



**Lokmanya Tilak Jankalyan Shikshan Sanstha's**  
**PRIYADARSHINI BHAGWATI COLLEGE OF ENGINEERING**  
Harpur Nagar, Umred Road (Near Bada Tajbagh), Nagpur-24  
(Approved by AICTE, New Delhi, Govt. of Maharashtra  
and affiliated to Rashtrasant Tukdoji Maharaj Nagpur University)  
Email: principalpbcoe@gmail.com, Website: www.pbcoe.edu.in  
**NAAC Accredited**



### **Key Indicator 1.3 Curriculum Enrichment**

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

#### **1.3.1 List and Syllabus of courses related to Gender, Human Values, Environment, Sustainability and Professional Ethics**

**Certified Documents from Page Number 2 to Page Number 27**



**Lokmanya Tilak Jankalyan Shikshan Sanstha's  
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### 1.3.1

#### List of courses related to Gender, Human Values, Environment, Sustainability and Professional Ethics

Sr. No	Program Name	Subject	Subject Code
1	B.Tech Second Sem (For All Branches)	Indian Culture & Constitution	BSE-2-8T
2	Civil Engineering	Environmental Engineering	BTCVE403T+P
3	Civil Engineering	Professional Practice, Law & Ethics	BTCVE504T
4	Computer Science & Engineering	Universal Human Values	BECSE306T
5	Computer Science & Engineering	Environment Science	BECSE307T
6	Computer Science & Engineering	Yoga & Meditation	BTECHCSE507T
7	Electronics & Communication Engineering	Universal Human Values	BEET409A
8	Information Technology	Universal Human Values	BTIT307T
9	Information Technology	Environment Science	BTIT308T
10	Information Technology	Organizational Behaviour	BTIT608T
11	Mechanical Engineering	Professional Ethics	BEME405T
12	Mechanical Engineering	Environment Science	BEME608P

**Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur**

**Subject: Indian Culture and Constitution (ICC) BSE 2-8 T**

Semester: II

Course: Audit (Non-credit), Total Marks: 50 (Internal)

Credit: Nil, Teaching Load: 2(Theory)/week

Course Objective:

1. To create an understanding of Indian Constitution and develop respect for the same.
2. To create awareness of India as a State Indian culture and Tradition.

Course Outcomes:

1. Students will become aware of Indian culture and civilization and their role in development of society.
2. Students will understand Industrial work-culture.
3. Students will be sensitized towards professional ethics.
4. Students will understand Indian Constitution and governance of the country.
5. Students will be able to understand the structure and system of work organizations.

*Abul*  
(Dr. Sajid Anwar)

*Abul*  
(AVB hands)

*Prin*

*RR*  
(R. R. Chidre)

**SYLLABUS:**

## Unit-I

1. Concept of Culture and Civilization
2. Vedic Civilization and Indus Valley Civilization
3. Introduction to Vedas, Ashram system, Varna System
4. Concept of Social Engineering (5 Hours)

## Unit-II

1. Meaning and Scope of Industrial Psychology and Industrial Sociology
2. Recruitment, Selection and Training of Workers,
3. Fatigue in industry.
4. Motives for work in industry (5 Hours)

## Unit-III

1. Sustainable Development
2. Social change .
3. Professional Ethics
4. Concept and styles of Leadership in Industry. (4 Hours)

## Unit-IV

1. Indian Constitution and Federal System
2. Fundamental Rights and Directive Principles of State Policy
3. Role of Bureaucracy in Modern Society
4. Socio-Legal Awareness: Right to Information(RIL), Public Interest Litigation(PIL) (5 Hours)

Abhishek

Abhishek

Girija  
Dr m. n. Girija

RR  
(R. R. Chide)

## Unit-V

1. Industrial Democracy
2. Works Organization: Formal and Informal Organization
3. Concept of Power, Authority and Status system;
4. Industrialization, Urbanization and Study of Slums in India . (5 Hours)

## Books Recommended:

- 1) A New Look into Social Sciences- Shabbir, Sheik and Dwadashiwar
- 2) An Introduction to Sociology- Vidya Bhushan and Sachdeva
- 3) Social Science: The Indian Scene-Yogesh Atal
- 4) Applied Humanities-Rajni Tandon
- 5) A History of World Civilizations-J.E.Swain
- 6) Industrial Psychology-Haire Mason
- 7) Introduction to Constitution of India- Durga Das Basu
- 8) Industrial Sociology in India-N.R.Seth
- 9) Human Resource Development and Management- Dr.A.M.Sheikh
- 10) The Economics of Sustainable Development-Surender Kumar

Note: As AICTE has recommended that students of Engineering should learn about Indian Constitution and Indian tradition, we propose above non-credit subject entitled 'Indian Culture and Constitution' to be included in second semester for all branches.

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(Ar. Bhargava)

Giriyas

Anm. n. Giriyas

BR

(B.R. Chide)

**RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR**  
**FACULTY OF SCIENCE & TECHNOLOGY**  
**B. TECH - CIVIL ENGINEERING**  
**(CHOICE BASED CREDIT SYSTEM)**

**BTCVE403T – ENVIRONMENTAL ENGINEERING**

**SYLLABUS**

Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
<b>UNIT NO.1</b>			
<b>Introduction:</b> Basics of water supply scheme, Water Demand, population forecasting methods, Sources of water & intake structures.	2		1
<b>Conveyance of water:</b> Types of pipes, joints, fittings, valves & appurtenances.	2		
<b>Water quality:</b> characteristics of water, Standards of drinking water. (WHO 2011, CPHEEO, IS 10500-2016).	2		
<b>Water Treatment:</b> Objective of water treatment, flow sheet of conventional water treatment plant.	1		
<b>Sedimentation:</b> Principles, types of setting basins, inlet and outlet arrangements, simple design of sedimentation tank.	2		
<b>UNIT NO.2</b>			
<b>Coagulation and Flocculation:</b> Definition, Principles, types of coagulants, coagulant doses, types of mixing and flocculation devices, Clariflocculators.	3		2
<b>Filtration:</b> Mechanism of filtration Types of filters-RSF, SSF, Pressure filters, sand specification, operational problems.Simple design of SSF and RSF, Membrane filtration technique of water treatment.	3		
<b>Disinfection:</b> Purpose, Mechanism, disinfectants, disinfection by chlorination. Type of chlorination.	2		
<b>Distribution systems:</b> Requirements & methods of distribution systems with layouts	1		



<b>UNIT NO.3</b>			
<b>General Introduction:</b> Study of waste water, black water & grey water. System of collection and conveyance of sewage- separate and combined systems, patterns of sewage collection systems. Quantity of storm water and sanitary waste water, Problems on quantity estimation.	3		3
<b>Sewer:</b> Types, Shapes, Hydraulic Design (Capacity, Size, Grade, etc.), Construction of sewer - Shoring, Trenching and laying to grade. Sewer materials, Sewer Appurtenances - manhole street inlets, storm water overflows, inverted syphons, flushing and ventilation: House plumbing systems, sanitary fitting and appliances, traps, anti-syphonage, inspection chambers and intercepting traps. Sewage pumping - location of pumping station. Sewer testing and maintenance.	3		
<b>Characteristics:</b> Physical and chemical characteristics of wastewater, significance of BOD, COD, BOD rate constant (Problems)	2		
<b>UNIT NO.4</b>			
<b>Preliminary &amp; Primary Treatments:</b> Sewage treatment flow sheet, site selection for sewage treatment plant. Preliminary and primary treatments - Screens, Grit chambers, oil & grease removal, Primary settling tank (Only working principles)	3		4
<b>Secondary treatments</b> - Principle of Biological Treatment, bacterial growth curve, Activated sludge process, trickling filter, sequence batch reactors, oxidation ponds (Only working principles)	2		
<b>Sewage Disposals:</b> Indian Standard for disposal, Methods of disposal, Sewage farming, self-purification of stream (Streeter Phelp's equation, Oxygen sag curve). Recycle & reuse of sewage (Zero discharge concept). Sludge digestion process, sludge drying beds.	2		
<b>Rural sanitation:</b> Pit privy, aqua privy, bio-gas recovery, Septic tank- soak pit (Only working principles). Sullage collection and disposal	2		
<b>UNIT NO.5</b>			
<b>Introduction</b> of air pollution and municipal solid waste, climate change, geo environment, environmental management system and sustainable resource management.	3		5

## References

Name of Book	Name of Author	Name of Publisher	Edition
Water Supply Engineering	B.C.Punmia, Ashok Jain and Arun Jain	Laxmi Publication	
Water Supply & Sewage	M.J.Macghee	McGraw Hill Publication	
Environmental Engineering Vol – I (Water Supply Engineering) and Environmental Engg Vol. II.	Dr P.N. Modi.	Standard Book House	
Environmemtal Engineering	Howards Peavy, Donald R. Rowe and George Tchobanoglous.	McGraw Hill Education	
Central Public Health Environmental Engg. Manual	--	( CPHEEO) New Delhi	
Wastewater Engineering: Treatment and Reuse	Metcalf & Eddy	McGraw Hill Education	
Environmental Engineering-Vol II	S.K.Garg	Standard Publication	
Waste Water Engineering	B.C.Punmia, Ashok Jain and Arun Jain	Laxmi Publication	
Water Supply & Sanitary Engineering	G.S.Birdie	DhanpatRai Publication	

*Shri*  
*Chetan G. Shinde*

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 ( Dr. Avinash N Shrikhande,  
 BOS (Civil Engg) chairman

*A. N. Dabhadre*  
 ( Dr. A.N. Dabhadre )  
 BOS member



**RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR**  
**FACULTY OF SCIENCE & TECHNOLOGY**  
**B. TECH CIVIL ENGINEERING (CHOICE BASED CREDIT SYSTEM)**

<b>Sem: V</b>	<b>Total Hours Distribution per week</b>		
<b>Total Credit: 03</b>	<b>Lecture (L): 3 Hrs</b>	<b>Tutorial/Activity (T/A): 0 Hrs.</b>	<b>Practical (P): 0 Hrs.</b>
<b>Subject Code</b>	<b>BTCVE504T</b>	<b>Name of Subject: Professional Practice, Law &amp; Ethics</b>	
<b>Examination Scheme</b>			
<b>Internal Marks:</b>		<b>University Marks:</b>	<b>Minimum Passing Marks:</b>
<b>30 Marks</b> <b>(15 Marks for sessional examination)</b> <b>(15 Marks for Activity based)</b>		<b>70 Marks</b>	<b>45 Marks</b>
			<b>Examination Duration:</b> <b>3 Hours</b>

**Course Objective**

1	The objective of this course is to inculcate the sense of social responsibility among learners and to make them realize the significance of ethics in professional environment so as to make them a global citizen
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**Course Outcome**

After completion of syllabus student able to

1	Understand basic purpose of profession, professional ethics and various moral and social issues.
2	Analyse various moral issues and theories of moral development
3	Realize their roles of applying ethical principles at various professional levels
4	Identify their responsibilities for safety and risk benefit analysis.
5	understand their constructive roles in dealing various global issues

## MAPPING OF CO WITH PO

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
BECVE504T 1						2	2	3				1
BECVE504T 2						2	2	3				1
BECVE504T 3						2	2	3				1
BECVE504T 4						2	2	3				1
BECVE504T 5						2	2	3				1

**1 Low**

**2 Medium**

**3 High**

## SYLLABUS

<b>Unit No.1</b>			
Details of Topic	Allotment of Hours		Mapped with CO Number
	L	T/A	CO
Human Values, Morals, values and Ethics, Integrity, Work ethics, Service learning, Civic virtue, Respect for others, Living peacefully, Caring, Sharing, Honesty, Courage	<b>08</b>		<b>1</b>
<b>Unit No.2</b>			
Engineering Ethics, Senses of 'Engineering Ethics', Variety of moral issues, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan's theory	<b>07</b>		<b>2</b>
<b>Unit No.3</b>			
Engineering as Social Experimentation, Engineering as Experimentation, Engineers as responsible Experimenters, Codes of Ethics, A Balanced Outlook on Law(Industrial Disputes Act, 1947; Industrial Employment ( Standing Orders) Act, 1946; Workmen's Compensation Act, 1923; Building & Other Construction Workers (regulation of employment and conditions of service) Act (1996) and Rules (1998); RERA Act 2017, NBC 2017)	<b>07</b>		<b>3</b>
<b>Unit No.4</b>			
Safety, Responsibilities and rights, Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and Reducing Risk, Collective Bargaining, Professional Rights, Employee Rights	<b>07</b>		<b>4</b>

Unit No.5			
Global issues, Multinational Corporations, Computer Ethics, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors, Corporate Social Responsibility	07		5

References							
Applicable for Unit No.	Name of Book	Name of Author	Name of Publisher	Edition	Category		
					Text Book	Research paper	Reference book
I,II,III, IV,V	Professional Ethics	R. Subramaniam	Oxford Publications, New Delhi.				Yes
	Human Values And Professional Ethics by,	Jayshree Suresh and B. S. Raghavan	S. Chand Publications				Yes
	Ethics in Engineering by-	Mike W. Martin and Roland Schinzinger	Tata McGraw-Hill - 2003.				Yes
	Human Values & Professional Ethics by,	S. B. Gogate	Vikas Publishing House Pvt. Ltd., Noida.				Yes
	Professional Ethics and Human Values	A. Alavudeen, R.Kalil Rahman, and M. Jayakumar	University Science Press.				Yes
	Engineering Ethics & Human Values	M.Govindarajan, S.Natarajan, and V.S.SenthilKumar	PHI Learning Pvt. Ltd - 2009.				Yes

*Shrihari*  
*Center for Science*

*A. N. Dabhade*  
 (Dr. A.N. Dabhade)  
 BOS Member

*Dr. Avinash N Shrikhande*  
 (Dr. Avinash N Shrikhande,  
 BOS (Civil Engg) chairman

**RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR**  
**FOUR YEAR BACHELOR OF ENGINEERING (B.E.) DEGREE COURSE**  
**SEMESTER: 3<sup>rd</sup> (C.B.C.S.)**

**BRANCH: COMPUTER SCIENCE & ENGINEERING**

Subject : *Universal Human Values*

Subject Code : **BECSE306T**

Load	Credits	College Assessment Marks	University Evaluation	Total Marks
02 Hrs (Theory)	02	15	35	50

**Aim:** To inculcate sensitivity among students towards themselves and their surrounding including family, society and nature.

**Prerequisite(s):** None

**Course Objectives:**

1	Development of a holistic perspective based on self-exploration, about themselves (human being), family, society and nature/existence.
2	Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence.
3	Strengthening of self-reflection.
4	Development of commitment and courage to act.

**Course Outcomes:**

At the end of this course Student are able to:

CO1	Become more aware of themselves, and their surroundings (family, society, nature)
CO2	Become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO3	They would have better critical ability.
CO4	Become sensitive to their commitment towards what they have understand (human values, human relationship and human society).

**Unit 1**

[06 Hrs]

Value education, definition, need for value education. The content and the process of value education, basic guidelines for value education, self-exploration as a means of value education, happiness and prosperity as part of value education.

**Unit 2**

[06 Hrs]

Harmony of self with body, coexistence of self and body, understanding the needs of self and the needs of body, understanding the activities in the self and the activities in the body.



**Unit 3****[06 Hrs]**

Values in relationship, the five dimensions of human endeavour, the holistic perception of harmony in existence.

**Unit 4****[06 Hrs]**

Basics for ethical human conduct, defects in ethical human conduct, human rights violations and social disparities, value based life.

**Text Books:**

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010

**Reference Books**

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. Indian Ethos and Modern Management: Amalgam of the best of the ideas from the East and the West, B.L. Bajpai, New Royal Book Bo., Lucknow, 2004
4. Human society in ethics and politics, Bertrand Russel, Routledge Publications, 2009



**RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR**  
**FOUR YEAR BACHELOR OF ENGINEERING (B.E.) DEGREE COURSE**  
**SEMESTER: 3<sup>rd</sup> (C.B.C.S.)**

**BRANCH: COMPUTER SCIENCE & ENGINEERING**

Subject : *Environmental Science*

Subject Code : **BECSE307T**

Load	Credits	College Assessment Marks	University Evaluation	Total Marks
02 Hrs (Theory)	NIL	NIL	NIL	NIL

**Course Outcomes:**

At the end of this course student are able to:

<b>CO1</b>	Identify different types of air pollutions as well as explain their causes, detrimental effects on environment and effective control measures.
<b>CO2</b>	Recognize various sources of water pollutants and interpret their causes and design its effective control measure
<b>CO3</b>	Illustrate various types of pollutants and waste management
<b>CO4</b>	Analyze various social issues related to environment and challenges in implementation of environmental laws.





**Unit I:****[06 Hrs]**

Contaminant behaviour in the environment, Air pollution due to SO<sub>x</sub>, NO<sub>x</sub>, photochemical smog, Indoor air pollution

Natural pathways for degradation: Carbon cycle, Sulphur cycle, Nitrogen cycle, Oxygen cycle.

Factors responsible for altering the composition of atmosphere (deforestation, burning of fossil fuels, industrial and vehicular emissions, CFCs).

Techniques to control Air pollution, ambient air quality and continuous air quality monitoring, Control measures at source, Kyoto Protocol, Carbon Credits.

**Unit II:****[06 Hrs]**

Major sources of water pollution: Eutrophication, acid mine drains, pesticides and fertilizers, dyeing and tanning, marine pollution, microplastics

Techniques to control water pollution: Conventional waste water treatment-types of sewage, sewerage system, alternative systems, primary, secondary and tertiary processes including aerobic and anaerobic techniques, safe disposal and its utility.

Treatment schemes for waste water from dairy, textile, power plants, pharmaceutical industries, and agro based industries such as rice mills

**Unit III:****[06 Hrs]**

Soil pollution: Soil around us, Soil water characteristics, soil pollution.

Causes, effects & control : noise pollution, nuclear & radiation hazards, marine pollution (Oil spills & Ocean Acidification)

Solid waste management: Composting, vermiculture, landfills, hazardous waste treatment, bioremediation technologies, conventional techniques (land farming, constructed wetlands), and phytoremediation.

Degradation of xenobiotics in environment: Petroleum hydrocarbons, pesticides, heavy metals

Introduction, types of e-wastes, environmental impact, e-waste recycling, e-waste management rules.

**Unit IV:****[06 Hrs]**

Concept of Sustainable development

Water conservation, rain water harvesting, watershed management

Resettlement and rehabilitation of people; its problems and concerns.

Environmental Laws (brief idea only)

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.

Different government initiatives (brief idea only)- National ambient air quality standard 2009, Swachh Bharat Abhiyan, National afforestation program and Act- 2016, National River conservation plan and National Ganga River basin authority, Formation of National Green Tribunal

**Activity**

1. Field Trip & Report Writing
2. Case-study & Report Writing

**Books suggested:**

1. Benny Joseph, Environmental Studies, Mc Graw Hill Education (India) Private Limited
2. B. K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut
3. P. Aarne Vesilind, J. Jeffrey Peirce and Ruth F. Weiner, Environmental Pollution and Control, Butterworth-Heinemann
4. D. D. Mishra, S. S. Dara, A Textbook of Environmental Chemistry and Pollution Control, S. Chand & Company Ltd.
5. Shree Nath Singh, Microbial Degradation of Xenobiotics, Springer-Verlag Berlin Heidelberg
6. Indian Environmental Law: Key Concepts and Principles edited by Shibani Ghosh, Publisher, Orient BlackSwan, 2019. ISBN, 9352875796.
7. P. Thangavel & Sridevi, Environmental Sustainability: Role of Green technologies, Springer publications



**RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR**  
**FOUR YEAR BACHELOR OF TECHNOLOGY (B.Tech.) DEGREE COURSE**  
**SEMESTER: V (C.B.C.S.)**  
**BRANCH: COMPUTER SCIENCE AND ENGINEERING**

Subject: **Audit Course: Yoga & Meditation**

Subject Code: **BTECH\_CSE-507T**

Load	Credits	College Assessment Marks	University Evaluation	Total Marks
2 Hrs/Week	-	50 (Grade)	-	Grade

**Aim:**

The purpose of this course is to learn the specific skills and/or the techniques of the activity. By actively participating in an activity class, the student may gain health benefits such as improved body composition, increased flexibility, increased muscular endurance and increased muscular strength. Participating in activity classes leads to a healthier lifestyle.

**Course Objectives:**

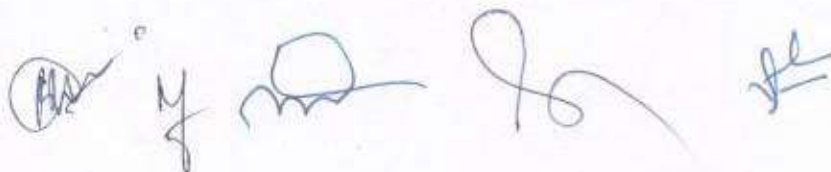
1. Learn the rules, fundamentals, skills & strategies of yoga.
2. Teach various asanas (postures) using hatha yoga & the Iyengar method.
3. Learn breathing techniques.
4. Improve strength, flexibility and the sense of well-being.
5. Increase relaxation of body and soul.

**Instructional Methodology:**

This class is an activity and participation course; the specific task/exercise(s) for students to complete will be demonstrated. Students will then complete the task/exercise(s) to the best of their ability.

**Curriculum:**

1. Two: Basic yoga asanas, breathing techniques and relaxation exercises.
2. Continuation of learning asanas, breathing techniques, and relaxation exercises.
3. Instructions for final yoga routine will be distributed to students.
4. Continuation of learning more advanced asanas, breathing techniques, relaxation exercises and meditation.



RashtrasantTukadoji Maharaj Nagpur University, Nagpur

Faculty of Engineering and Technology

B.E IVthsem (ETC/ECE/EN)

**Subject: Universal Human Values (Theory)**

CREDITS: 03

Teaching Scheme: 3 Hours/Week:

Examination Scheme: University Assessment: 70 Marks

College Assessment: 30 Marks

**Aim: To inculcate sensitivity among students towards themselves and their surrounding including family, society and nature**

**Objective:** The objective of the course is four fold:

1. Development of a holistic perspective based on self-exploration, about themselves(humanbeing), family,society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being,family,society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

**Course outcomes:** By the end of the course,

1. Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
2. Students would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
3. Students would understand values in relationship.
4. Students would understand the role of a human being in ensuring harmony in society and nature.
5. Students would distinguish between ethical and unethical practices at work place and would contribute for making a value based society

### **Unit 1**

Value education, definition, need for value education. The content and the process of value education, basic guidelines for value education, self-exploration as a means of value education, happiness and prosperity as part of value education.

(6 hours)

### **Unit 2**

Harmony of self with body, coexistence of self and body, understanding the needs of self and the needs of body, understanding the activities in the self and the activities in the body, Understanding Harmony of I with the body, Sanyam, Aspects of Sanyam, Types of Sanyam,



benefits and obstacles in the path of Sanyam, Swasthya, Aspects of Swasthya, Determinants of Swasthya, Ways to maintain Swasthya.

(8 hours)

### **Unit 3**

Values in relationship (nine universal values in relationships), Understanding values in human-human relationship; Meaning of Justice, Elements of Justice, Understanding meaning of Trust; Elements, Types and Dimensions of Trust, Difference between intention and competence.

(6 hours)

### **Unit 4**

The five dimensions of human endeavour, the holistic perception of harmony in existence, Understanding harmony in society: Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals.

(8 hours)

### **Unit 5**

Basics for ethical human conduct, definitiveness in ethical human conduct, human rights violations and social disparities, value based life, Competence in professional ethics

(8 hours)

**Text Book:** Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, ExcelBooks, New Delhi, 2010

### **Reference Books**

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. Indian Ethos and Modern Management: Amalgam of the best of the ideas from the East and the West, B.L. Bajpai, New Royal Book Bo., Lucknow, 2004
4. Human society in ethics and politics, Bertrand Russel, Routledge Publications, 2009

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur  
Faculty of Engineering and Technology

**B.E 3<sup>rd</sup> sem (IT)**

**Subject: Universal Human Values (Theory)**

CREDITS: 02

Teaching Scheme: 2 Hours/Week:

Examination Scheme: University Assessment: 35 Marks

College Assessment: 15 Marks

**Aim: To inculcate sensitivity among students towards themselves and their surrounding including family, society and nature**

**Objective:** The objective of the course is four fold:

1. Development of a holistic perspective based on self-exploration, about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

**Course outcomes:** By the end of the course,

1. Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
2. Students would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
3. They would have better critical ability.
4. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).

### **Unit 1**

Value education, definition, need for value education. The content and the process of value education, basic guidelines for value education, self-exploration as a means of value education, happiness and prosperity as part of value education. (6 hours)

### **Unit 2**

Harmony of self with body, coexistence of self and body, understanding the needs of self and the needs of body, understanding the activities in the self and the activities in the body. (6 hours)

### **Unit 3**

Values in relationship, the five dimensions of human endeavour, the holistic perception of harmony in existence. (6 hours)

### **Unit 4**

Basics for ethical human conduct, defects in ethical human conduct, human rights violations and social disparities, value based life. (6 hours)

**Text Book:** Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010



### Reference Books

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. Indian Ethos and Modern Management: Amalgam of the best of the ideas from the East and the West, B.L. Bajpai, New Royal Book Bo., Lucknow, 2004
4. Human society in ethics and politics, Bertrand Russel, Routledge Publications, 2009



**Rashtrasant Tukadoji Maharaj Nagpur University**  
**Syllabus for B.E. III Semester (IT)**

<b>Course Code</b>					
<b>Category</b>	<b>Mandatory Courses</b>				
<b>Course Title</b>	<b>Environmental Science</b>				
<b>Scheme &amp; credits</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Credits</b>	<b>Semester</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>III</b>

**Course Outcomes**

On successful completion of the course, the students:

1. Identify different types of air pollutions as well as explain their causes, detrimental effects on environment and effective control measures.
2. Recognize various sources of water pollutants and interpret their causes and design its effective control measure
3. Illustrate various types of pollutants and waste management.
4. Analyze various social issues related to environment and challenges in implementation of environmental laws.

**Syllabus**

**Unit-I Air pollution and its control techniques: (6 lectures)**

Contaminant behaviour in the environment, Air pollution due to SO<sub>x</sub>, NO<sub>x</sub>, photochemical smog, Indoor air pollution

Natural pathways for degradation: Carbon cycle, Sulphur cycle, Nitrogen cycle, Oxygen cycle.

Factors responsible for altering the composition of atmosphere (deforestation, burning of fossil fuels, industrial and vehicular emissions, CFCs).

Techniques to control Air pollution, ambient air quality and continuous air quality monitoring, Control measures at source, Kyoto Protocol, Carbon Credits.

**Unit-II Water pollution and its control techniques: (6 lectures)**

Major sources of water pollution: Eutrophication, acid mine drains, pesticides and fertilizers, dyeing and tanning, marine pollution, microplastics

Techniques to control water pollution: Conventional waste water treatment-types of sewage, sewerage system, alternative systems, primary, secondary and tertiary processes including aerobic and anaerobic techniques, safe disposal and its utility.

Treatment schemes for waste water from dairy, textile, power plants, pharmaceutical industries, and agro based industries such as rice mills

**Unit-III Other Environmental Pollution & Waste Management: (6 lectures)**

Soil pollution: Soil around us, Soil water characteristics, soil pollution.

Causes, effects & control : noise pollution, nuclear & radiation hazards, marine pollution (Oil spills & Ocean Acidification)

Solid waste management: Composting, vermiculture, landfills, hazardous waste treatment, bioremediation technologies, conventional techniques (land farming, constructed wetlands), and phytoremediation.

Degradation of xenobiotics in environment: Petroleum hydrocarbons, pesticides, heavy metals

Introduction, types of e-wastes, environmental impact, e-waste recycling, e-waste management rules.

**Unit-IV Social Issues and the Environmental Laws (6 lectures)**

Concept of Sustainable development

Water conservation, rain water harvesting, watershed management

Resettlement and rehabilitation of people; its problems and concerns.

Environmental Laws (brief idea only)

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.

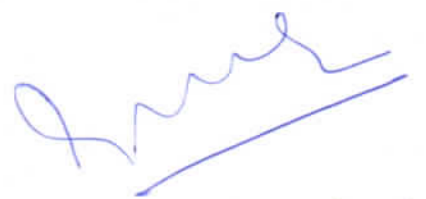
Different government initiatives (brief idea only)- National ambient air quality standard 2009, Swachh Bharat Abhiyan, National afforestation program and Act- 2016, National River conservation plan and National Ganga River basin authority, Formation of National Green Tribunal

#### Activity

1. Field Trip & Report Writing
2. Case-study & Report Writing

#### Books suggested:

- 1) Benny Joseph, Environmental Studies, Mc Graw Hill Education (India) Private Limited
- 2) B. K. Sharma, Environmental Chemistry, Goel Publishing House, Meerut
- 3) P. Aarne Vesilind, J. Jeffrey Peirce and Ruth F. Weiner, Environmental Pollution and Control, Butterworth-Heinemann
- 4) D. D. Mishra, S. S. Dara, A Textbook of Environmental Chemistry and Pollution Control, S. Chand & Company Ltd.
- 5) Shree Nath Singh, Microbial Degradation of Xenobiotics, Springer-Verlag Berlin Heidelberg
- 6) Indian Environmental Law: Key Concepts and Principles edited by Shibani Ghosh, Publisher, Orient BlackSwan, 2019. ISBN, 9352875796.
- 7) P. Thangavel & Sridevi, Environmental Sustainability: Role of Green technologies, Springer publications



Dr. S. V. Sonelkar  
Chairman,

**RTM Nagpur University**  
**Mechanical Engineering**  
**Professional Ethics Syllabus (Theory)**  
**BEME405T**

Semester	Course Title (Subject)	Hours / Week			Credits	Maximum Marks			Exam Duration (Hrs.)
		L	T	P		Continual Assessment	University Examination	Total	
		IV	Professional Ethics	3		-	-	3	

Sr. No.	Course Objective The objective of this course is–
1	The objective of this course is to inculcate the sense of social responsibility among learners and to make them realize the significance of ethics in professional environment so as to make them a global citizen
<b>Course Outcomes</b>	
After successful completion of this course the student will be able to:	
<b>CO1</b>	Understand basic purpose of profession, professional ethics and various moral and social issues
<b>CO2</b>	Analyze various moral issues and theories of moral development
<b>CO3</b>	Realize their roles of applying ethical principles at various professional levels
<b>CO4</b>	Identify their responsibilities for safety and risk benefit analysis.
<b>CO5</b>	Understand their roles in dealing various global issues

<b>Professional Ethics SYLLABUS (Theory )</b>	
Contents	No of hours
<b>Unit I</b> Human Values, Morals, values and Ethics, Integrity, Work ethics, Service learning, Civic virtue, Respect for others, Living peacefully, Caring, Sharing, Honesty, Courage	<b>08</b>
<b>Unit II</b> Engineering Ethics, Senses of 'Engineering Ethics', Variety of moral issues, Moral dilemmas, Moral Autonomy, Kohlberg's theory, Gilligan's theory	<b>07</b>
<b>Unit III</b> Engineering as Social Experimentation, Engineering as Experimentation, Engineers as responsible Experimenters, Codes of Ethics, A Balanced Outlook on Law	<b>07</b>
<b>Unit IV</b> Safety, Responsibilities and rights, Safety and Risk, Assessment of Safety and Risk, Risk Benefit Analysis and Reducing Risk, Collective Bargaining, Professional Rights, Employee Rights	<b>07</b>
<b>Unit V</b> Global issues, Multinational Corporations, Computer Ethics, Weapons Development, Engineers as Managers, Consulting Engineers, Engineers as Expert Witnesses and Advisors, Corporate Social Responsibility	<b>07</b>

**References:**

**Text Books Recommended:**

1. Professional Ethics by R. Subramaniam – Oxford Publications, New Delhi.
2. Human Values And Professional Ethics by Jayshree Suresh and B. S. Raghavan, S. Chand Publications
3. Ethics in Engineering by Mike W. Martin and Roland Schinzinger – Tata McGraw-Hill – 2003.
4. Human Values & Professional Ethics by S. B. Gogate, Vikas Publishing House Pvt. Ltd., Noida.
5. Professional Ethics and Human Values by A. Alavudeen, R.Kalil Rahman, and M. Jayakumaran – University Science Press.
6. Engineering Ethics & Human Values by M.Govindarajan, S.Natarajan, and V.S.SenthilKumar-PHI Learning Pvt. Ltd – 2009.
7. Professional Ethics and Human Values by Prof.D.R.Kiran-Tata McGraw-Hill – 2013

**RTM Nagpur University- Mechanical Engineering**  
**6<sup>th</sup> Semester (Mandatory Course)**  
**Environmental Studies –(BEME608T)**  
**Syllabus (Theory)**

Semester	Course Title (Subject)	Hours / Week			Audit	GRADES			Exam Duration (Hrs.)
		L	T	P		Continual Assessment	University Examination	Total	
<b>B.Tech 6<sup>th</sup> Sem Mechanical</b>	<b>Environmental Studies</b>	00	-	02	00	Grades O,A,B,C	Grades O,A,B,C	--	--

Sr. No.	Course Objective The objective of this course is–
1	This course provides an integrated and interdisciplinary approach to the study of environment and solutions to environmental problems. This course will spread awareness among the students about environmental issues and shall alert them to find solutions for sustainable development.

**GUIDELINES FOR EVALUATION OF ENVIRONMENTAL STUDIES SUBJECT**  
**(As per Ordinance No. 2 of 2012)**

In view of the above entire course the students in terms of batches of 20 students each may be assigned a project work encompassing People's Bio-diversity Register (PBR) of any Gram Panchayat as per the format of Bio-diversity Authority of India under the guidance of a teacher. The PBR should be evaluated for 100 marks.

The result shall be declared in grades as follows:

Grade O: above 75 Marks; Grade A: 61–75 Marks; Grade B: 51-60 Marks; Grade C: 40-50 Marks



<b>Syllabus Environmental Studies, 6<sup>th</sup> Semester, Mechanical Engineering</b>	
Contents	No of hours
<b>Unit I :</b> Definition, scope and importance; Need for public awareness -Institutions in environment,people in environment.	04
<b>Unit II:</b> Renewable and non-renewable and associated problems; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles.	04
<b>Unit III:</b> Concept of an ecosystem - understanding ecosystems, ecosystem degradation, resource utilization, Structure and functions of an ecosystem- producers, consumers) and decomposers. Energy flow in the ecosystem - water, carbon, oxygen, nitrogen; and energy cycles, integration of cycles in nature.  Ecological succession; Food chains, food webs and ecological pyramids; Ecosystem types - characteristic features, structure:, and functions of forest, grassland, desert and aquatic	04
<b>Unit IV:</b> Introduction - biodiversity; at genetic, species and ecosystem levels Bio-geographic classification of India  Value of biodiversity - Consumptive use value, productive use .value, social, ethical, moral,aesthetic and optional value of biodiversity .India as a mega-diversity nation; hotspots of biodiversity  Threats to bio-diversity - habitat loss, poaching of wildlife, man-wild life conflicts. Common endangered and endemic plant and animal species of India. Insitu and Exsitu conservation of biodiversity	04
<b>Unit V</b> Definition; Causes, effects and control measures of air, water, soil, marine, noise and thermal pollutions and nuclear hazards.  Solid waste management - Causes, effects and control measures of urban and industrial waste. Role of individual and institutions in prevention of pollution.  Disaster management Floods, Earth quacks, Cyclone and land slides	04

**References:**

**Text Books Recommended:**

1. A Text Book of Environmental Studies for Undergraduate Courses, Erach Bharucha, University Press (India) Pvt. Ltd., Hyderabadintelligence”, McGraw-Hill Book Co., 1987.