Faculty of Engineering
2015-2016 Fall Semester Graduate Courses

CIVL550 Special Topics in Geotechnical Engineering
CIVL565 Pavement Management Systems
CIVL694 Project Management
CMPE532 Constraint Programming
CMPE536 Metaheuristics
CMPE547 Queuing Networks for Computer Applications
CMPE574 Biometrics
EE 521 Linear Systems Theory - I
EE 532 Advanced Antenna Theory
EE 571 Probability Theory and Stochastic Processes
EE 583 Digital Image Processes
IENG509 Occupational Safety and Health Engineering
IENG511 Optimization Theory
IENG513 Probabilistic Models
IENG514 Stochastic Processes and Applications
IENG538 Supply Chain Management
ME 522 Fracture Mechanics
MENG546 Advanced Internal Combustion Engines
MENG548 Power Generation Systems
MENG555 Computational Fluid Dynamics
CIVL 550 Special Topics in Geotechnical Engineering (3, 0) 3
Advanced topics of special interest to graduate students on recent developments in geotechnical engineering. Specific topics and prerequisites identified for each section and varied from term to term. The topics selected by the lecturer for this term are included in the course outline.

CIVL 565 Pavement Management Systems (3, 0) 3

CIVL 694 Project Management (3, 0) 3
The project management context; Introduction to project management, project management context, project management processes. Project management knowledge areas; project integration management, Project scope management, project time management, project cost management, project quality management, project human resources management, project communication management, project risk management, project procurement management.

CMPE 532 Constraint Programming (3, 0) 3
Many computational problems can formulated as variables that take values from a certain domain, and restrictions on those values. Constraint programming is a problem solving technique that incorporates the idea of specifying a solution in terms of variables and restrictions on the values the variables. It benefits from methods and techniques of operations research, programming languages and artificial intelligence. It has been successfully applied to problems in scheduling, combinatorial optimization, diagnosis and reasoning, among others.

CMPE 536 Metaheuristics (3, 0) 3
Heuristics and meta-heuristics, neighborhood search, local and global optimization, simulated annealing, greedy randomized adaptive search, tabu search, evolutionary algorithms, ant-colony optimization, Lagrangean relaxation, hybrid methods, performance evaluation oh meta-heuristics.

CMPE 547 Queuing Networks for Computer Applications (3, 0) 3
Basic probability and statistics overview, transforms, discrete and continuous time Markov chains, steady-state solutions of Markov chains, queuing systems, queuing networks and their applications in computer systems.

CMPE 574 Biometrics (3, 0) 3
Introduction to biometrics, person recognition, modules of biometric systems, biometric functionalities: verification and identification, biometric system errors and performance measures, the design cycle of biometric systems, applications of biometric systems, face recognition, iris recognition, fingerprint recognition, additional biometric traits, introduction to multibiometrics
EE 521 Linear Systems Theory – I (3,0)3
Linear spaces and linear operators. Dynamical system representation, system properties. Linear differential system, impulse response matrices, the adjoint system. Linear time-invariant differential system: modal decomposition, controllability and observability, canonical decomposition.

EE 532 Advanced Antenna Theory (3,0)3

EE 571 Probability Theory and Stochastic Processes (3,0)3

EE 583 Digital Signal Processing (3,0) 3

IENG509 Occupational Safety and Health Engineering (3,0) 3
This course is designed to introduce the student with the principles of safety and health hazards in industrial environment. It provides students with fundamentals of measurement, evaluation, regulation, and control of hazardous conditions, toxic substances, physical agents, and dangerous processes in the industrial environment. Skills development in record keeping, risk assessment and accident cause analysis will also be emphasized. This course will prepare the student for workplace safety and management.

IENG511 Optimization Theory (3,0) 3
Convex analysis; optimality conditions; methods for unconstrained and constrained nonlinear optimization; linear programming and linear goal programming. Quadratic programming; geometric programming; dynamic programming; multi-objective optimization methods; integer programming.
IENG513 Probabilistic Models (3,0) 3
Axiomatic approach to probability; conditional probability; random variable. Commonly used discrete and continuous distributions. Expectation of a random variable; jointly distributed random variables; marginal and conditional distributions; independent random variables. Multinomial and multivariate normal distributions. Functions of random variables, moments, conditional expectation, m.g.f. and p.g.f., Markov inequality, law of large numbers, central limit theorem. Discrete-time Markov chains, Kolmogorov-Chapman equations, classification of states, steady-state probabilities. Applications from different areas.

IENG514 Stochastic Processes and Applications (3,0) 3

IENG538 Supply Chain Management (3,0) 3
Supply chain management; new product development; management and control of purchasing and logistics management systems. Strategic orientation toward the design and development of the supply chain for purchasing, materials, and logistics systems. Total Quality Management to assess and assure customer satisfaction. Global strategies. Expert systems for continuous improvement of the supply chain.

MENG522 Fracture Mechanics (3,0) 3

MENG546 Advanced Internal Combustion Engines (3,0) 3

MENG548 Power Generation Systems (3,0) 3

MENG555 Computational Fluid Dynamics [CFD] (3,0) 3
Introduction, vector and tensor algebra, Governing equations, Equilibrium equations, Diffusion equation, Euler equation, Advection equations, advection-diffusion equation, boundary and initial conditions, Permeative and stream function-vorticity approach, Approximate methods. Finite difference, weighted residual-finite elements, finite volume, Accuracy and error analysis, Higher order schemes, Staggered grid concept, Pressure correction schemes, Flow in porous media, turbulent flow modeling.