



**1.3.1 Institution integrates cross cutting issues relevant to Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum**

The institution integrates cross-cutting issues relevant to Gender, Environment and Sustainability, Human Values and Professional Ethics into the curriculum offered for various programmes. The following are the sample syllabus of some of the courses offered on the above mentioned issues:

- ❖ Sociology, Ethics & Human Values
- ❖ Environmental Studies
- ❖ Family Law – I
- ❖ Air Pollution And Control
- ❖ Engineering Ethics

  
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**B.S. Abdur Rahman Crescent Institute**  
of Science & Technology  
Vandalur, Chennai - 600 048, India

**OBJECTIVES:**

- To describe the fundamental and basic concepts of Sociology.
- To illustrate how society evolved in India with changes in social strata.
- To explain the importance of groups, teams in industrial spheres.
- To develop the knowledge of social impact of economic liberalization and technology.
- To state some basic concepts on ethics, values and human rights.
- To develop social responsibility & human professional ethics.
- To recognize and determine the role of engineers in the economic and social development of the society.

**MODULE I FUNDAMENTALS OF SOCIOLOGY**

8

Sociology - definition, evolution, scope- Basic concepts- Social Process- Sociological theories, Social Institutions – family, economic, politics, religion, education, culture, Social Stratification , Socialization & Social Control.

**MODULE II SOCIOLOGY IN INDIAN CONTEXT**

7

Development in India– Caste & Classes – Women and Society – impact of social laws, Social Change in contemporary India – Secularism and Communalism – Social Exclusion and Inclusion.

**MODULE III INDUSTRIAL SOCIOLOGY**

7

Definition and perspectives – Industry in India – Social groups in industry – Behavior pattern, Group Dynamics – team, enhancing group behaviour. Industrial Organization - formal and informal organizations, Line and staff organizations - functions.

**MODULE IV INDUSTRIAL – SOCIETY INTERFACE**

8

Perspectives – Social responsibilities – Sociological effect on industrialization – urbanization, child labour, psychological impact, Impact of technology, Modernization – Globalization – challenges, Role of engineers.

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**MODULE V ETHICS AND HUMAN VALUES**

7

**Ethics and values** – Organizational values – personal worth, ethical behavior, Professional ethics-professional rights and responsibilities, Whistle blowing, International ethics, Corruption.

**MODULE VI ENGINEERS AND SOCIETY**

8

**Quality of life and society** – engineer in economic development, Technology development – invention, innovation and diffusion, Appropriate Technology– Engineer's contribution, Ecology and environment –Sustainable development– Role of engineers.

**Total Hours: 45**

**REFERENCES:**

1. Samir Das Gupta and Paulomi Saha, An Introduction to Sociology, Pearson, Delhi, 2012.
2. Narender Singh, Industrial Sociology, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012.
3. Vidya Bhushan and D.R. Sachdeva, Fundamentals of Sociology, Pearson, Delhi, 2012.
4. Deshpande, Satish, Contemporary India : A Sociological view, Viking (2002)
5. Thopar, Romila, Early India, Penguin (2003).
6. Mike Martin and Roland Schinzinger, Ethics in Engineering, McGraw Hill, New York, 1996.
7. Haralambos, Heald R.M, Sociology Themes and Perspectives, Oxford, New Delhi-92
8. Ram Ahuja, Social Problems in India, Rawat Publications ,New Delhi

**OUTCOMES:**

On successful completion of this course,

- Students will have exposure to the fundamentals and the basic concepts of Sociology.
- Students will have gained knowledge about the reality of the society.

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**GEC 1212****ENVIRONMENTAL STUDIES****L T P C****2 0 0 2****OBJECTIVES:**

The student will be conversant with the

- various natural resources, availability, utilisation and its current scenario
- different ecosystems, energy transfer, values, threats and conservation of biodiversity
- levels of different pollutants and its impact and the causes and effects of natural disasters
- impacts of human population, impact assessment, human rights and environmental acts and sustainable development

**MODULE I****NATURAL RESOURCES****8**

Land resources: land degradation, soil erosion and desertification - Forest resources: use and over-exploitation, deforestation - Water resources: use and over-utilisation of surface and ground water, conflicts over water (inter-state and international), dams (benefits and problems), water conservation (rainwater harvesting and watershed management) - Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, mining - Food resources: world food problems, changes in land use by agriculture and overgrazing, modern agriculture and its effects, fertilizer and pesticide problems, water logging and salinity - Energy resources: increasing energy needs, renewable and non-renewable, use of alternate energy sources.

**MODULE II****ECOSYSTEM AND BIODIVERSITY****8**

**Ecosystem**- energy flow in the ecosystem - food chains, food webs and ecological pyramids - characteristics, structure and function of (a) **Terrestrial ecosystems** (forest, grassland, desert) and (b) **Aquatic fresh water ecosystems** (pond, lake, river) (c) Aquatic salt water ecosystems (ocean, estuary) - ecological succession.

**Biodiversity** - genetic, species and ecosystem diversity – hot-spots of biodiversity – biogeographic classification of India - endangered, endemic, extinct and invasive species of India - red data book - values of biodiversity: consumptive, productive, social, ethical, aesthetic and option values - threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts - conservation of biodiversity: in-situ and ex-situ conservation of biodiversity

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**MODULE III ENVIRONMENTAL POLLUTION AND NATURAL DISASTER 8**

Definition, cause, 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 - ill-effects of fireworks and upkeep of clean environment - solid waste management: types (urban, industrial, biomedical and electronic wastes), collection, processing and disposal (incineration, composting and land-fill) - natural disaster and management: flood, cyclone, drought, landslide, avalanche, volcanic eruptions, earthquake and tsunami.

**MODULE IV HUMAN POPULATION, HEALTH AND SOCIAL ISSUES 6**

Population and population growth, population variation among nations, population explosion, family welfare programme.

Human health: air-borne, water borne diseases, infectious diseases, risks due to chemicals in food and environment.

Sustainable development - environmental legislation and laws: water act, air act, wildlife protection act, forest conservation act, environment protection act - environmental impact assessment, steps in EIA - human rights - women and child welfare.

**Case studies related to current situation**

**TOTAL HOURS – 30**

**TEXT BOOKS:**

1. Erach Bharucha, Textbook for Environmental Studies For Undergraduate Courses of all Branches of Higher Education for University Grants Commission, Orient Blackswan Pvt Ltd, Hyderabad, India, 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill Education, India, 2009.
3. Ravikrishnan A, Environmental Science and Engineering, Sri Krishna Publications, Tamil Nadu, India, 2015.
4. Raman Sivakumar, Introduction to Environmental Science and Engineering, McGraw Hill Education, India, 2009.
5. Venugopala Rao P, Principles of Environmental Science and Engineering, Prentice Hall India Learning Private Limited; India, 2006.
6. Anubha Kaushik and Kaushik C.P., Environmental Science and Engineering,

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New Age International Pvt Ltd., New Delhi, India, 2009.

**REFERENCES:**

1. Masters G.M., Introduction to Environmental Engineering and Science, Prentice Hall, New Delhi, 1997.
2. Henry J.G. and Heike G.W., Environmental Science and Engineering, Prentice Hall International Inc., New Jersey, 1996.
3. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co. Boston, USA, 2016.

**OUTCOMES:**

The student will be able to

- predict the scenario of various natural resources and suggest remedies to curb the exploitation of these resources.
- identify food chain and web and its role in various ecosystems, assess the impacts on biodiversity and provide solutions to conserve it.
- analyse the impacts of pollutants in the environment and propose suitable method to alleviate the pollutants and the natural disasters.
- assess on the impact of human population and the health related issues and the ethics to be followed for sustainable life.

  
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**BLC2102****FAMILY LAW I**

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**OBJECTIVES:**

To understand the Family as an Institution and various personal laws that govern issues relating to marriage, divorce, adoption and maintenance, minority and guardianship are the subject matter of this course. Student will go through Acts that govern and the decision of higher judiciary on various matter

**MODULE I****INTRODUCTION TO PERSONAL LAW****12**

Application of various personal laws- Traditional and modern sources of Hindu Law and Muslim Law – The Classical Schools of Hindu Law and Muslim Law – Origin of the Schools – Main Schools and sub-Schools – Effect of Migration

**MODULE II****LAW ON MARRIAGE****12**

Nature of Marriage – Various forms of marriage and requirements for a valid marriage on a comparative analysis – Void, voidable and valid marriage in different religious texts and statutes – Laws and Issues on marriage under the Special Marriage Act – Unisex marriage and question on living together – The demand of dowry and the concept of dower under the relevant personal laws – ceremonies of marriage under various religious systems.

**MODULE III****LAW ON DIVORCE & MAINTENANCE****12**

Restitution of Conjugal Rights, Judicial Separation, Nullity of Marriage and

Divorce – Various grounds and procedure on a comparative analysis – Court's jurisdiction and procedure for the issues raised on marriage and divorce – In Camera proceedings – Decree on proceedings – Maintenance under Hindu, Muslim and Christian Laws – Permanent alimony – Maintenance during pendency of the suit - Maintenance under the Special Marriage Act, the Hindu Adoptions and Maintenance Act and the Code of Criminal Procedure. Structure, procedure and jurisdiction of Family Courts – The Family Courts Act

**MODULE IV****LAW ON LEGITIMACY OF CHILDREN AND ADOPTION****12**

Legitimacy of children born of void and voidable marriages – Their rights and legal issues – Adoption in different religious groups – Requisites, conditions, procedure of

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adoption – Effect of adoption – Inter-Country adoption

**MODULE V                      LAW ON MINORITY AND GUARDIANSHIP**

**12**

Guardian under the Hindu Minority and Guardianship Act, 1956 – Definition- types of guardians – Guardianship under Muslim Law – Procedure for appointment and their powers – Guardian under the Guardian and Wards Act 1890

**Total Hours –60**

**TEXT BOOKS:**

Books

Mulla - Hindu Law

N.R. Raghavachari - Hindu Law

Dr. Paras Diwan - Family Law

Mulla - Principles of Mahomedan Law

Fyzee - Outlines of Mahomedan Law

Kusum - Family Law Lectures – Family Law I

Mayne - Hindu Law & Usage

Mitra - Hindu Law

**REFERENCES:**

Acts:

The Hindu Marriage Act, 1955

The Hindu Adoptions and Maintenance Act, 1956

The Hindu Minority and Guardianship Act, 1956

The Special Marriage Act, 1954

The Guardian and Wards Act, 1890

The Dissolution of Muslim Marriage Act, 1939

The Christian Marriage Act 1872

Indian Divorce Act, 1869

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Indian Majority Act, 1875

The Muslim Women (Protection Of Rights On Divorce) Act, 1986

The Family Courts Act, 1984

The Dowry Prohibition Act, 1961

The Hindu Widows' Remarriage Act 1856

Prohibition of Child Marriage Act, 2006

### OUTCOMES:

Student will get clarity on family as an institution and legal issues arise out of family relations. He can understand changing facets of family as a social unit and legal issues that surface.

  
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**CECX11****AIR POLLUTION AND CONTROL**

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**OBJECTIVES:**

- To impart knowledge about: The sources of air pollution and their effects on living and non-living environment.
- Analysis of various sampling methods and analysis of air pollutants
- Simulation techniques of transport and transformation of the air pollutants with the help of dispersion models.
- Use the various devices or equipments and the other techniques available for control of air pollutants.
- Categorization of air pollution control methods through legislation and regulation acts.
- To describe the sources, characteristics, effects and control of noise pollution.

**MODULE I SOURCES AND EFFECTS OF AIR POLLUTANTS 8**

Classification of air pollutants – Particulates and gaseous pollutants – Sources of air pollution – Source inventory – Effects of air pollution on human beings, materials, vegetation, animals – global warming-ozone layer depletion.

**MODULE II SAMPLING & ANALYSIS 7**

Sampling and Analysis – Basic Principles of Sampling – Source and ambient sampling – Analysis of pollutants – Principles

**MODULE III DISPERSION OF POLLUTANTS 8**

Elements of atmosphere – Meteorological factors – Wind roses – Lapse rate – Atmospheric stability and turbulence – Plume rise – Dispersion of pollutants – Dispersion models – Applications.

**MODULE IV AIR POLLUTION CONTROL 8**

Concepts of air pollution control – Principles and design of control measures – Particulates control by gravitational, centrifugal, filtration, scrubbing, electrostatic precipitation – Selection criteria for equipment – gaseous pollutant control by adsorption, absorption, condensation, combustion – Pollution control for specific major industries

**MODULE V AIR QUALITY MANAGEMENT 7**

Air quality standards – Air quality monitoring – Preventive measures – Air pollution

control efforts – Zoning – Town planning regulation of new industries – Legislation and enforcement – Environmental Impact Assessment and Air quality.

## MODULE VI NOISE POLLUTION

7

Sources of noise pollution – Effects – Assessment - Standards – Control methods – Prevention.

**Total Hours : 45**

### TEXT BOOKS:

1. Anjaneyulu, D., "Air Pollution and Control Technologies", Allied Publishers, Mumbai, 2002
2. Rao, C.S., "Environmental Pollution Control Engineering", Wiley Eastern Ltd., New Delhi, 2003
3. Rao, M.N., and Rao, H.V.N., "Air Pollution Control", Tata-McGraw-Hill, New Delhi, 1996

### REFERENCES:

1. Mahajan, S.P., "Pollution Control in Process Industries", Tata McGraw-Hill Publishing Company, New Delhi, 1991
2. Peavy, S.W., Rowe, D.R. and Tchobanoglous, G., "Environmental Engineering", McGraw Hill, New Delhi, 1985

### OUTCOMES:

At the end of the course, students will be able to

- Classify the sources of air pollution and list its effects on living and non-living environment.
- Sample and analyse the various air pollutants
- Demonstrate the procedure for simulation of transport of air pollutants with the help of dispersion models.
- Identify and describe features of devices or equipments available for control of air pollutants
- Suggest air pollution control methods through legislation and regulations
- Describe sources, characteristics, effects and control of noise pollution

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**CECX37****ENGINEERING ETHICS**

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**OBJECTIVES:**

- To enable the students to identify the core values that shapes the ethical behavior of an engineer.
- To enable the students to utilize opportunities to explore one's own values in ethical issues.
- To make the students aware of ethical concerns and conflicts.

To enhance familiarity with codes of conduct and increase the ability to recognize and resolve ethical dilemmas.

**MODULE I ENGINEERING ETHICS 8**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories.

**MODULE II ENGINEERING AS SOCIAL EXPERIMENTATION 8**

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study.

**MODULE III ENGINEER'S RESPONSIBILITY FOR SAFETY 8**

Safety and Risk – Assessment of Safety and Risk – Risk Analysis – Reducing Risk – The Government Regulator's Approach to Risk - Case Studies Chernobyl and Bhopal disasters.

**MODULE IV ETHICAL RESPONSIBILITIES 7**

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime

**MODULE V ETHICAL RIGHTS 6**

Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

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**MODULE VI GLOBAL ISSUES 8**

Multinational Corporations – Business Ethics - Environmental Ethics—ethics of

technology– Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct.

**Total Hours : 45**

**TEXT BOOKS:**

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 2005.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics Concepts and Cases", Thompson Learning, Belmont, CA, 2000.
3. Charles D. Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, 1999.

**REFERENCES:**

- 1 John R. Boatright, "Ethics and the Conduct of Business", Pearson Education, 2003.
- 2 Edmund G. Seebauer and Robert L. Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, New York, 2001.
- 3 Bajaj, P.S., and Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, 2004.
- 4 David Ermann and Michele S. Shauf, "Computers, Ethics and Society", Oxford University Press, New York, 2003.

**OUTCOMES:**

At the end of the course, the students will be:

- able to identify the core values that shape the ethical behavior of an engineer.
- aware of the ethical concerns and Standards.
- able to handle ethical dilemmas in a better way.
- able to maintain loyalty confidentiality, responsibility and avoiding the areas where conflicts of interests arise.
- able to demonstrate the knowledge of ethical laws and intellectual rights.
- able to describe the ethical implications of emerging technologies

  
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