K.S. SCHOOL OF ENGINEERING AND MANAGEMENT,

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

Sl. No.	Description of crosscutting issue	Title of course wherein the issue is addressed	Unit/chapter no.	Remarks
1	Professional Ethics	18CV71 Quality Surveying and Contract Management	Module 5	Contract Management-Post award: Basic understanding on definitions, Performance security, Mobilization and equipment advances, Secured Advance, Suspension of work, Time limit for completion, Liquidated damages and bonus, measurement and payment, additions and alterations or variations and deviations, breach of contract, Escalation, settlement of account or final payment, claims, Delay's and Compensation, Disputes & its resolution mechanism, Contract management and administration.
2	Professional Ethics	18CV51 Construction Management And Entrepreneurship	Module 2	Basic concepts of resource management, class of lab our, Wages & statutory requirement, Labour Production rate or Productivity, Factors affecting labour output or productivity.
3	Professional Ethics	18CV51 Construction Management And Entrepreneurship	Module 5	Entrepreneurship: Evolution of the concept, functions of an entrepreneur, concepts of entrepreneurship, stages in entrepreneurial process, different sources of finance for entrepreneur, central and state level financial institutions.

4	Professional Ethics	21CIP37/47 Constitution of India and Professional Ethics (CIP)	Module 5	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.
5	Professional Ethics	22MBA21 Human Resource Management	Module -3	Performance Management and Appraisal: Objectives of Performance Management, Performance Management and Performance Appraisal, Common Problems with Performance Appraisals, Performance Management Process, Types of Performance Rating Systems, Future of Performance Management.
6	Professional Ethics	22MBA21 Human Resource Management	Module -4	Human Resource Management in Small and Medium Enterprises: Introduction to SMEs, The Difference in Adoption of Human Resource Management, SMEs and Large Firms, Indian Experience, Impact of Weak Adoption of Human Resource Management in SMEs,

7	Professional Ethics	21CIP37/47 Constitution of India and Professional Ethics (CIP)	Module 5	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.
8	Human Values	21CIP37/47 Constitution of India and Professional Ethics (CIP)	Module 1	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.
9	Human Values	21CIP37/47 Constitution of India and Professional Ethics (CIP)	Module 2	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.

10	Human Values	21UHV49 Universal Human Values	Module 1	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
11	Human Values	21UHV49 Universal Human Values	Module 2	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.
12	Human Values	21UHV49 Universal Human Values	Module 3	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

13	Human Values	21UHV49 Universal Human Values	Module 4	Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature, Realizing Existence as Coexistence at All Levels, The Holistic Perception of Harmony in Existence
14	Human Values	21UHV49 Universal Human Values	Module 5	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
15	Human Values	22MBA11 Management and Organizational Behaviour	Module 3	Organisational Behaviour: Introduction, Meaning, History of Organisational Behaviour, Organisational effectiveness, Organisational learning process, Stakeholders, Contemporary challenges for Organisations.
16	Human Values	22MBAHR405 Personal Growth and Interpersonal Effectiveness	Module -2	Interpersonal Trust: Openness, confidentiality, blind spot and unknown part of personality. Self-disclosure, seeking feedback, self-reflection and practicing new behaviors. Discovering facets of interpersonal trust through Johari Window.

17	Human Values	22MBAHR405 Personal Growth and Interpersonal Effectiveness	Module -4	Attitudes, Beliefs, Values and their impact on Behaviour: Personal change meaning, nature and requisites. Social adjustments and habit formation. Locus of control. Habits of personal effectiveness. Seven habits of highly effective people.
18	Human Values	22MBAHR405 Personal Growth and Interpersonal Effectiveness	Module -6	Transactional Analysis: Ego states, types of transactions and time structuring. Life position, scripts and games; T-group sensitivity training, encounter groups, appreciative enquiry and group relations conference (students may go through three days personal growth lab for experiential learning) .

19	Environment	18CV732 Air Pollution and Control	Module1	Definition, Sources, classification and characterization of air pollutants. Effects of air pollution on health, vegetation & materials. Types of inversion, photochemical smog.
20	Environment	18CV732 Air Pollution and Control	Module 2	Meteorology: 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.
21	Environment	18CV732 Air Pollution and Control	Module 3	Sampling: Sampling of particulate and gaseous pollutants (Stack, Ambient & indoor air pollution), Monitoring and analysis of air pollutants (PM2.5, PM10, SOX, NOX, CO, NH3). Development of air quality models-Gaussian dispersion model including Numerical problems.
22	Environment	18CV732 Air Pollution and Control	Module 4	Control Techniques: Particulate matter and gaseous pollutants- settling chambers, cyclone separators, scrubbers, filters & ESP - Including Numerical problems. Site selection for industrial plant location.

23	Environment	18CV732 Air Pollution and Control	Module 5	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
24	Environment	18CIV59 Environmental Studies	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.
25	Environment	18CIV59 Environmental Studies	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.
26	Environment	18CIV59 Environmental Studies	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.

27	Environment	18CIV59 Environmental Studies	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.
28	Environment	18CIV59 Environmental Studies	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.
29	Environment	18ME751 Energy and Environment	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

30	Environment	18ME751 Energy and Environment	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
31	Environment	18ME751 Energy and Environment	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
32	Environment	18ME751 Energy and Environment	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.

33	Environment	18ME751 Energy and Environment	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.
34	Sustainability	18CV643 Alternate Building Materials	Module 1	Introduction: Energy in building materials, Environmental issues concerned to building materials, Embodied energy and life-cycle energy, Global warming and construction industry, Green concepts in buildings, Green building ratings – IGBC and LEED manuals – mandatory requirements, Rainwater harvesting & solar passive architecture. Environmental friendly and cost effective building technologies, Requirements for buildings of different climatic regions.
35	Sustainability	18CV643 Alternate Building Materials	Module 2	Elements of Structural Masonry: Elements of Structural Masonry, Masonry materials, requirements of masonry units' characteristics of bricks, stones, clay blocks, concrete blocks, stone boulders, laterite Blocks, Fal- G blocks and Stabilized mud block. Manufacture of stabilized blocks. Structural Masonry Mortars: Mortars, cementations materials, sand, natural & manufactured, types of mortars, classification of mortars as per BIS, characteristics and requirements of mortar, selection of mortar. Uses of masonry.

36	Sustainability	18CV643 Alternate Building Materials	Module 3	Alternate Building Materials: Lime, Pozzolana cements, Raw materials, Manufacturing process, Properties and uses. Fibers- metal and synthetic, Properties and applications. Fiber reinforced plastics, Matrix materials, Fibers organic and synthetic, Properties and applications. Building materials from agro and industrial wastes ,Types of agro wastes, Types of industrial and mine wastes, Properties and applications. Masonry blocks using industrial wastes. Construction and demolition wastes.
37	Sustainability	18CV643 Alternate Building Materials	Module 4	Alternate Building Technologies: Use of arches in foundation, alternatives for wall constructions, composite masonry, confined masonry, cavity walls, rammed earth, Ferro cement and ferroconcrete building components, Materials and specifications, Properties, Construction methods, Applications. Top down construction, Mivan Construction Technique. Alternate Roofing Systems: Concepts, Filler slabs, Composite beam panel roofs, Masonry vaults and domes.

38	Sustainability	18CV643 Alternate Building Materials	Module 5	Equipment for Production of Alternate Materials: Machines for manufacture of concrete, Equipments for production of stabilized blocks, Moulds and methods of production of precast elements, Cost concepts in buildings, Cost saving techniques in planning, design and construction, Cost analysis: Case studies using alternatives.
39	Sustainability	18EE731 Solar and Wind Energy	Module 1	Fundamentals of Energy Science and Technology: Introduction, Energy, Economy and Social Development, Classification of Energy Sources, Importance of Non -conventional Energy Sources, Salient features of Non-conventional Energy Sources,
40	Sustainability	18ME742 Emerging Sustainable Building Cooling Technologies	Module 1	Social and Environmental Issues related to conventional Refrigeration and Air conditioning: Climate Change and energy poverty implications of energy consumption and refrigerants use by conventional VaporCompression based RAC technologies, Global and Indian environmental, energy efficiency and green building policies, laws and rules warranting a trajectory shift in the RAC economy, Introduction to Thermal comfort as an ‘ends’ and cooling systems as a ‘means’, Socio-economic and environmental benefits of a Negawatt approach to energy conservation vs. a Megawatt approach towards power generation.

41	Sustainability	18ME742 Emerging Sustainable Building Cooling Technologies	Module 2	Thermal Comfort, Climate Analysis and Psychrometry: The 'human thermal comfort' lens and its implications for cooling system design, Progressive models for addressing human thermal comfort needs, Thermodynamics of human body, Factors affecting human comfort, Introduction to the ASHRAE Std. 55, Adaptive Comfort Model and the Indian Model for Adaptive Comfort (IMAC) and its implications for mitigating climate change and energy consumption from cooling.
42	Sustainability	18ME742 Emerging Sustainable Building Cooling Technologies	Module 3	Refrigeration Systems and Refrigerants: Thermodynamics of Vapor Compression Refrigeration (VCR) and Vapor Absorption Machine (VAM) Cycles, Equipment used in commercial and residential VCR and VAM systems, Physical, Chemical, Thermodynamic and Environmental properties of Refrigerants and Refrigerant mixtures (zeotropic and azeotropic mixtures) used in conventional VCR system, Absorbent – Refrigerant combinations (Water-Ammonia and LithiumBromide) used in VAM systems, Physical, Chemical, Thermodynamic and Environmental properties of emerging Natural Refrigerants for VCR systems

43	Sustainability	18ME742 Emerging Sustainable Building Cooling Technologies	Module 4	Air conditioning: Air conditioning demand scenarios for India and associated health, social justice, energy access, and environmental Implications for its peoples and communities, Potential sustainable air conditioning scenarios for India, Heat transfer and psychrometric principles of air conditioning cycles, Engineering principles of air conditioning components, Air conditioning coefficient-of-performance calculation, Energy efficient air conditioning system, Energy and greenhouse gas emissions-based performance comparison of natura
44	Sustainability	18ME742 Emerging Sustainable Building Cooling Technologies	Module 5	Sustainable Cooling Technologies: Radical social justice fostering, energy conservation, and climate change mitigation potential of natural cooling, Design principles of natural and sustainable cooling systems, Science and engineering design principles of a) Direct, Indirect, and Hybrid (Direct-Indirect and DX) Evaporative Cooling technology, b) Structure Cooling, c) Radiant Cooling Systems, and d) Solar VAM technology, Basic equipment sizing calculations, System performance assessment methods, Comparative energy consumption, greenhouse gas emissions and life-cycle cost case studies for residential and commercial applications of conventional and sustainable cooling technologies.