Description of Thesis
CVLE 799-PhD THESIS (22Crs.):
Since the PhD is the highest earned degree conferred by Faculty of Engineering, The thesis should demonstrate superior quality both in scientific, creativity and presentation capabilities. It must be rationally related; research oriented, and should reflect scholarly and literary merit, beyond the master’s degree, which is indicative of the candidate's ability to conduct original research in engineering.

Description of Courses
Public Works Engineering

CVLE 701-TRANSPORT MODELING (3Crs.):
Methods of demand forecasting (trends and extrapolation, category analysis, econometric models, land use models, gravity models), Travel demand models, Trip generation models, trip distribution models, Mode choice models, Trip assignment models. Application of models (Intercity, urban, international, regional). Calibration of demand models (multiple regression, error analysis).

CVLE 702-TUNNEL ENGINEERING (3Crs.):

CVLE 703-ADVANCED RAILWAY CONTROL SYSTEMS (3Crs.):
Types of technology applied for control systems, Centralized traffic control centers, Computerized electronic interlocking, Communication systems for railway, Automatic railway control systems, Subway control systems, Problems of railway control systems, Examples of railway control systems, Magnetic trains.

CVLE 704-UNDERGROUND RAIL TRANSPORT SYSTEMS (3Crs.):
Characteristics of subway transit system, Slab track design, Operation and control systems, Performance characteristics, Rolling stock, Track construction, Track facilities, Operating and Capital costs.
CVLE 705- OPTIMIZATION AND SIMULATION OF RAILWAY SYSTEMS (3Crs.):  
Optimization of railway networks, Methods of optimization. Simulation of Railway operations.  
Objectives of simulations, Model and systems of simulations (Model building for economical and technical systems). Statistical evaluation, Application of simulation technique in railway, Movement performance simulation, Track simulation.

CVLE 706-RAILWAY PLANNING FOR HIGH SPEED SYSTEMS (3Crs.):  
Track types, slab track, Ballasted track, Curve planning (Planning elements, Theoretical and practical values of super elevation, Transitions Curves, Ramps, Gradients, Vertical alignment), Track junction specifications, Control systems.

CVLE 707-TRAFFIC THEORY (3Crs.):  
Traffic stream parameters volume and rates of flow, Travel time studies field techniques, Statistical analysis, Delay studies.

CVLE 708-INTELLIGENT TRAFFIC SYSTEMS ITS (3Crs.):  
The Range of ITS applications, Actuated Signal control and detection, Network optimization, Sensing traffic using virtual detectors, In-vehicle routing and personal route information, Smart car, Commercial routing and delivery, Electronic toll collection, Smart card, Congestion pricing, Dynamic assignment, Traffic enforcement, Bus transit and Para-transit, Emerging issues, use of GPS.

CVLE 709-TRANSPORTATION LOGISTICS (3Crs.):  
Introduction, International trade, Transport Chains, Classification of carriers and modal characteristics, Multi-modal Transport Concept, Warehousing and material handling (Loading and unloading facilities, costs, designs, vehicle design, storage), Distribution strategies (Networks, collection-distribution systems), Marketing of transport services (Concepts and approach in transport sector; Location theory).

CVLE 710-EVALUATION OF TRANSPORT PROJECTS (3Crs.):  
Economic evaluation techniques (annual return, rate of return, benefit cost analysis), Environment impact assessment (environment impact statements, transportation environmental impacts), Transportation evaluation techniques, Process of project appraisal (Appraisal path, methodology, procedures and documentation, multi-disciplinary analysis), Risk analysis, Sensitivity analysis.

CVLE 711-AIR TRANSPORT PLANNING (3Crs.):  
Components of air transport (airport activity, types of airport, aircraft characteristics), Airport planning (organization and finance, development of study design, demand and technology forecasts, determination of facility requirements), Airspace traffic control (Airways, navigation aids, air traffic control facilities, air traffic control operations, air traffic control development trends), Design of air side area (runway configuration, runway Geometry, runway Length, runway capacity analysis, taxiway layout, holding aprons, markings, lighting, pavement design, drainage), Design and operation of land side area (air terminal building, vehicular circulation and parking, terminal ground access).
Structural and Geotechnical Engineering

CVLE 712-PRESTRESSED CONCRETE STRUCTURES (3Crs.):  

CVLE 713-NONLINEAR ANALYSIS OF STRUCTURES (3Crs.):  

CVLE 714-ANALYSIS OF COMPOSITE DESIGN (3Crs.):  

CVLE 715-ANALYSIS OF SPACE AND NON CONVENTIONAL STRUCTURES (3Crs.):  

CVLE 716-ADVANCED SOIL MECHANICS (3Crs.):  

CVLE 717-NUMERICAL MODELING OF CONCRETE STRUCTURES (3Crs.):  

CVLE 718-DYNAMICS AND SEISMIC ANALYSIS OF STRUCTURES (3Crs.):  

CVLE 719-BEHAVIOR AND STABILITY OF METAL STRUCTURES (3Crs.): Introduction: Failure and Yield criteria. Bending Members: Symmetrical and Unsymmetrical Bending.

CVLE 720-ADVANCED FINITE ELEMENT METHOD (3Crs.):

CVLE 721-MATHEMATICAL PROGRAMMING (a) (3Crs.):

CVLE 722-MATHEMATICAL PROGRAMMING (b) (3Crs.):

CVLE 723-VIBRATION CONTROL (3Crs.):
Passive energy dissipaters; metallic yield dampers; viscoelastic dampers; viscous fluid dampers; Tuned mass dampers; tuned liquid dampen; Active control; optimal mix of active and passive control; adaptive control; intelligent control; Hybrid control; hybrid mass dampers; hybrid base isolation; semi active control systems; variable orifice dampers; controllable fluid dampers; semi active impact dampers; sensors for structural control; Civil engineering applications; smart material systems; code development. Prerequisites: Structural dynamics I or Introduction to Structural Dynamic.

CVLE 724-CONDITIONS OF CONTRACTS FOR WORKS OF CIVIL ENG. CONSTR. (FIDIC) (3Crs.):
Water Resources and Environmental Engineering

CVLE 725-WATER LOGGING AND DRAINAGE SYSTEMS (3Crs.):

CVLE 726-ENVIRONMENTAL IMPACT ASSESSMENT OF IRRIGATION AND DRAINAGE PROJECTS (3Crs.):
Environmental Impact assessment of irrigation and drainage projects. The need for environmental assessment, the context of environmental analysis, the process of EIA. Major impacts of irrigation and drainage projects. Preparation of terms of references.

CVLE 727-WAVE HYDRAULICS AND COASTAL ENGINEERING (3Crs.):
Linear wave theory, wave properties, shallow water transformations, higher order theories, wave spectra and wave generation, Littoral currents, Sea currents, Breaker and surf, Breakwaters, Surf zone dynamics, Coastal sediment transport, Shore protection measures.

CVLE 728-WATER PURIFICATION ENGINEERING (3Crs.):
Water resources, Portability of water, Drinking water standards, Ground water, advanced technology of water treatment, Sedimentation processes, Water filtration, and Water disinfection.

CVLE 729-WASTEWATER REUSE AND WASTE RECYCLE (3Crs.):
Collection methods, Simplified and economic treatment methods, Reuse of wastewater, Land treatment, Wastewater reuse applications, Standards, Origin of wastes, Process industry wastes, Food processing industries, Material industries, Chemical industries, Metals recycling, Waste paper recycling.

CVLE 730-INDUSTRIAL WASTEWATER TREATMENT (3Crs.):
Water and wastewater characteristics, Rates and quality of water supply and wastewater for different industries, Treatment methods, Origin of wastes, Process industry wastes, Food processing industries, Material industries, Chemical industries, Metals recycling, Waste paper recycling, Paper recovery, Paper recovery from urban waste, Particulate collection.

CVLE 731-SURFACE WATER POLLUTION CONTROL (3Crs.):
CVLE 732-EIA FOR WATER AND WASTEWATER PROJECTS (3Crs.):
Characteristics of (raw water, surface water and ground water, domestic sewage, storm runoff, industrial wastewater), Capital cost of treatment works (civil, mechanical, electrical and control), Maintenance and operation cost benefits from (water, gas, sludge), Recycle water price in the future, Environmental impacts.