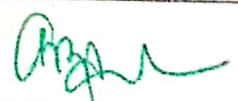


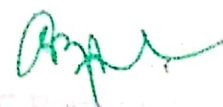
7.1.15. THE INSTITUTION OFFERS A COURSE ON HUMAN VALUES AND PROFESSIONAL ETHICS RESPONSE: YES – OFFERED AS A COURSE

Department	Year	Course Code	Course Name
MECH	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
ECE	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
EEE	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
CSC	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	III SEM/GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	III SEM/GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
	2018-2019	II SEM/ GE8291	Environmental Science & Engineering.

  
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		VIII SEM /GE8076	Professional Ethics in Engineering.
PCE	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
	2015-2016	III SEM/ GE6351	Environmental Science & Engineering.
	2016-2017	III SEM/ GE6351	Environmental Science & Engineering.
	2017-2018	III SEM/ GE6351	Environmental Science & Engineering.
	2018-2019	VII SEM/ GE8291	Environmental Science & Engineering.
		VI SEM / GE8076	Professional Ethics in Engineering.
PE	2014-2015	V SEM/ GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	V SEM/ GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	V SEM/ GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Engineering Ethics And Human Values.
	2017-2018	V SEM/ GE6351	Environmental Science & Engineering.
		VIII SEM /GE6075	Professional Ethics in Engineering.
FT	2018-2019	VII SEM/ GE8291	Environmental Science & Engineering.
		VI SEM / GE8076	Professional Ethics in Engineering.
	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
AUTO	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2018-2019	III SEM/ GE8291	Environmental Science & Engineering.
		V SEM / GE8076	Professional Ethics in Engineering.
	2014-2015	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2015-2016	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2016-2017	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.
	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		V SEM /GE6075	Professional Ethics in Engineering.



Dr. C. Ravi Kumar

Head of Institution

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CIVIL		VI SEM /GE6075	Professional Ethics in Engineering.
	2017-2018	III SEM/GE6351	Environmental Science & Engineering.
		VI SEM /GE6075	Professional Ethics in Engineering.
	2018-2019	II SEM/ GE8291	Environmental Science & Engineering.
		V SEM / GE8076	Professional Ethics in Engineering.

GE6075

PROFESSIONAL ETHICS IN ENGINEERING

L T P C 3 0 0 3

#### OBJECTIVES:

To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

#### UNIT I HUMAN VALUES 10

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

#### UNIT II ENGINEERING ETHICS 9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories

#### UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION 9

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

#### UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS 9

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk - Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights –Intellectual Property Rights (IPR) – Discrimination

#### UNIT V GLOBAL ISSUES 8

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility TOTAL: 45 PERIODS

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OUTCOMES: Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society .TEXTBOOKS:


1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003. 2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001
5. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd., New Delhi 2013.
6. World Community Service Centre, "Value Education", Vethathiri publications, Erode, 2011

Web sources:

1. [www.onlineethics.org](http://www.onlineethics.org)
2. [www.nspe.org](http://www.nspe.org)
3. [www.globalethics.org](http://www.globalethics.org)
4. [www.ethics.org](http://www.ethics.org)

  
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**OBJECTIVE:** To enable the students to create an awareness on Engineering Ethics and Human Values to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

#### UNIT I HUMAN VALUES 10

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

#### UNIT II ENGINEERING ETHICS 9

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles – Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories.

#### UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION 9

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

#### UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS 9

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination.

#### UNIT V GLOBAL ISSUES 8

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Code of Conduct – Corporate Social Responsibility.

**TOTAL: 45 PERIODS**

**OUTCOME:** Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

#### TEXT BOOKS:

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.
2. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.



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REFERENCES:

1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009.
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.
4. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
5. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd., New Delhi, 2013.
6. World Community Service Centre, 'Value Education', Vethathiri publications, Erode, 2011.



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GE6351 ENVIRONMENTAL SCIENCE AND ENGINEERING

L T P C 3 0 0 3



## OBJECTIVES:

- To study the nature and facts about environment.
- To finding and implementing scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value
- To study the dynamic processes and understand the features of the earth's interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

## UNIT I ENVIRONMENT, ECOSYSTEMS AND DIVERSITY 12

Definition, scope and importance of Risk and hazards; Chemical hazards, Physical hazards, Biological hazards in the environment – concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers-Oxygen cycle and Nitrogen cycle – energy flow in the ecosystem – ecological succession processes – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds Field study of simple ecosystems – pond, river, hill slopes, etc.

## UNIT II ENVIRONMENTAL POLLUTION 10

Definition – causes, effects and control measures of: (a) Air pollution (Atmospheric chemistry- Chemical composition of the atmosphere: Chemical and photochemical reactions in the atmosphere - formation of smog, PAN, acid rain, oxygen and ozone chemistry;- Mitigation procedures- Control of particulate and gaseous emission, Control of SO<sub>2</sub>, NO<sub>x</sub>, CO and HC) (b) Water pollution : Physical and chemical properties of terrestrial and marine water and their environmental significance; Water quality parameters – physical, chemical and biological; absorption of heavy metals - Water treatment processes. (c) Soil pollution - soil waste management: causes, effects and control measures of municipal solid wastes – (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards–role of an individual in prevention of pollution – pollution case studies – Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

## UNIT III NATURAL RESOURCES 10



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Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and overutilization of surface and ground water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Energy Conversion processes – Biogas – production and uses, anaerobic digestion; case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Introduction to Environmental Biochemistry: Proteins –Biochemical degradation of pollutants, Bioconversion of pollutants. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

#### UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – 12 Principles of green chemistry- nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – environment production act – Air act – Water act – Wildlife protection act – Forest conservation act – The Biomedical Waste (Management and Handling) Rules; 1998 and amendments- scheme of labeling of environmentally friendly products (Eco mark). Enforcement machinery involved in environmental legislation- central and state pollution control boards- disaster management: floods, earthquake, cyclone and landslides. Public awareness.

#### UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

Population growth, variation among nations – population explosion – family welfare program – environment and human health – human rights – value education – HIV / AIDS – women and child welfare –Environmental impact analysis (EIA)- -GIS-remote sensing-role of information technology in environment and human health – Case studies.

TOTAL: 45 PERIODS

#### OUTCOMES:

Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.

Public awareness of environmental is at infant stage.

Ignorance and incomplete knowledge has led to misconceptions

Development and improvement in std. of living has led to serious environmental disasters



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Department of Environmental Science  
VIT-AP



TEXT BOOKS:

1. Gilbert M.Masters, "Introduction to Environmental Engineering and Science", 2nd edition, Pearson Education, 2004.

2. Benny Joseph, "Environmental Science and Engineering", Tata McGraw-Hill, New Delhi, 2006. REFERENCES :

1. Trivedi.R.K., "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards", Vol. I and II, Enviro Media, 3rd edition, BPB publications, 2010.

2. Cunningham, W.P. Cooper. T.H. Gorhani, "Environmental Encyclopedia", Jaico Pubk, House, Mumbai, 2001.

3. Dharmendra S. Sengar, "Environmental law", Prentice hall of India PVT LTD, New Delhi, 2007.

4. Rajagopalan, R, "Environmental Studies-From Crisis to Cure", Oxford University Press, 2005.



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**OBJECTIVES:**

To study the nature and facts about environment.

To finding and implementing scientific, technological, economic and political solutions to environmental problems.

To study the interrelationship between living organism and environment.

To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.

To study the dynamic processes and understand the features of the earth's interior and surface.

To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

**UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14**

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds; Field study of simple ecosystems – pond, river, hill slopes, etc.

**UNIT II ENVIRONMENTAL POLLUTION 8**

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

**UNIT III NATURAL RESOURCES 10**

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-



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UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

OUTCOMES:

☐ Environmental Pollution or problems cannot be solved by mere laws. Public participation is an Important aspect which serves the environmental Protection. One will obtain knowledge on the Following after completing the course.

- ☐ Public awareness of environmental is at infant stage.
  - ☐ Ignorance and incomplete knowledge has led to misconceptions
  - ☐ Development and improvement in std. of living has led to serious environmental disasters
- TEXTBOOKS:**

TEXTBOOKS:

1. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2006.
2. Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.

## REFERENCES:

1. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT LTD, New Delhi, 2007.
2. Erach Bharucha, "Textbook of Environmental Studies", Universities Press (I) PVT, LTD, Hyderabad, 2015.
3. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.

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