shall prepare, with daily **diary** as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period. The report should be signed by the mentor. The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed. Marks allotted for the diary are out of 50.

- Planning and scheduling the social connect
- Information/Data collected during the social connect
- Analysis of the information/data and report writing

Considering all above points allotting the marks as mentioned below-

Excellent	80 to 100
Good	60 to 79
Satisfactory	40 to 59
Unsatisfactory and fail	<39

**Semester End Examination (SEE)**

This Jamming session will be conducted at the end of the course for **50 marks**

Jamming session includes -Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art painting, and fine art.

Faculty mentor has to design the evaluation system for the Jamming session.

Pedagogy (Guidelines) may differ depending on local resources available for the study

Module	Topic	Content	Group Size	Location	Magnitude	Activity	Reporting	Evaluation
I	Plantation and adoption of a tree	Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	03 – 05	Farmers Land or Road side or Community area or institution's campus, any one location to be selected.	One  Students must monitor it for three years	Site selection  Select suitable species in consultation with horticulture, forest or agriculture department. Interact with NGO/Industry and community to plant Tag the plant for continuous monitoring	Report shall be handwritten or blog with paintings, sketches, poster, video and/or photograph with Geo tag.	Each module is evaluated for 50 Marks and average of all the five modules will be the final marks.  <b>CIE Rubrics for 50 M</b>  Planning and scheduling the social connect – 15 M  Information/Data collected during the social connect – 15 M  Analysis of the information/dat
II	Heritage walk and crafts corner	Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.	03 - 05	Preferably Within the city where institution is located or home town of the student group	One or two  One can be a structure or a heritage building the other can be heritage custom or practise	Survey in the form of questioner by connecting to the people and asking. No standard questioner to be given by faculty and has to be evolved involving students. Questions during survey can be asked in local language but report language is English.		

III	Waste management	Wet waste management in neighbouring villages, and implementation in the campus.	03 - 05 More than one group can be	Preferably in the nearby villages and within the campus.	One	Report on importance and benefits of Waste management. Report on segregation, collection, transportation and disposal.	a and report writing – 20 M  <b>SEE 50 M:</b> Presentation, Jamming session, Open mic, Group
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			assigned one task based on magnitude of task.			Suggestion for composting.  Visit nearby village/location to sensitize farmers and public about waste management and also document current practises.	discussion and debate.
III	Organic farming	Usefulness of organic farming in neighbouring villages, and implementation in the campus.	03 – 05	Visit to farming lands where organic farming is going on  Campus Garden  Roof top Garden or Vertical Garden or hydroponics if land is scarce.	One	Collect data on organic farming in the vicinity. Like types of crop, methodology etc.,.  Suggestion for implementation at selected locations	

IV	Water Conservation	Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.	03 – 05	Rain water harvesting demonstration available in the campus or surroundings	One	Visit lakes/pond/river/dry well to involve on rejuvenation activity.  Or  Assessment of Water budget in the campus/village		
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						Report on traditional water conservation practices (to minimize wastage)		
V	Food Walk	City's culinary practices, food lore, and indigenous materials of the region used in cooking.	03 - 05	Within the city where institution is located  Food culture of student's resident region	One	Survey local food centres and identify the speciality  Identify and study the food ingredients  Report on the regional foods  Report on Medicinal values of the local food grains, and plants.		

\*\*Important recommendations requested; Special Appreciation from institution and university for students who take care of plants for three years.

## IV Semester

### UNIVERSAL HUMAN VALUES-II: UNDERSTANDING HARMONY and ETHICAL HUMAN CONDUCT

Title of the subject

Course Code	<b>21UHV49</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	2:0:0	SEE Marks	50
Total Hours of Pedagogy	20	Total Marks	100
Credits	01	Exam Hours	01

#### Course objectives:

This introductory course input is intended:

1. 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.
2. 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.
3. 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 orientational input in value education to the young enquiring minds.

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

These are sample Strategies, which teacher 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-a-vis the rest of existence.
2. The course is in the form of 20 lectures (discussions)
3. It is free from any dogma or value prescriptions.
4. It is a process of self-investigation and self-exploration, and not of giving sermons. Whatever is found as truth or reality is stated as a proposal and the students are facilitated to verify it in their own right, based on their Natural Acceptance and subsequent Experiential Validation – the whole existence is the lab and every activity is a source of reflection.
5. 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 self-evolution.
6. This self-exploration also enables them to critically evaluate their pre-conditionings and present beliefs.

#### Module-1

##### Introduction to Value Education (4 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

<b>Teaching-Learning Process</b>	Introduction to Value Education- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
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### **Module-2**

#### **Harmony in the Human Being (4 hours)**

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

<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
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### **Module-3**

#### **Harmony in the Family and Society (4 hours)**

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

<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
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### **Module-4**

#### **Harmony in the Nature/Existence (4 hours)**

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

<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
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### **Module-5**

#### **Implications of the Holistic Understanding – a Look at Professional Ethics (4 hours)**

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

<b>Teaching-Learning Process</b>	Introduction to the concepts- Chalk and talk method, Discussion, Sharing of experiences, Live Examples and videos
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### Course outcome (Course Skill Set)

By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). 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.

Therefore, the course and further follow up is expected to positively impact common graduate attributes like:

1. Holistic vision of life
2. Socially responsible behaviour
3. Environmentally responsible work
4. Ethical human conduct
5. Having Competence and Capabilities for Maintaining Health and Hygiene
6. Appreciation and aspiration for excellence (merit) and gratitude for all

### 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**

(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 01 hours)**

1. The question paper will have 50 questions. Each question is set for 01 marks.
2. The students have to answer all the questions, selecting one full question from each module

**Suggested Learning Resources:****Books -READINGS:****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, 2<sup>nd</sup> Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034- 47-1

## b. The Teacher's Manual

Teachers' Manual for *A Foundation Course in Human Values and Professional Ethics*, R R Gaur, R Asthana, G

**Reference Books**

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 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 Nagaraj, 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):**

1. Value Education websites, <https://www.uhv.org.in/uhv-ii>, <http://uhv.ac.in>, <http://www.uptu.ac.in>
2. **Story of Stuff**, <http://www.storyofstuff.com>
3. **Al Gore, An Inconvenient Truth**, Paramount Classics, USA
4. **Charlie Chaplin, Modern Times**, United Artists, USA
5. **IIT Delhi, Modern Technology – the Untold Story**
6. Gandhi A., Right Here Right Now, Cyclewala Productions
7. [https://www.youtube.com/channel/UCQxWr5QB\\_eZUnwxSwxXE\\_kQw](https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXE_kQw)
8. <https://fdp-siaic-te-india.org/8dayUHVdownload.php>
9. <https://www.youtube.com/watch?v=8ovkLRYXijE>
10. <https://www.youtube.com/watch?v=OgdNx0X923I>
11. <https://www.youtube.com/watch?v=nGRcbRpvGoU>
12. <https://www.youtube.com/watch?v=sDxGXOgYEKM>

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

B.E IN CIVIL ENGINEERING(CV-2018-19)				
Outcome Based Education (OBE) and Choice Based Credit System (CBCS) 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. <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. <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. <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. <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 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>				
<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& PiyushMalaviya	Acme Learning Pvt. Ltd. New Delhi.	1 <sup>st</sup> Edition

**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER –VI**  
**OPEN ELECTIVE A**

**NON CONVENTIONAL ENERGY SOURCES**

Course Code	<b>18ME651</b>	CIE Marks	40
Teaching Hours/Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

**Course Learning Objectives:**

- To introduce the concepts of solar energy, its radiation, collection, storage and application.
- To introduce the concepts and applications of Wind energy, Biomass energy, Geothermal energy and Ocean energy as alternative energy sources.
- To explore society's present needs and future energy demands.
- To examine energy sources and systems, including fossil fuels and nuclear energy, and then focus on alternate, renewable energy sources such as solar, biomass (conversions), wind power, geothermal, etc.
- To get exposed to energy conservation methods.

**Module-1**

**Introduction:** Energy source, India's production and reserves of commercial energy sources, need for non-conventional energy sources, energy alternatives, solar, thermal, photovoltaic. Water power, wind biomass, ocean temperature difference, tidal and waves, geothermal, tar sands and oil shale, nuclear (Brief descriptions); advantages and disadvantages, comparison (Qualitative and Quantitative).

**Solar Radiation:** Extra-Terrestrial radiation, spectral distribution of extra terrestrial radiation, solar constant, solar radiation at the earth's surface, beam, diffuse and global radiation, solar radiation data.

**Measurement of Solar Radiation:** Pyrometer, shading ring pyrheliometer, sunshine recorder, schematic diagrams and principle of working.

**Module-2**

**Solar Radiation Geometry:** Flux on a plane surface, latitude, declination angle, surface azimuth angle, hour angle, zenith angle, solar altitude angle expression for the angle between the incident beam and the normal to a plane surface (No derivation) local apparent time. Apparent motion of sun, day length, numerical examples.

**Radiation Flux on a Tilted Surface:** Beam, diffuse and reflected radiation, expression for flux on a tilted surface (no derivations) numerical examples.

**Solar Thermal Conversion:** Collection and storage, thermal collection devices, liquid flat plate collectors, solar air heaters concentrating collectors (cylindrical, parabolic, paraboloid) (Quantitative analysis); sensible heat storage, latent heat storage, application of solar energy water heating. Space heating and cooling, active and passive systems, power generation, refrigeration. Distillation (Qualitative analysis) solar pond, principle of

**Module-3**

**Performance Analysis of Liquid Flat Plate Collectors:** General description, collector geometry, selective surface (qualitative discussion) basic energy-balance equation, stagnation temperature, transmissivity of the cover system, transmissivity – absorptivity product, numerical examples. The overall loss coefficient, correlation for the top loss coefficient, bottom and side loss coefficient, problems (all correlations to be provided). Temperature distribution between the collector tubes, collector heat removal factor, collector efficiency factor and collector flow factor, mean plate temperature, instantaneous efficiency (all expressions to be provided). Effect of various parameters on the collector performance; collector orientation, selective surface, fluid inlet temperature, number covers, dust.

**Photovoltaic Conversion:** Description, principle of working and characteristics, application.

**Module-4**

**Wind Energy** : Properties of wind, availability of wind energy in India, wind velocity and power from wind; major problems associated with wind power, wind machines; Types of wind machines and their characteristics, horizontal and vertical axis wind mills, elementary design principles; coefficient of performance of a wind mill rotor, aerodynamic considerations of wind mill design, numerical examples.

**Tidal Power:** Tides and waves as energy suppliers and their mechanics; fundamental characteristics of tidal power, harnessing tidal energy, limitations.

**Ocean Thermal Energy Conversion:** Principle of working, Rankine cycle, OTEC power stations in the world, problems associated with OTEC.

#### Module-5

**Geothermal Energy Conversion:** Principle of working, types of geothermal station with schematic diagram, geothermal plants in the world, problems associated with geothermal conversion, scope of geothermal energy.

**Energy from Bio Mass:** Photosynthesis, photosynthetic oxygen production, energy plantation, bio gas production from organic wastes by anaerobic fermentation, description of bio-gas plants, transportation of bio-gas, problems involved with bio-gas production, application of bio-gas, application of bio-gas in engines, advantages.

**Hydrogen Energy:** Properties of Hydrogen with respected to its utilization as a renewable form of energy, sources of hydrogen, production of hydrogen, electrolysis of water, thermal decomposition of water, thermo chemical production bio-chemical production.

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

CO1: Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.

CO2: Know the need of renewable energy resources, historical and latest developments.

CO3: Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.

CO4: Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.

CO5: Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications

CO6: Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.

CO7: Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications.

#### 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	Non-Convention Energy Resources	B H Khan	McGraw Hill Education (India) Pvt. Ltd.	3 <sup>rd</sup> Edition
2	Solar energy	Subhas P Sukhatme	Tata McGraw Hill	2 <sup>nd</sup> Edition, 1996.
3	Non-Conventional Energy Sources	G.D Rai	Khanna Publishers	2003

**Reference Books**

1	Renewable Energy Sources and Conversion Technology	N.K.Bansal, Manfred Kleeman&MechaelMeliss	Tata McGraw Hill.	2004
2	Renewable Energy Technologies	Ramesh R & Kumar K U	Narosa Publishing House New Delhi	
3	Conventional Energy Systems	K M, Non	Wheeler Publishing Co. Ltd., New Delhi	2003



**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER – VI**  
**Professional Elective 1**

**ENERGY AND ENVIRONMENT**

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

**Course Learning Objectives:**

- To understand the fundamentals of energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies.
- To introduce various aspects of environmental pollution and its control.
- To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc.
- To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.

**Module-1**

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.

**Module-2**

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.

**Module-3**

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.

**Module-4**

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.

**Module-5**

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.

**Group assignments:**

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.

**Course Outcomes:** 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

**CRITERION 1 – CURRICULAR ASPECTS**
**Key Indicator – 1.3 Curriculum Enrichment**
**Metric Number: 1.3.1**

**Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum**

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**
**ACADEMIC YEAR 2022-23**

SL NO.	Professional Ethics		Total No. of Courses
	COURSE CODE	COURSE NAME	
1	21CIP37/47	Constitution of India, Professional Ethics	04
2	18ES51	Technological Innovation Management & Entrepreneurship	
<b>Human Values</b>			
3	21SCR36	Social Connect & Responsibility	
<b>Environment &amp; Sustainability</b>			
4	18CIV59	Environmental Studies	

## 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.

**B. E. 2018 Scheme Fifth Semester Syllabus (EC / TC)**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**

**SEMESTER – V**

**TECHNOLOGICAL INNOVATION MANAGEMENT AND  
ENTREPRENEURSHIP**

Course Code	<b>: 18ES51</b>	CIE Marks : 40
Lecture Hours/Week	:03	SEE Marks : 60
Total Number of Lecture Hours : 40 (08 Hours / Module)		Exam Hours : 03
<b>CREDITS 03</b>		

**Course Learning Objectives:** This course will enable students to:

- Understand basic skills of Management
- Understand the need for Entrepreneurs and their skills
- Identify the Management functions and Social responsibilities
- Understand the Ideation Process, creation of Business Model, Feasibility Study and sources of funding

**Module-1**

**Management:** Nature and Functions of Management – Importance, Definition, Management Functions, Levels of Management, Roles of Manager, Managerial Skills, Management & Administration, Management as a Science, Art & Profession (**Selected topics of Chapter 1, Text 1**).

**Planning:** Planning–Nature, Importance, Types, Steps and Limitations of Planning; Decision Making – Meaning, Types and Steps in Decision Making (**Selected topics from Chapters 4 & 5, Text 1**). **L1,L2**

**Module-2**

**Organizing and Staffing: Organization**–Meaning, Characteristics, Process of Organizing, Principles of Organizing, Span of Management (meaning and importance only), Departmentalisation, Committees–Meaning, Types of Committees; Centralization Vs Decentralization of Authority and Responsibility; **Staffing**–Need and Importance, Recruitment and Selection Process (**Selected topics from Chapters 7, 8 & 11, Text 1**).

**Directing and Controlling:** Meaning and Requirements of Effective Direction, Giving Orders; Motivation–Nature of Motivation, Motivation Theories (Maslow’s Need-Hierarchy Theory and Herzberg’s Two Factor Theory); Communication – Meaning, Importance and Purposes of Communication; Leadership–Meaning, Characteristics, Behavioural Approach of Leadership;

Coordination-Meaning, Types, Techniques of Coordination; Controlling – Meaning, Need for Control System, Benefits of Control, Essentials of Effective Control System, Steps in Control Process  
(Selected topics from Chapters 15 to 18 and 9, Text 1). L1,L2

### Module-3

**Social Responsibilities of Business:** Meaning of Social Responsibility, Social Responsibilities of Business towards Different Groups, Social Audit, Business Ethics and Corporate Governance (Selected topics from Chapter 3, Text 1).

**Entrepreneurship:** Definition of Entrepreneur, Importance of Entrepreneurship, concepts of Entrepreneurship, Characteristics of successful Entrepreneur, Classification of Entrepreneurs, Myths of Entrepreneurship, Entrepreneurial Development models, Entrepreneurial development cycle, Problems faced by Entrepreneurs and capacity building for Entrepreneurship (Selected topics from Chapter 2, Text 2). L1,L2

### Module-4

**Family Business:** Role and Importance of Family Business, Contributions of Family Business in India, Stages of Development of a Family Business, Characteristics of a Family-owned Business in India, Various types of family businesses (Selected topics from Chapter 4,(Page 71-75) Text 2).

**Idea Generation and Feasibility Analysis-** Idea Generation; Creativity and Innovation; Identification of Business Opportunities; Market Entry Strategies; Marketing Feasibility; Financial Feasibilities; Political Feasibilities; Economic Feasibility; Social and Legal Feasibilities; Technical Feasibilities; Managerial Feasibility, Location and Other Utilities Feasibilities.(Selected topics from Chapter 6(Page No. 111-117) & Chapter 7(Page No. 140-142), Text 2) L1,L2

### Module-5

**Business model** – Meaning, designing, analyzing and improvising; Business Plan – Meaning, Scope and Need; Financial, Marketing, Human Resource and Production/Service Plan; Business plan Formats; Project report preparation and presentation; Why some Business Plan fails? (Selected topics from Chapter 8 (Page No 159-164, Text 2)

**Financing and How to start a Business?** Financial opportunity identification; Banking sources; Nonbanking Institutions and Agencies; Venture Capital – Meaning and Role in Entrepreneurship; Government Schemes for funding business; Pre launch, Launch and Post launch requirements; Procedure for getting License and Registration; Challenges and Difficulties in Starting an Enterprise(Selected topics from Chapter 7(Page No 147-149), Chapter 5(Page No 93-99) & Chapter 8(Page No. 166-172) Text 2)

**Project Design and Network Analysis:** Introduction, Importance of Network

Analysis, Origin of PERT and CPM, Network, Network Techniques, Need for Network Techniques, Steps in PERT, CPM, Advantages, Limitations and Differences.

**(Selected topics from Chapters 20, Text 3).**

**L1,L2,L3**

**Course Outcomes:** After studying this course, students will be able to:

1. Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business
2. Identify the various organizations' architecture
3. Describe the functions of Managers, Entrepreneurs and their social responsibilities
4. Understand the components in developing a business plan
5. Recognize the various sources of funding and institutions supporting entrepreneurs

**Text Books:**

1. Principles of Management – P.C Tripathi, P.N Reddy, McGraw Hill Education, 6<sup>th</sup> Edition, 2017. ISBN-13:978-93-5260-535-4.
2. Entrepreneurship Development Small Business Enterprises- Poornima M Charantimath, Pearson Education 2008, ISBN 978-81-7758-260-4.
3. Dynamics of Entrepreneurial Development and Management by Vasant Desai. HPH 2007, ISBN: 978-81-8488-801-2.
4. Robert D. Hisrich, Mathew J. Manimala, Michael P Peters and Dean A. Shepherd, "Entrepreneurship", 8<sup>th</sup> Edition, Tata Mc-Graw Hill Publishing Co.Ltd.- New Delhi, 2012

**Reference Book:**

1. Essentials of Management: An International, Innovation and Leadership perspective by Harold Koontz, Heinz Weihrich McGraw Hill Education, 10<sup>th</sup> Edition 2016. ISBN- 978-93-392-2286-4.



<b>SOCIAL CONNECT &amp; RESPONSIBILITIES</b>			
<b>Course Code</b>	<b>21SCR36</b>	<b>CIE Marks</b>	<b>50</b>
Teaching Hours week (L:T:P:S)	1: 0: 0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	03
Department	Management Studies / Engineering Department		
Offered for	3 <sup>rd</sup> Semester		
Prerequisite	Nil		
<b>Objectives:</b> The Course will			
<ul style="list-style-type: none"> <li>• Enable the student to do a deep drive into societal challenges being addressed by NGO(s), social enterprises &amp; The government and build solutions to alleviate these complex social problems through immersion, design &amp; technology.</li> <li>• Provide a formal platform for students to communicate and connect with their surroundings.</li> <li>• Enable to create of a responsible connection with society.</li> </ul>			
<b>Learning Outcomes:</b> The students are expected to have the ability to :			
<ol style="list-style-type: none"> <li>1. Understand social responsibility</li> <li>2. Practice sustainability and creativity</li> <li>3. Showcase planning and organizational skills</li> </ol>			
<b>Contents:</b>			
The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large. The course will engage students in interactive sessions, open mic, reading groups, storytelling sessions, and semester-long activities conducted by faculty mentors. In the following a set of activities planned for the course have been listed :			
<b>Module-I</b>			
<b>Plantation and adoption of a tree:</b> Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.			
<b>Module-II</b>			
<b>Heritage walk and crafts corner:</b> Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.			
<b>Module-III</b>			
<b>Organic farming and waste management:</b> usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus.			
<b>Module-IV</b>			
<b>Water Conservation:</b> knowing the present practices in the surrounding villages and			

implementation in the campus, documentary or photo blog presenting the current practices.

### Module-V

**Food Walk** City's culinary practices, food lore, and indigenous materials of the region used in cooking.

### Activities

**Jamming session, open mic, and poetry:** Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.

### PEDAGOGY

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersion with NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

### COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversational will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

A total of 14-20 hrs engagement per semester is required for the 3<sup>rd</sup> semester of the B.E. /B.Tech. program. The students will be divided into 10 groups of 35 each. Each group will be handled by two **faculty mentors**. Faculty mentors will design the activities (particularly Jamming sessions open mic, and poetry)

**Faculty mentors** has to design the evaluation system.

### Guideline for Assessment Process:

#### Continuous Internal Evaluation (CIE)

After completion of, the social connect, the student shall prepare, with daily **diary** as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period. The report should be signed by the mentor. The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed.

Marks allotted for the diary are out of 50.

Planning and scheduling the social connect

Information/Data collected during the social connect

Analysis of the information/data and report writing

Considering all above points allotting the marks as mentioned below-

Excellent	80 to 100
Good	60 to 79
Satisfactory	40 to 59
Unsatisfactory and fail	<39

APPR-20.09.2022

(Common for B.E. (21SCR36), B. Plan.(21UH36/21SCR36), B.Arch.(21UH39/21SCR36) and B.Sc (21BS39/21SCR36)

**Semester End Examination (SEE)**

This Jamming session will be conducted at the end of the course for **50 marks**

Jamming session includes -Platform to connect to others. Share the stories with others. **Share the experience of Social Connect.** Exhibit the talent like playing instruments, singing, one-act play, art painting, and fine art.

Faculty mentor has to design the evaluation system for the Jamming session.

Pedagogy (Guidelines) may differ depending on local resources available for the study

Module	Topic	Content	Group Size	Location	Magnitude	Activity	Reporting	Evaluation
I	Plantation and adoption of a tree	Plantation of a tree that will be adopted for four years by a group of B.Tech. students. They will also make an excerpt either as a documentary or a photoblog describing the plant's origin, its usage in daily life, and its appearance in folklore and literature.	03 – 05	Farmers Land or Road side or Community area or institution's campus, any one location to be selected.	One  Students must monitor it for three years	Site selection  Select suitable species in consultation with horticulture, forest or agriculture department. Interact with NGO/Industry and community to plant Tag the plant for continuous monitoring	Report shall be handwritten or blog with paintings, sketches, poster, video and/or photograph with Geo tag.	Each module is evaluated for 50 Marks and average of all the five modules will be the final marks.  <b>CIE Rubrics for 50 M</b>  Planning and scheduling the social connect – 15 M  Information/Data collected during the social connect – 15 M  Analysis of the information/data and report writing – 20 M
II	Heritage walk and crafts corner	Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photoblog and documentary on evolution and practice of various craft forms.	03 - 05	Preferably Within the city where institution is located or home town of the student group	One or two  One can be a structure or a heritage building the other can be heritage custom or practise	Survey in the form of questioner by connecting to the people and asking. No standard questioner to be given by faculty and has to be evolved involving students. Questions during survey can be asked in local language but report language is English.		
III	Waste management	Wet waste management in neighbouring villages, and implementation in the campus.	03 - 05  More than one group can be	Preferably in the nearby villages and within the campus.	One	Report on importance and benefits of Waste management. Report on segregation, collection, transportation and disposal.		<b>SEE 50 M:</b> Presentation, Jamming session, Open mic, Group

			assigned one task based on magnitude of task.			<p>Suggestion for composting.</p> <p>Visit nearby village/location to sensitize farmers and public about waste management and also document current practises.</p>		discussion and debate.
III	Organic farming	Usefulness of organic farming in neighbouring villages, and implementation in the campus.	03 – 05	<p>Visit to farming lands where organic farming is going on</p> <p>Campus Garden</p> <p>Roof top Garden or Vertical Garden or hydroponics if land is scarce.</p>	One	<p>Collect data on organic farming in the vicinity. Like types of crop, methodology etc.,.</p> <p>Suggestion for implementation at selected locations</p>		
IV	Water Conservation	Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photo blog presenting the current practices.	03 – 05	Rain water harvesting demonstration available in the campus or surroundings	One	<p>Visit lakes/pond/river/dry well to involve on rejuvenation activity.</p> <p>Or</p> <p>Assessment of Water budget in the campus/village</p>		

						Report on traditional water conservation practices (to minimize wastage)		
V	Food Walk	City's culinary practices, food lore, and indigenous materials of the region used in cooking.	03 - 05	Within the city where institution is located  Food culture of student's resident region	One	Survey local food centres and identify the speciality  Identify and study the food ingredients  Report on the regional foods  Report on Medicinal values of the local food grains, and plants.		

\*\*Important recommendations requested; Special Appreciation from institution and university for students who take care of plants for three years.

**B.E IN CIVIL ENGINEERING(CV-2018-19)**  
**Outcome Based Education (OBE) and Choice Based Credit System (CBCS)**  
**SEMESTER – V**

**ENVIRONMENTAL STUDIES**

Course Code	<b>18CIV59</b>	CIE Marks	40
Teaching Hours / Week (L:T:P)	(1:0:0)	SEE Marks	60
Credits	01	Exam Hours	02

**Module - 1**

**Ecosystems** (Structure and Function): Forest, Desert, Wetlands, Riverine, Oceanic and Lake.  
**Biodiversity:** Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation.

**Module - 2**

**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, Cloud Seeding, and Carbon Trading.

**Module - 3**

**Environmental Pollution** (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution.  
**Waste Management & Public Health Aspects:** Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge.

**Module - 4**

**Global Environmental Concerns** (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.

**Module - 5**

**Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications):** G.I.S. & 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.

**Course outcomes:** At the end of the course, students will be able to:

- CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
- CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
- CO3: Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
- CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

**Question paper pattern:**

- The Question paper will have 100 objective questions.
- Each question will be for 01 marks
- Student will have to answer all the questions in an OMR Sheet.
- The Duration of Exam will be 2 hours.

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 & PiyushMalaviya	Acme Learning Pvt. Ltd. New Delhi.	1 <sup>st</sup> Edition





## CRITERION 1 – CURRICULAR ASPECTS

### Key Indicator- 1.3 Curriculum Enrichment

#### Metric Number: 1.3.1

**Institution integrates crosscutting issues relevant to professional Ethics, Gender Human Values, Environment and Sustainability in transacting the curriculum**

**Department of Mechanical Engineering**

**Academic Year 22-23**

Sl. No.	Professional Ethics		Total No. of Courses
	Course Code	Course Name	
1.	21UH36	Social Connect and Responsibility	<b>04</b>
	<b>Human Values</b>		
2.	21CIP37/47	Constitution of India and Professional Ethics	
3.	21UH49	Universal Human Values	
	<b>Environment &amp; Sustainability</b>		
4.	18CIV59	Environmental Studies	



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## 21UH36 – Social Connect & Responsibility

Course Code	<b>21UH36</b>	CIE Marks	100
Teaching Hours/Week (L:T:P: S)	0:0:3:1	SEE Marks	-----
Total Hours of Pedagogy	40 hour Practical Session +15 hour Planning	Total Marks	100
Examination nature (No SEE – Only CIE)	For CIE Assessment - Activities Report Evaluation by College NSS Officer / HOD / Sports Dept / Any Dept.		
Credits	01 - Credit		

**Course objectives:** The course will enable the students to:

1. Provide a formal platform for students to communicate and connect to the surrounding.
2. create a responsible connection with the society.
3. Understand the community in general in which they work.
4. Identify the needs and problems of the community and involve them in problem –solving.
5. Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.
6. Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.

### General Instructions - Pedagogy :

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

1. 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 social and cultural skills.
2. State the need for activities and its present relevance in the society and Provide real-life examples.
3. Support and guide the students for self-planned activities.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students’ progress in real activities in the field.
5. Encourage the students for group work to improve their creative and analytical skills.

### Contents :

The course is mainly activity-based that will offer a set of activities for the student that enables them to connect with fellow human beings, nature, society, and the world at large.

The course will engage students for interactive sessions, open mic, reading group, storytelling sessions, and semester-long activities conducted by faculty mentors.

In the following a set of activities planned for the course have been listed:

## Social Connect & Responsibility – Contents

### Part I:

#### Plantation and adoption of a tree:

Plantation of a tree that will be adopted for four years by a group of BE / B.Tech students. (ONE STUDENT ONE TREE) They will also make an excerpt either as a documentary or a photo blog describing the plant’s origin, its usage in daily life, its appearance in folklore and literature – – Objectives, Visit, case study, report, outcomes.

### Part II :

#### Heritage walk and crafts corner:

Heritage tour, knowing the history and culture of the city, connecting to people around through their history, knowing the city and its craftsman, photo blog and documentary on evolution and practice of various craft forms - -



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Objectives, Visit, case study, report, outcomes

## Part III :

### Organic farming and waste management:

Usefulness of organic farming, wet waste management in neighboring villages, and implementation in the campus  
Objectives, Visit, case study, report, outcomes.

## Part IV:

### Water conservation:

Knowing the present practices in the surrounding villages and implementation in the campus, documentary or photoblog presenting the current practices – Objectives, Visit, case study, report, outcomes.

## Part V :

### Food walk:

City's culinary practices, food lore, and indigenous materials of the region used in cooking – Objectives, Visit, case study, report, outcomes.

## Course outcomes (Course Skill Set):

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

CO1: Communicate and connect to the surrounding.

CO2: Create a responsible connection with the society.

CO3: Involve in the community in general in which they work.

CO4: Notice the needs and problems of the community and involve them in problem –solving.

CO5: Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems.

CO6: Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.

Activities:

Jamming session, open mic, and poetry: Platform to connect to others. Share the stories with others. Share the experience of Social Connect. Exhibit the talent like playing instruments, singing, one-act play, art-painting, and fine art.

## PEDAGOGY:

The pedagogy will include interactive lectures, inspiring guest talks, field visits, social immersion, and a course project. Applying and synthesizing information from these sources to define the social problem to address and take up the solution as the course project, with your group. Social immersion with NGOs/social sections will be a key part of the course. Will all lead to the course project that will address the needs of the social sector?

## COURSE TOPICS:

The course will introduce social context and various players in the social space, and present approaches to discovering and understanding social needs. Social immersion and inspiring conversational will culminate in developing an actual, idea for problem-based intervention, based on an in-depth understanding of a key social problem.

Duration :

A total of 40 - 50 hrs engagement per semester is required for the 3rd semester of the B.E.

/B.Tech. program. The students will be divided into groups. Each group will be handled by faculty mentor. Faculty mentor will design the activities (particularly Jamming sessions open mic ,and poetry) Faculty mentors has to design the evaluation system as per VTU guidelines of scheme & syllabus.



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Guideline for Assessment Process:

Continuous Internal Evaluation (CIE):

After completion of the course, the student shall prepare, with daily diary as reference, a comprehensive report in consultation with the mentor/s to indicate what he has observed and learned in the social connect period. The report should be signed by the mentor. The report shall be evaluated on the basis of the following criteria and/or other relevant criteria pertaining to the activity completed. Marks allotted for the diary are out of 50. Planning and scheduling the social connect Information/Data collected during the social connect Analysis of the information/data and report writing Considering all above points allotting the marks as mentioned below

Excellent : 80 to 100  
Good : 60 to 79  
Satisfactory : 40 to 59  
Unsatisfactory and fail : <39

Special Note :

**NO SEE – Semester End Exam – Completely Practical and activities based evaluation**

Pedagogy – Guidelines :

It may differ depending on local resources available for the study as well as environment and climatic differences, location and time of execution.

Sl No	Topic	Group size	Location	Activity execution	Reporting	Evaluation Of the Topic
1.	Plantation and adoption of a tree:	May be individual or team	Farmers land/ parks / Villages / roadside/ community area / College campus etc.....	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by Faculty
2.	Heritage walk and crafts corner:	May be individual or team	Temples / monumental places / Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers/ campus etc.....	Site selection /proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by Faculty
3.	Organic farming and waste management:	May be individual or team	Farmers land / parks / Villages visits / roadside/ community area / College campus etc.....	Group selection / proper consultation / Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by Faculty
4.	Water conservation: & conservation techniques	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Government Schemes officers / campus etc.....	site selection / proper consultation/Continuous monitoring/ Information board	Report should be submitted by individual to the concerned evaluation authority	Evaluation as per the rubrics Of scheme and syllabus by Faculty

5.	Food walk: Practices in society	May be individual or team	Villages/ City Areas / Grama panchayat/ public associations/Govern me nt Schemes campus etc.....	Group selection / proper consultation / Continuous monitoring / Information board	Report should be submitted by individual to the concerned evaluation	Evaluation as per the Of scheme syllabus by Faculty
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Plan of Action (Execution of Activities )

Sl.NO	Practice Session Description	
1	Lecture session in field to start activities	
2	Students Presentation on Ideas	
3	Commencement of activity and its progress	
4	Execution of Activity	
5	Execution of Activity	
6	Execution of Activity	
7	Execution of Activity	
8	Case study based Assessment, Individual performance	
9	Sector/ Team wise study and its consolidation	
10	Video based seminar for 10 minutes by each student At the end of semester with Report.	
<input type="checkbox"/> Each student should do activities according to the scheme and syllabus. <input type="checkbox"/> At the end of semester student performance has to be evaluated by the faculty for the assigned activity progress and its completion. <input type="checkbox"/> At last consolidated report of all activities from 1 <sup>st</sup> to 5 <sup>th</sup> , compiled report should be submitted as per the instructions and scheme.		
Assessment Details for CIE (both CIE and SEE)		
Weightage	CIE – 100%	<input type="checkbox"/> Implementation strategies of the project (NSS work). <input type="checkbox"/> The last report should be signed by NSS Officer, the HOD and principal. <input type="checkbox"/> At last report should be evaluated by the NSS officer of the institute. <input type="checkbox"/> Finally the consolidated marks sheet should be sent to the university and also to be made available at LIC visit.
Field Visit, Plan, Discussion	10 Marks	
Commencement of activities and its progress	20 Marks	
Case study based Assessment Individual performance with report	20 Marks	
Sector wise study & its consolidation 5*5 = 25	25 Marks	
Video based seminar for 10 minutes by each student At the end of semester with Report. <u>Activities 1to5, 5*5=25</u>	25 Marks	
Total marks for the course in each semester	100 Marks	
For each activity, 20 marks CIE will be evaluated for IA marks at the end of semester, Report and assessment copy should be made available in the department.		
Students should present the progress of the activities as per the schedule in the prescribed practical session in the field. There should be positive progress in the vertical order for the benefit of society in general through activities.		



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Course Title:	Constitution of India and Professional Ethics		
Course Code:	21CIP37/47	CIE Marks	50
Course Type (Theory/Practical /Integrated)		SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	1:0:0:0	Exam Hours	01 Theory
Total Hours of Pedagogy	15 hours	Credits	01

### Course objectives :

The course INDIAN CONSTITUTION (22ICO17 / 27) will enable the students,

- To know about the basic structure of Indian Constitution.
- To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.
- To know about our Union Government, political structure & codes, procedures.
- To know the State Executive & Elections system of India.
- To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.

### Teaching-Learning Process

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.

- 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.
- 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.

### Module-1 (03 hours of pedagogy)

Indian Constitution: Necessity of the Constitution, Societies before and after the Constitution adoption. Introduction to the Indian constitution, Making of the Constitution, Role of the Constituent Assembly.

### Module-2 (03 hours of pedagogy)

Salient features of India Constitution. Preamble of Indian Constitution & Key concepts of the Preamble. Fundamental Rights (FR's) and its Restriction and limitations in different Complex Situations. building.

### Module-3 (03 hours of pedagogy)

Directive Principles of State Policy (DPSP's) and its present relevance in Indian society. Fundamental Duties and its Scope and significance in Nation, Union Executive : Parliamentary System, Union Executive – President, Prime Minister, Union Cabinet.

### Module-4 (03 hours of pedagogy)

Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Judicial System of India, Supreme Court of India and other Courts, Judicial Reviews and Judicial Activism.

### Module-5 (03 hours of pedagogy)

State Executive and Governor, CM, State Cabinet, Legislature - VS & VP, Election Commission, Elections & Electoral Process. Amendment to Constitution, and Important Constitutional Amendments till today. Emergency Provisions.

### Course outcome (Course Skill Set)

At the end of the course 22ICO17/27 the student will be able to:

CO1	Analyse the basic structure of Indian Constitution.
CO2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
CO3	know about our Union Government, political structure & codes, procedures.
CO4	Understand our State Executive & Elections system of India.
CO5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.



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**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). The minimum passing mark for the SEE is 35% of the maximum marks (18 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(CIE):**

Two Unit Tests each of 30 Marks (duration 01 hour)

- First test after the completion of 30-40 % of the syllabus
- Second test after completion of 80-90% of the syllabus

One Improvement test before the closing of the academic term may be conducted if necessary. However best two tests out of three shall be taken into consideration

Two assignments each of 20 Marks

The teacher has to plan the assignments and get them completed by the students well before the closing of the term so that marks entry in the examination portal shall be done in time. Formative (Successive) Assessments include Assignments/Quizzes/Seminars/ Course projects/Field surveys/ Case studies/ Hands-on practice (experiments)/Group Discussions/ others.. The Teachers shall choose the types of assignments depending on the requirement of the course and plan to attain the Cos and POs. (to have a 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 /test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

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

**Semester End Examinations (SEE)**

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

**Suggested Learning Resources:**

**Textbook:**

1. "Constitution of India" (for Competitive Exams) - Published by Naidhruva Edutech Learning Solutions, Bengaluru. – 2022.
2. "Introduction to the Constitution of India", (Students Edition.) by Durga Das Basu (DD Basu): Prentice –Hall, 2008.

**Reference Books:**

1. "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.
2. "The Constitution of India" by Merunandan K B: published by Merugu Publication, Second Edition, Bengaluru.
3. "Samvidhana Odu" - for Students & Youths by Justice HN Nagamohan Dhas, Sahayana, kerekon.
4. M.Govindarajan, S.Natarajan, V.S.Senthilkumar, "Engineering Ethics", Prentice –Hall, 2004.





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

- Contents related activities (Activity-based discussions)
- For active participation of students instruct the students to prepare Flowcharts and Handouts
- Organising Group wise discussions Connecting to placement activities
- Quizzes and Discussions
- Seminars and assignments





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<b>Universal Human Values (UHV)</b>		Semester	3 <sup>rd</sup>
Course Code	<b>21UH49</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 MCQ (multiple choice questions).		

## 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



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Harmony in the Human Being : (3 hours) 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
Module-3
Harmony in the Family and Society : (3 hours) 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
Module-4
Harmony in the Nature/Existence : (3 hours) 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
Module-5
Implications of the Holistic Understanding – a Look at Professional Ethics : (3 hours) 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
<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); <ul style="list-style-type: none"><li><input type="checkbox"/> 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><input type="checkbox"/> They would have better critical ability.</li><li><input type="checkbox"/> They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).</li><li><input type="checkbox"/> 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> Expected to positively impact common graduate attributes like: <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>



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## 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 22OB2.4, 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



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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 Govindrajan, 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>



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V Semester

<b>Environmental Studies</b>			
Course Code	<b>18CIV59</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
Course objectives: <ul style="list-style-type: none"> <li><input type="checkbox"/> To create environmental awareness among the students.</li> <li><input type="checkbox"/> To gain knowledge on different types of pollution in the environment.</li> </ul>			
Teaching-Learning Process (General Instructions) These are sample Strategies; which teacher can use to accelerate the attainment of the various course outcomes. <ol style="list-style-type: none"> <li>1. 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>2. Environmental awareness program for the in house campus</li> <li>3. Encourage collaborative (Group Learning) Learning in the class.</li> <li>4. Seminars, surprise tests and Quizzes may be arranged for students in respective subjects to develop skills.</li> </ol>			
Module-1			
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.			
Teaching-Learning Process	Chalk and talk, PowerPoint presentation and animation tools		
Module-2			
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.			
Teaching-Learning Process	Chalk and talk, powerpoint presentation and animation tools		
Module-3			
Environmental Pollution (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies): Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution. Waste Management & Public Health Aspects: Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge.			
Teaching-Learning Process	Chalk and talk, powerpoint presentation and animation tools		
Module-4			





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Global Environmental Concerns (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.

Teaching-Learning Process

Chalk and talk, powerpoint presentation and animation tools

## Module-5

Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications): G.I.S. & 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.

Teaching-Learning Process

Chalk and talk, powerpoint presentation and animation tools

Course outcome (Course Skill Set)

At the end of the course the student will be able to :

- CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
- CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
- CO3: Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
- CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

### 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).



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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 01 hours)

### Question paper pattern:

1. The Question paper will have 50 objective questions.
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

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**CRITERION 1 – CURRICULAR ASPECTS**

**Key Indicator – 1.3 Curriculum Enrichment**

**Metric Number: 1.3.1**

**Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum**

**DEPARTMENT OF CIVIL ENGINEERING**

**ACADEMIC YEAR 2022-23**

**ODD SEMESTER**

SL NO.	Environment & Sustainability		Total No. of Courses
	COURSE CODE	COURSE NAME	
1	18CV732	Air Pollution and Control	02
2	18ME751	Energy And Environment	



<b>B. E. CIVIL ENGINEERING</b>			
<b>Choice Based Credit System (CBCS) and Outcome Based Education (OBE)</b>			
<b>SEMESTER - VII</b>			
<b>AIR POLLUTION AND CONTROL</b>			
Course Code	<b>18CV732</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> This course will enable students to			
<ol style="list-style-type: none"> <li>1. Study the sources and effects of air pollution</li> <li>2. Learn the meteorological factors influencing air pollution.</li> <li>3. Analyze air pollutant dispersion models</li> <li>4. Illustrate particular and gaseous pollution control methods.</li> </ol>			
<b>Module-1</b>			
<b>Introduction:</b> Definition, Sources, classification and characterization of air pollutants. Effects of air pollution on health, vegetation & materials. Types of inversion, photochemical smog.			
<b>Module-2</b>			
<b>Meteorology:</b> Temperature lapse rate & stability, wind velocity & turbulence, plume behavior, measurement of meteorological variables, wind rose diagrams, Plume Rise, estimation of effective stack height and mixing depths.			
<b>Module-3</b>			
<b>Sampling:</b> Sampling of particulate and gaseous pollutants (Stack, Ambient & indoor air pollution), Monitoring and analysis of air pollutants (PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>x</sub> , NO <sub>x</sub> , CO, NH <sub>3</sub> ). Development of air quality models-Gaussian dispersion model-Including Numerical problems.			
<b>Module-4</b>			
<b>Control Techniques:</b> Particulate matter and gaseous pollutants- settling chambers, cyclone separators, scrubbers, filters & ESP - Including Numerical problems. Site selection for industrial plant location.			
<b>Module-5</b>			
Air pollution due to automobiles, standards and control methods. Noise pollution- causes, effects and control, noise standards. Environmental issues, global episodes. Environmental laws and acts.			
<b>Course outcomes:</b> After studying this course, students will be able to:			
<ol style="list-style-type: none"> <li>1. Identify the major sources of air pollution and understand their effects on health and environment.</li> <li>2. Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.</li> <li>3. Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.</li> <li>4. Choose and design control techniques for particulate and gaseous emissions.</li> </ol>			
<b>Question paper pattern:</b>			
<ul style="list-style-type: none"> <li>• The question paper will have ten full questions carrying equal marks.</li> <li>• Each full question will be for 20 marks.</li> <li>• There will be two full questions (with a maximum of four sub- questions) from each module.</li> <li>• Each full question will have sub- question covering all the topics under a module.</li> <li>• The students will have to answer five full questions, selecting one full question from each module.</li> </ul>			
<b>Textbooks:</b>			
<ol style="list-style-type: none"> <li>1. M. N. Rao and H V N Rao, "Air pollution", Tata Mc-G raw Hill Publication.</li> <li>2. H. C. Perkins, "Air pollution". Tata McGraw Hill Publication.</li> <li>3. Mackenzie Davis and David Cornwell, "Introduction t o Environmental Engineering" McGraw-Hill Co.</li> </ol>			
<b>Reference Books:</b>			
<ol style="list-style-type: none"> <li>1. Noel De Nevers, "Air Pollution Control Engineering", Waveland Pr Inc.</li> <li>2. Anjaneyulu Y, "Text book of Air Pollution and Control Technologies", Allied Publishers.</li> </ol>			

<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 <u>Certain Energy Intensive Industries</u>			
<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