DEPARTMENT OF CIVIL ENGINEERING

NPTEL EQUIVALENT COURSES FOR Minor Degree – 2024 - 25

NPTEL EQUIVALENT COURSES

S NO	Course Id	Course Name	Course syllabus
1	noc24-ce03	Air pollution and Control	COURSE PLAN : Week 1 : Air Pollution: Introduction and Impacts of air pollution on human health, vegetation, animals, building materials, structures, and atmosphere, soil and water bodies. Week 2 : Sources, classification and formation/transformation of air pollutants: Meteorology and Atmospheric Stability. Week 3 : Lapse Rate, Plume Behaviour, and Air Quality Monitoring, Air Quality Index (AQI) Week 4 : Air Quality Modelling, Gaussian dispersion models: point, line and area source models Week 5 : Emissions Inventory: Transport, Industrial, Agricultural, Residential and Commercial sectors Week 6 : Application of Remote sensing/Satellite based data in emission inventory, Source apportionment using

			receptor modelling. Week 7 : Indoor air pollution: sources, types and health impacts. Sampling, assessment and evaluation of Indoor air quality. Week 8 : Global and regional environmental issues of air pollution: Ozone depletion, Climate change, Global warming, Acid rain. Week 9 : Air pollution control devices, equipment and their design. Week 10 : Air pollution emission standards, National and international policies, acts, rules and regulations. Week 11 : Emerging technologies and strategies to mitigate air pollution, Current challenges and way forward. Week 12 : Lab-based measurements of air pollutants.modelling
2	noc24-ce11	Environmental Remediation of Contaminated Sites	COURSE PLAN : Week 1: Introduction Week 2: Laws, Regulations and Remediation A.Legal Concepts 1.Types of Law 2.Regulations a)Federal B.Laws/Regulations a)History b)Objectives c)Remediation Process d)Definition of hazardous waste e)Waste Classification f)Corrective Action Week 3: Risk Assessment A.Introduction 1.Terminology 2.History B .Steps in Human Health Risk Assessment 1.Data Collection and Evaluation 2.Exposure Assessment 3.Toxicity Assessment 4.Risk Characterization 5.Risk Management 6.Risk Communication

			C.Ecological Risk Assessment D.Risk-based Corrective Action Week 4: Remedial Options:Introduction Week 5: Administrative Options Week 6: Groundwater
3	noc24-ce14	Geographic Information Systems	COURSE PLAN : Week 1: What is Geographic Information Systems?, Essential components of GIS, Different types of vector data, Concept of topology, Demonstration through GIS software Week 2: Raster data model and comparisons with vector, TIN data model and comparisons with raster, Non-spatial data (attributes) and their types, Vector Data Compression Techniques, Demonstration through GIS software Week 3: Raster Data Compression Techniques-01, Raster Data Compression Techniques-02, Georeferencing, Pre- processing of spatial datasets-01, Demonstration through GIS software Week 4: Pre-processing of spatial datasets-02, Pre-processing of spatial datasets-03, Spatial Interpolation Techniques-01, Spatial Interpolation Techniques-02, GIS Analysis- 01 Week 5: GIS Analysis-02, GIS Analysis-03, GIS Analysis- 04, GIS Analysis-05, Demonstration through GIS software Week 6: GIS Analysis-06, GIS Analysis-07, Attributes Classification Methods, Spatial Database systems and their types-01, Demonstration through GIS software Week 7: Spatial Database systems and their types-02, Concept of NoData in Raster, Different map projections, Concept of digital elevation model (DEM) and how it is represented, Demonstration through GIS software Week 8: Various techniques to generate digital elevation models-1, Various techniques to generate digital elevation models-2, Various techniques to generate digital elevation models-3, Digital Elevation Models and different types of resolutions, Demonstration through GIS software

			Week 9: How to assess quality of a DEM, Integration of DEMs with satellite data, Common derivatives of DEMs - Slope and aspect-01, Common derivatives of DEMs - Slope and aspect-02, Demonstration through GIS software Week 10: Common derivatives of DEMs - Slope and aspect-03, DEMs derivatives-1, DEMs derivatives-2, DEMs derivatives-3, DEMs derivatives-4 Week 11: Triangulated Irregular Network (TIN) and its derivatives, Shaded relief models and their applications, DEM based Surface Hydrologic Modelling-1, DEM based Surface Hydrologic Modelling-2, DEMs and Dam Simulation and its application in groundwater hydrology Week 12: DEMs Sources, limitations and future of Digital Elevation Models, Applications of DEMs in Viewshed and Flood Hazard Mapping, Applications of DEMs in solar and wind energy potential estimations, Errors in GIS and key elements of maps, Limitations and Rules of GIS
4	noc24-ce25	Plastic Waste Management	COURSE PLAN : Week 1: Plastics – What it is? Types, Uses and Global Statistics Week 2: Plastic Waste – Sources, Production, Global and Indian Context Week 3: Plastic Waste Management Rules 2016 (India) and Global Rules and Regulations Week 4: Plastic Bans including China Sword Policy implication on global plastic waste management Week 5: Impact of Plastics on Marine Life, Effect on Wildlife, Human Health and Environment Week 6: Plastic Waste Management Practices – Use of Plastic waste in roads, issues and challenges Week 7: Possible Alternate Materials to Plastics –Greener Alternatives Week 8: Plastics Resource Recovery and Circular Economy
5	noc24-ce41	निर्माण प्रबंधन (Construction Management) के सिद्धांत[Nirman prabandhan (Construction Management) ke Siddhant]	COURSE PLAN : Week 1: General overview and project organization Week 2: Estimation of project cost Week 3: Construction Economics Week 4: Planning and scheduling: part-1

			Week 5: Planning and scheduling: part-2 Week 6: Quality management Week 7: Safety Management Week 8: Legal aspects of a construction project
6	noc24-ce47	Energy Efficiency, Acoustics and Daylighting in Building	Course layout Week 1 : Environmental Factors: Factors and their representation, tropical environments and site environments, etc. Week 2 : Human response to environment: Factors affecting human comfort, Human response to thermal environment, noise, visual environment etc.; Comfort indices Week 3 : Response of building to thermal environment: Processes of heat exchange of building with environment; Effect of solar radiation; Thermal properties of material and sections and their influence Week 4 : Steady and periodic heat transfer in buildings Week 5 : Heat flow computations: Transmission matrix, Admittance method, etc.-1 Week 6 : Heat flow computations: Transmission matrix, Admittance method, etc.-2 Week 7 : Structural control and design for energy efficiency: Selection of envelope elements, Orientations, shape, Glasses and shading devices Week 8 : Natural ventilation: Purpose of ventilation, Mechanisms, Fenestration Design for natural ventilation Week 9 : Noise and Building: Basic acoustics and noise, Planning, Sound in free field, protection against external noise Week 10 : Internal noise sources and protection against air borne & structure borne noise. Week 11 : Day lighting: Lighting principles and fundamentals Week 12 : Sky, Indian sky, daylight prediction and design of fenestration.

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