

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF CENTRE: Centre of Excellence in Disaster Mitigation and Management

Subject Code: DMS-501

Course Title: Climate Change and Sustainable Development

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outlines: Climate Change and its impacts; Concepts of adaptation and mitigation; Sustainability and its various dimensions (economic, social and environmental); Principles of sustainable development; Sustainable development goals; Sustainable development sectors: Food-Energy-Water (FEW) nexus, material, city; Sustainable development policies.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-501

Course Title: Economic and Business Environment

L-T-P: 2-0-0

Credits: 02

Subject Area: SSC

Course Outlines: The Central Concepts of Economics, How Economy Works-Micro and Macroeconomic concepts, Business Cycles and Policy Responses-Fiscal and Monetary Policies, Growth and Development- Technological Change and Innovation, Global Economy-Trade, Tariffs, and Balance of Payment.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-502

Course Title: Sociology of Work

L-T-P: 2-0-0

Credits: 02

Subject Area: SSC

Course Outlines: Context for development of Sociology of work, Theories in Sociology of work, Human relations approach, Fordism and post-fordism, Types of productive systems, Industrialisation and post-industrial society, Recent trends in work and industry, Informal sector, Future of work, Precarity, IT industry in India, Social exclusion in Indian MNCs.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-503

Course Title: Learning and Memory

L-T-P: 2-0-0

Credits: 02

Subject Area: SSC

Course Outlines: Early Philosophical Approaches, Cognitive Psychology, Common Research Methods in Cognition and Learning, Neurological Basis of Learning, Neurotransmission, Behavioural Learning, Operant Conditioning, Strengthening Behavior, Biological Constraints, Avoidance Conditioning, Social Learning, Observational Learning, Imitation, Theories in Learning, Affect and Motivation in Learning, Emotion during Learning, Classical and Modern Motivational Theories, Cognitive Learning, Short-term Memory, Working Memory, Conscious Learning, Forming Memories, Retrieving Memories, Semantic Memory, Forgetting, Retrieval Errors.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Name of Department/Centre: Department of Humanities and Social Sciences

Subject Code: HSS-504

Course Title: Advanced Technical Communication Skills

L-T-P: 1-0-2

Credits: 02

Subject Area: SSC

Course Outlines: Introduction to Advanced Technical Communication Skills, Aspects of Effective Communication, Dimensions of technical communication, Non-verbal communication, Barriers to Communication, Forms of Writing in Technical Communication, Structure and Steps in Writing/Drafting Projects/Technical Reports Using Different Style Sheets, Technical Descriptions, Letters, Memos, Minutes of the Meeting, MoUs, Email Etiquette, Writing CV/Resume, Group Discussion Technique, Oral Presentation, Stage Fright, Interview Skills, Meeting Decorum, Negotiation and Persuasion, Communication and AI: Chatbot, Social media in teaching.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**NAME OF DEPARTMENT/CENTER/SCHOOL:** Centre for Indian Knowledge Systems**Subject Code:** IKS-501 **Course Title:** Introduction to Indian Knowledge Systems**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outline: Introduction and foundational concepts of IKS: various streams of knowledge in India and classification of ancient Indian texts, Psychology from Indian perspective, Yoga and Indian Linguistics: Introduction to Yoga; theory of emotions, Pāṇini's contribution to linguistics, Indian Mathematics and Astronomy: An overview of Indian mathematics, Development of arithmetic geometry and Trigonometry, Vedic Mathematics and Indian Astronomy, Medicinal traditions in India, An Introduction to Āyurveda, Indian Architecture and Planning, Traditional measurement system used in Vāstuśāstra and Economics, Management and Governance from Indian perspectives.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTER/SCHOOL: Centre for Indian Knowledge Systems

Subject Code: IKS-502

Course Title: The Philosophy of Yoga

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outline: An Introduction to the Six Schools of Indian Philosophy (Shad Darshanas), The Yoga Sutra of Patanjali, The Samādhi Pāda, Sādhana Pāda, Vibhuti Pada, Kaivalya Pada.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**NAME OF DEPARTMENT:** Department of Hydro and Renewable Energy**Subject Code:** HRS-501**Course Title:** Environmental and Social Sustainability**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outlines: History, and evolution of sustainability concepts, The role of environmental ethics and social justice in sustainability, Pillars of sustainability, Interconnections between environment and society, understanding ecosystems and human-environment interactions, social determinants of environmental sustainability; Principles of Sustainable Development, Sustainable development goals and indicators, Triple bottom line approach: balancing environmental, social, and economic considerations, Green economy and circular economy models, Green Economy Transition (GET), Sustainable Resource Management, Renewable energy and energy efficiency, Water management and conservation strategies, Social Equity and Inclusive Development, Gender equality and empowerment, Indigenous rights and traditional knowledge, Role of government regulations and incentives, Challenges and Opportunities for Sustainability, Climate change and adaptation strategies, Policy and governance for sustainability Environmental and Social Framework Assessment and Management of Environmental and Social Risks

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**NAME OF DEPARTMENT/CENTER/SCHOOL:** Centre for Indian Knowledge Systems**Subject Code:** IKS-501 **Course Title:** Introduction to Indian Knowledge Systems**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outline: Introduction and foundational concepts of IKS: various streams of knowledge in India and classification of ancient Indian texts, Psychology from Indian perspective, Yoga and Indian Linguistics: Introduction to Yoga; theory of emotions, Pāṇini's contribution to linguistics, Indian Mathematics and Astronomy: An overview of Indian mathematics, Development of arithmetic geometry and Trigonometry, Vedic Mathematics and Indian Astronomy, Medicinal traditions in India, An Introduction to Āyurveda, Indian Architecture and Planning, Traditional measurement system used in Vāstuśāstra and Economics, Management and Governance from Indian perspectives.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTER/SCHOOL: Centre for Indian Knowledge Systems

Subject Code: IKS-502

Course Title: The Philosophy of Yoga

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outline: An Introduction to the Six Schools of Indian Philosophy (Shad Darshanas), The Yoga Sutra of Patanjali, The Samādhi Pāda, Sādhana Pāda, Vibhuti Pada, Kaivalya Pada.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE

NAME OF DEPARTMENT: Department of Hydro and Renewable Energy

Subject Code: HRS-502

Course Title: Energy Economics

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outline:

Overview of World energy scenario, primary energy demand, and supply. Energy and development linkage, energy prices. Fundamentals of economics, decision-making process, investment appraisal methods. Economic and financial analysis of renewable energy projects, government incentives and disincentives, project financing for energy projects, case studies. Environmental externalities, business and the environment, environmental protection as an opportunity for sustainability.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**NAME OF DEPARTMENT:** Department of Hydrology**Subject Code:** HYS-501**Course Title:** Natural Resources, Society and Environment**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outlines: Introduction to Earth's resources and their environmental interactions. Energy resources, petroleum and renewables, mineral extraction processes, and associated pollution. Soil and water resources, composition, pollutants, global usage, and degradation. Testing soil and water quality parameters, sustainable resource use and environmental awareness through case studies and group projects.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE

NAME OF DEPARTMENT: Department of Hydrology

Subject Code: HYS-502

Course Title: Rural Water Supply and Sanitation

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outlines: This course provides a comprehensive overview of village and rural settings, focusing on water management, including water needs assessment and the implementation of community water supply systems. It introduces diverse strategies to prevent water source contamination, utilizing both traditional and modern cost-efficient treatment approaches. Additionally, the course covers effective management of solid and liquid waste through proper collection, segregation, and disposal techniques, alongside innovative solutions for low-cost sanitation, such as household and community toilet systems. Emphasis is placed on public health priorities, including sustainable hygiene practices and interventions, within the socio-economic context. Furthermore, the course addresses empowerment initiatives, professional soft skills development, and incorporates case studies and practical projects for a holistic learning experience.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**NAME OF CENTRE:** Centre for Sustainable Energy**Subject Code:** SES-501 **Course Title:** Sustainable Energy: Challenges and Industrial Perspective**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outlines: Importance of energy, conventional energy sources, renewable/green energy, sources of renewable energy, energy future; Sustainability theory and practice, including population, global change, ecosystem degradation and resource limitations; Present status of renewable energy; Global warming and the forecast for humans' impact on earth's climate; Key challenges and pathways to sustainable development; Industry outlook.

INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE

NAME OF CENTRE: Centre for Sustainable Energy

Subject Code: SES-502

Course Title: Sustainability Transition and Policy

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outlines: Sustainability goals; Societal Transitions; Technological, organizational, economic and institutional innovations; Economy wide and sectoral changes in energy, transport, waste and water management; Net Zero Systems; Decarbonization Strategies; Transition Policies and Sustainable Practices.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**NAME OF DEPARTMENT:** Department of Polymer and Process Engineering**Subject Code:** PES-501**Course Title:** Polymers for Society and Sustainability**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outlines: Polymer-integral to Sustainable Development, Bio-degradable polymer, Sustainability issues in polymer and society; Environmental footprint of polymer production; Issues of polymer waste and pollution; Innovations in green chemistry, Health risks associated with polymer chemicals, Medical plastics waste management, Polymers in sustainable water treatment and separations, Economic benefits and costs of polymers, Social implications and public perception, Polymers and resource conservation land, water, forest and energy, Integrated polymer waste management.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE: International Centre of Excellence for Dams

Subject Code: DSS-502

Course Title: Stakeholder Management of Dams and Large
Infrastructure Projects

L-T-P: 1-1-0

Credits: 2

Subject Area: SSC

Course Outlines: Relevance of stakeholder management in dam projects; Variety, variability & complexity of issues; Project impediments: social, environmental, legal, and associated issues of financing, contracts, resource management; Identification and classification; Networked effect; Stakeholder model for dam projects; Two-way process of stakeholder relationship; Level of relationship, Measurement of stakeholder value; Social & environmental safeguards; Stakeholder oriented organizations.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**NAME OF DEPARTMENT/CENTRE:** Department of Water Resources Development and Management**Subject Code:** WRS-501**Course Title:** Water and Society**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outlines: Water and sustainable development, water development and management practices in the past communities, socio-economic and cultural dimensions of water, water demand for drinking, food, industry, energy, and recreation, water supply challenges in rural and urban areas, water resources in changing climate, extreme weather events and disaster management, water conservation practices and efficient water use, water quality and health, water and urbanization, transboundary/inter-state water sharing challenges, community water management.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**NAME OF DEPARTMENT/CENTRE/SCHOOL:** Department of Management Studies**Subject Code:** BMS-501**Course Title:** Human Resource Management**L-T-P:** 2-0-0**Credits:** 2**Subject Area:** SSC

Course Outlines: HRM, Job Analysis, Job Description, Job Specification, Role Analysis, HR Planning; Markov Analysis. Recruitment; Interview Techniques; Training & Development; Performance and Potential Appraisal; Compensation Management Planning, Wages & Salary Administration, Wage Policy, HRA-Introduction, Personal Records and Reports. Introduction to IR-Health and Safety, Employee Welfare, Employee Grievances and Discipline, Collective Bargaining. Participation and Empowerment, Trade unions and employers' associations, Industrial Relations and Industrial Disputes, Career and Succession Planning; Current business trends and its impact on HR: Emerging HR issues and contemporary HR concepts and practices.

INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPARTMENT/CENTRE/SCHOOL: Department of Management Studies

Subject Code: BMS-502

Course Title: Essentials of Marketing Management

L-T-P: 2-0-0

Credits: 2

Subject Area: SSC

Course Outlines:

Defining marketing in the modern dynamics, Developing marketing strategies and plans, Creating customer value, Understanding consumer and business markets, Interpreting the difference between products and services, Understanding segmentation and targeting, crafting the brand positioning, Key elements in the marketing mix: product, price, place, and promotion, Decoding challenges in the modern marketing dynamics, Creating successful long-term growth via marketing.