

ENGINEERING (ENGG)

ENGG*6000 Advanced Heat and Mass Transfer Unspecified [0.50]

Basic physical principles of transport phenomena. Heat and mass transfer methods for physical systems. Time and volume averaging. Dimensional analysis.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6010 Assessment of Engineering Risk Unspecified [0.50]

The question of "how safe is safe enough?" has no simple answer. In response, this course develops the bases by which we can assess and manage risk in engineering. Course deals with fate and transport issues associated with risk, as relevant to engineering and how these aspects are employed in the making of decisions. Students are expected to have already taken a relevant undergraduate course in statistics (STAT*2040, STAT*2120, or equivalent).

Department(s): School of Engineering

Location(s): Guelph

ENGG*6020 Advanced Fluid Mechanics Unspecified [0.50]

Laminar and turbulent flow. Turbulence and turbulence modelling. Boundary-layer flow. Compressible flow. Potential flow.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6030 Finite Difference Methods Unspecified [0.50]

Numerical solution of partial differential equations of flow through porous media; flow of heat and vibrations; characterization of solution techniques and analysis of stability; convergence and compatibility criteria for various finite difference schemes.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6050 Finite Element Methods Unspecified [0.50]

Boundary-value problems. Methods of approximation. Time dependent problems. Isoparametric elements. Numerical integration. Computer implementation. Mesh generation and layouts. Two-dimensional finite elements.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6060 Engineering Systems Modelling and Simulation Unspecified [0.50]

A study of theoretical and experimental methods for characterizing the dynamic behaviour of engineering systems. Distributed and lumped parameter model development. Digital simulation of systems for design and control.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6070 Medical Imaging Unspecified [0.50]

Digital image processing techniques including filtering and restoration; physics of image formation for such modalities as radiography, MRI, ultrasound. Offered in conjunction with ENGG*4660. Extra work is required for graduate students.

Prerequisite(s): ENGG*3390

Restriction(s): Credit may be obtained for only one of ENGG*4660 or ENGG*6070.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6080 Engineering Seminar Unspecified [0.00]

The course objective is to train the student in preparing, delivering and evaluating technical presentations. Each student is required to: (a) attend and write critiques on a minimum of six technical seminars in the School of Engineering; and (b) conduct a seminar, presenting technical material to an audience consisting of faculty and graduate students in the school. This presentation will then be reviewed by the student and the instructor.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6090 Special Topics in Engineering Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas which are applicable to several of the engineering disciplines in the School of Engineering.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6100 Machine Vision Unspecified [0.50]

Computer vision studies how computers can analyze and perceive the world using input from imaging devices. Topics covered include image pre-processing, segmentation, shape analysis, object recognition, image understanding, 3D vision, motion and stereo analysis, as well as case studies.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6110 Food and Bio-Process Engineering Unspecified [0.50]

Kinetics of biological reactions, reactor dynamics and design. Food rheology and texture; water activity and the role of water in food processing; unit operations design-thermal processing; and drying, freezing and separation processes.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6120 Fermentation Engineering Unspecified [0.50]

Modelling and design of fermenter systems. Topics include microbial growth kinetics, reactor design, heat and mass transfer. Instrumentation and unit operations for feed preparation and product recovery. An undergraduate course in each of microbiology, heat and mass transfer, and biochemistry or bioprocess engineering is required for this course.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6130 Physical Properties of Biomaterials Unspecified [0.50]

Rheology and rheological properties. Contact stresses between bodies in compression. Mechanical damage. Aerodynamic and hydro-dynamic characteristics. Friction.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6140 Optimization Techniques for Engineering Unspecified [0.50]

This course serves as a graduate introduction into combinatorics and optimization. Optimization is the main pillar of Engineering and the performance of most systems can be improved through intelligent use of optimization algorithms. Topics to be covered: Complexity theory, Linear/Integer Programming techniques, Constrained/Unconstrained optimization and Nonlinear programming, Heuristic Search Techniques such as Tabu Search, Genetic Algorithms, Simulated Annealing and GRASP.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6150 Bio-Instrumentation Unspecified [0.50]

Instrumentation systems. Transducers. Amplifier circuits. Recording methods. Spectroscopy & colorimetry. Radiation, humidity, pH and noise measurements. Chromatography.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6160 Advanced Food Engineering Unspecified [0.50]

Application of heat and mass transfer, fluid flow, food properties, and food- processing constraints in the design and selection of food process equipment. Development of process specifications for the control of the flow of heat and moisture and the associated microbial, nutritional and organoleptic change in foods. Food system dynamics and process development.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6170 Special Topics in Food Engineering Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of food engineering.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6180 Final Project in Biological Engineering Unspecified [1.00]

A project course in which a problem of advanced design or analysis in the area of biological engineering is established, an investigation is performed and a final design or solution is presented.

Restriction(s): Restricted to Master of Engineering students in the biological engineering field.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6190 Special Topics in Biological Engineering Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of biological engineering.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6260 Colloids, Interfaces and Emulsions: Concepts and Practical Applications Winter Only [0.50]

This course focuses on the theory and the applications of colloid and interface science in the environmental, chemical, and food sectors. Major topics include the forces of interactions between colloids, the stabilization and destabilization of emulsions and foams, and polymeric fluids and gels.

Prerequisite(s): CHEM*1040 and CHEM*1050

Department(s): School of Engineering

Location(s): Guelph

ENGG*6270 Advanced Estimation Theory Winter Only [0.50]

This course provides a theoretical and practical understanding of advanced state and parameter estimation theory. Topics include, but are not limited to: linear and nonlinear models, system and measurement noise distributions, observers, optimal filters, robust strategies, and written communication skills. Students should have background knowledge in linear algebra, programming, and systems and control theory.

Prerequisite(s): ENGG*2400 or ENGG*3410

Department(s): School of Engineering

Location(s): Guelph

ENGG*6290 Special Topics in Mechanical Engineering Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of mechanical engineering.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6300 Research Methods in Bioengineering Unspecified [0.50]

Research methodologies used in bioengineering are reviewed and assessed in the context of a diverse range of applications: biomechanics, control and instrumentation, ergonomics, diagnostic tools, biomaterials and food safety. The scientific method is discussed in terms of defining research problems, appropriate tests and hypotheses, experimental methods, data analysis and drawing conclusions. The objective is to guide students as they develop a coherent research proposal and deepen their understanding of the breadth of the discipline.

Offering(s): Alternate years

Restriction(s): Instructor consent required.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6310 Advanced Electromechanical Devices Unspecified [0.50]

Course covers: switched reluctance motor, brushless motor, linear motor, axial flux motor, and harmonic drive motor with applicable actuators. Other topics introduced include: Electromagnetic micro power generation, design and analysis of cooling systems and control mechanism. Background in electromagnetism required.

Offering(s): Alternate years

Department(s): School of Engineering

Location(s): Guelph

ENGG*6320 Advanced Topics in Mechatronics Unspecified [0.50]

This course covers materials related to mechatronics systems in terms of dynamics, control, sensing, estimation. The course covers advanced topics in these areas and provides students the tools to model, analyze, and control these systems. The focus is on vehicles and robots (mobile robots).

Department(s): School of Engineering

Location(s): Guelph

ENGG*6330 Thermal Design of Heat Exchangers Winter Only [0.50]

This course provides students with practical experience in designing and modeling of heat exchangers for different applications. Students will apply theory and knowledge of heat and mass transfer, thermodynamics, and fluid mechanics to the design of heat exchanger devices for different applications. Students are expected to have already taken relevant undergraduate courses (ENGG*2230, ENGG*3260, ENGG*3370 and ENGG*3430, or equivalents).

Department(s): School of Engineering

Location(s): Guelph

ENGG*6340 Bioenergy and Biofuels Unspecified [0.50]

Theoretical and hands-on experience in bio-renewable energy areas prepares students from diverse backgrounds for a career in the biorefinery industry, academia, or entrepreneurial endeavors. Also deals with the technologies of converting biomass into upgraded energy, value added products, fuels, and chemicals. Thermodynamics background helpful.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6350 Flow Induced Vibrations Unspecified [0.50]

Course covers fluid-structure interaction problems with an emphasis on analytical and numerical methods. Topics include vortex and turbulence induced vibration, galloping and flutter, fluid-elastic instability, and acoustic resonance. Various case studies and applications will be discussed. Background in fluid mechanics and vibrations required.

Offering(s): Annually

Department(s): School of Engineering

Location(s): Guelph

ENGG*6360 Fuel Cell Technology Unspecified [0.50]

Examination of principles governing fuel cell technology and the technical challenges associated with developing fuel cell systems. Topics include the chemical thermodynamics and electrochemical kinetics of fuel cells, the evolution of fuel cell technology, and fuel cell system design. Background in materials and thermodynamics required.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6370 Heat Transfer in Porous Medium Unspecified [0.50]

Course covers general conservation equations for studying the flow and heat transfer through porous media. Application and case studies of porous materials will be discussed. Modelling techniques will be shown for a particular application area. Background in Heat Transfer required.

Offering(s): Annually

Department(s): School of Engineering

Location(s): Guelph

ENGG*6380 Simulation Analysis of Discrete Event Systems Unspecified [0.50]

Many complex engineering, operations, and business systems can be modeled as discrete-event systems. Efficient management and operation of these systems requires simulation to study their performance. Case studies and applications will be presented and discussed.

Offering(s): Annually

Department(s): School of Engineering

Location(s): Guelph

ENGG*6390 Final Project in Mechanical Engineering Unspecified [1.00]

A project course in which a problem of advanced design or analysis in the area of mechanical engineering is established, an investigation is performed and a final design or solution is presented.

Restriction(s): Restricted to Master of Engineering students in the mechanical engineering field.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6400 Mobile Devices Application Development Unspecified [0.50]

This course provides an introduction to developing applications for mobile devices. The emphasis will be on the fundamentals of mobile application programming. This is primarily a project-based course in which the goal is to produce a working app by the end of the course. The purpose of this course is to create new inter-disciplinary applications of mobile devices. Graduate students from all disciplines at the University of Guelph are invited to take the course for credit.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6410 Professionalism and Ethics Fall and Winter [0.50]

This course provides a background for the reflective engineer who wants to explore the positive effect of ethics on engineering practice. It helps design practitioners understand how technology and its impact on society can be positively shaped by consideration of non-engineering values during the design process and how these values can be introduced into designs.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6440 Advanced Biomechanical Design Unspecified [0.50]

Biomechanical Design from concept through prototyping and testing. This course will investigate and apply techniques used for biomechanical design including reverse engineering, solid modelling, geometric tolerancing, testing and rapid prototyping.

Restriction(s): Instructor signature required.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6450 Queueing Theory and Traffic Modeling Modeling Data Unspecified [0.50]

Network traffic modeling. Transient and steady-state analysis of Markov chains. Queueing analysis. Admission and access control. Flow control protocols. Congestion control. End-to-end performance bounds analysis.

Restriction(s): Instructor consent required.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6460 Engineering Leadership Winter Only [0.50]

This course introduces engineering students to leadership concepts and theory in the context of application to the engineering profession and practice. The focus is on developing practical leadership knowledge, skills and attitudes, starting from the personal level and extending to application in the organizations and society. The content is presented and assessed through a blend of lectures, readings, case studies, discussions, presentations, workshops, reflective practice and a major project.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6470 Solidification and Processing of Metals and Alloys Winter Only [0.50]

This course examines the fundamental principles of metal and alloy solidification. Aspects of nucleation, grain, growth, dendrite formation in casting and welding processes are examined. Thermal analysis, solidification defects and alloy characterization are also covered. Students are expected to have already taken undergraduate courses in materials science and manufacturing processes (ENGG*2120 and ENGG*2180, or equivalents).

Department(s): School of Engineering

Location(s): Guelph

ENGG*6480 Advanced Topics in Mechanical Systems**Design Unspecified [0.50]**

Introduces advanced design methodologies applicable to mechanical systems. Includes the following topics: materials selection; specialized design methods such as concurrent engineering, design for reliability and life cycle design; application of biologically inspired modeling, optimization methods and finite element analysis; integration of various tools to solve a specific engineering problem; implications of design decisions on sustainability and environment; and utilizing different software packages. Students are expected to have already taken undergraduate courses in materials science and machine design (ENGG*2120 and ENGG*3280, or equivalents).

Department(s): School of Engineering

Location(s): Guelph

ENGG*6490 Nonlinear and Intelligent Control With Applications to Mechatronic Systems Winter Only [0.50]

The aim of this course is about nonlinear and intelligent control systems for mechatronics applications (mixture of theory and applications). Students will also learn about nonlinear systems and important concepts associated with them. Important control techniques both for linear and nonlinear systems will be taught (focus will be on nonlinear). Applications of various control techniques for vehicles and robotic systems will be taught as well. This course is suitable for students who have some background in control and mechatronics (ENGG*2400 and ENGG*3410, or equivalents).

Department(s): School of Engineering

Location(s): Guelph

ENGG*6500 Introduction to Machine Learning Unspecified [0.50]

The aim of this course is to provide students with an introduction to algorithms and techniques of machine learning particularly in engineering applications. The emphasis will be on the fundamentals and not specific approach or software tool. Class discussions will cover and compare all current major approaches and their applicability to various engineering problems, while assignments and project will provide hands-on experience with some of the tools.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6510 Analog Integrated Circuit Design Unspecified [0.50]

In this course, operating principles and design techniques of analog integrated circuits are introduced with emphasis on device and system modelling. These circuits include analog and switched-capacitor filters, data converters, amplifiers, oscillators, modulators, circuits for communications, sensor readout channels, and circuits for integrated memories. It is recommended that students are familiar with the fundamentals of linear systems, circuit analysis, and electronic devices.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6520 VLSI Digital Systems Design Unspecified [0.50]

This course will introduce the principles of VLSI MOSFET digital design from a circuit and system perspective. Advanced topics include: power issues related to each level of design abstraction; voltage and frequency scaling; power to speed tradeoffs; ASIC digital design flow; Verilog integration; ASIC case studies. It is recommended that students are familiar with the fundamentals of digital circuits and electronic devices.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6530 Reconfigurable Computing Systems Unspecified [0.50]

This course serves as a graduate introduction into reconfigurable computing systems. It introduces students to the analyses, synthesis and design of embedded systems and implementing them using Field Programmable Gate Arrays. Topics include: Programmable Logic devices, Hardware Description Languages, Computer Aided Design Flow, Hardware Accelerators, Hardware/Software Co-design techniques, Run Time Reconfiguration, High Level Synthesis. It is recommended that students are familiar with the fundamentals of digital design and hardware description languages.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6540 Advanced Robotics Unspecified [0.50]

This course is intended for graduate students who have some knowledge and interest in robotics. The course covers modelling, design, planning control, sensors and programming of robotic systems. In addition to lectures, students will work on a term project in which a problem related to robotics systems will be studied.

Restriction(s): Instructor's signature required.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6550 Intelligent Real-Time Systems Unspecified [0.50]

Soft real-time systems, hard real-time systems, embedded systems, time handling and synchronization, deadlines, preemption, interruption, RTS languages, RTS/ operating systems, system life-cycle, petri nets, task scheduling and allocation, fault-tolerance, resource management, RTS/ search techniques, dealing with uncertainty.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6560 Advanced Digital Signal Processing Unspecified [0.50]

Discrete-time signals and systems, z transform, frequency analysis of signals and systems, fourier transform, fast fourier transform, design of digital filters, signal reconstruction, power spectrum estimation.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6570 Advanced Soft Computing Unspecified [0.50]

Neural dynamics and computation from a single neuron to a neural network architecture. Advanced neural networks and applications. Soft computing approaches to uncertainty representation, multi-agents and optimization.

Prerequisite(s): ENGG*4430

Department(s): School of Engineering

Location(s): Guelph

ENGG*6580 Advanced Control Systems Unspecified [0.50]

This course will start with state space analysis of multi-input multi-output control systems. Then state space design will be presented. After that, nonlinear control systems and soft computing based intelligent control systems will be studied. Finally, hybrid control systems, H infinite control and uncertainty and robustness in control systems will be addressed.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6590 Final Project in Engineering Systems and Computing Unspecified [1.00]

A project course in which a problem of advanced design or analysis in the area of Engineering Systems and Computing is established by the student, an investigation is performed, and a report on the final design or solution selected is presented.

Restriction(s): Restricted to Master of Engineering students in the engineering systems and computing field.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6600 Special Topics in Engineering Systems and Computing Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of Engineering Systems and Computing.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6610 Urban Stormwater Management Unspecified [0.50]

Continuous stormwater management models and model structure. Catchment discretization and process disaggregation. Pollutant build-up, wash off and transport. Flow and pollutant routing in complex, looped, partially surcharged pipe/channel networks including pond storage, storage tanks, diversion structures, transverse and side weirs, pump stations, orifices, radial and leaf gates and transient receiving water conditions (including tides). Pollutant removal in sewer networks, storage facilities and treatment plants.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6630 Environmental Contaminants: Fate Mechanisms Unspecified [0.50]

Analysis of fate mechanisms associated with environmental contaminants. Focus on substances which are generally considered to be hazardous to humans, or other animal life at low concentrations. Study of physicochemical properties and fate estimation on control and remediation strategies. Quantitative analysis of contaminant partitioning and mass flows, including cross-media transport and simultaneous action of contaminant fate mechanisms.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6650 Advanced Air Quality Modelling Unspecified [0.50]

Analysis of analytical and computational models used to predict the fate of airborne contaminants; role of air quality models for the solution of engineering-related problems; analysis of important boundary layer meteorology phenomena that influence the fate of air pollutants; conservation equations and mathematical solution techniques; model input requirements such as emissions inventories; Gaussian models; higher-order closure models; Eulerian photochemical grid models.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6660 Renewable Energy Unspecified [0.50]

The engineering principles of renewable energy technologies including wind, solar, geothermal and biomass will be examined, including technology-specific design, economic and environmental constraints. Students will compare the relative merits of different energy technologies and gain a knowledge base for further study in the field.

Restriction(s): Restricted to Engineering students.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6670 Hazardous Waste Management Unspecified [0.50]

This course will define the different types of hazardous wastes that currently exist and outline the pertinent legislation governing these wastes. Information will be presented on different ways to handle, treat and dispose the hazardous waste, including separation, segregation, minimization, recycling and chemical, physical, biological, and thermal treatment. Also to be discussed are hazardous waste landfills and site remediation technologies. Specifics include design and operation of hazardous landfill sites, handling and treatment of leachate, comparison of pertinent soil remediation technologies. Case studies will be reviewed.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6680 Advanced Water and Wastewater Treatment Unspecified [0.50]

This design course will discuss advanced technologies not traditionally covered during an undergraduate curriculum. An important consideration will be the reuse of water.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6720 Advanced Topics in Groundwater Contamination and Remediation Unspecified [0.50]

This course is an advanced, graduate level, course dealing with the important concepts associated with groundwater flow in fractured rock and field methods for characterizing groundwater flow and quantifying transport in bedrock at both the borehole and flow system scales. Fractured rock hydrology pertains to numerous engineering challenges from mining, waste containment, upstream oil/gas geothermal water supply and watershed/ecosystem management. Students are recommended to have already taken a relevant undergraduate course (ENGG*2230, ENGG*3220 or ENGG*3670).

Offering(s): Alternate years. First offering Fall 2023.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6740 Groundwater Modelling Unspecified [0.50]

Introduction to current groundwater issues, definition of terms, review of fundamental equations describing fluid and contaminant transport in saturated groundwater zones. Mathematical techniques (analytical, FE and FD) for the solution of the fundamental equations. Application of numerical groundwater models to a variety of situations. Case studies. Review of groundwater models used in industry.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6760 Groundwater Flow Systems Unspecified [0.50]

This course concerns groundwater flow systems and the role of aquitards with and without pumping for water supply. Representative geologic domains will be examined using multiple types of evidence to discern flow system characteristics and present various conceptual models from field-based research studies. Students are recommended to have already taken a relevant undergraduate course (ENGG*2230, ENGG*3220 or ENGG*3670).

Offering(s): Alternative years.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6790 Special Topics in Environmental Engineering Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of environmental engineering.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6800 Deterministic Hydrological Modelling Unspecified [0.50]

Deterministic hydrological models. Function of watershed models for hydraulic design, environmental assessment, operation of water control structures, flood warning. Calculation algorithms.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6820 Measurement of Water Quantity and Quality Unspecified [0.50]

This course covers techniques used to measure rates of movement and amounts of water occurring as precipitation, soil water, ground water and streamflow. Available measurements of water quality are surveyed. Calculation procedures involved in the use of indirect indicators of water quantity and quality individually and in combination are described.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6840 Open Channel Hydraulics Unspecified [0.50]

Basic concepts, energy principle; momentum principle; flow resistance; non-uniform flow; channel controls and transitions; unsteady flow; flood routing.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6860 Stream and Wetland Restoration Design Unspecified [0.50]

Explores the multi-disciplinary principles of stream and wetland restoration and the tools and techniques for restoration design. Restoration design is approached from a water resources engineering perspective with emphasis on hydrological and hydraulic techniques. Numerous case studies are examined as a means to identify more successful design approaches.

Prerequisite(s): ENGG*3650

Department(s): School of Engineering

Location(s): Guelph

ENGG*6880 Soil Erosion and Fluvial Sedimentation Unspecified [0.50]

Students will be able to (i) describe processes related to soil erosion by water, (ii) describe processes related to fluvial sedimentation, (iii) evaluate and prescribe structural and non-structural control methods, and (iv) run at least one soil erosion/fluvial sedimentation computer model if the course is satisfactorily completed.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6900 Final Project in Water Resources Engineering Unspecified [1.00]

A project course in which an advanced design problem in the area of watershed engineering is established, a feasibility investigation performed and a final design presented.

Restriction(s): Restricted to Master of Engineering students in the water resources engineering field.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6910 Special Topics in Water Resources Engineering Unspecified [0.50]

A course of directed study involving selected readings and analyses in developing knowledge areas of water resources engineering.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6950 Final Project in Environmental Engineering Unspecified [1.00]

A project course in which a problem of advanced design or analysis in the area of environmental engineering is established, an investigation is performed and a final design or solution is presented.

Restriction(s): Restricted to Master of Engineering students in the environmental engineering field.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6960 Applied Engineering Design I Unspecified [0.50]

This course focuses on applying the knowledge gained in advanced engineering science and design courses on team-based engineering projects that may be community-based or industry sponsored. Students collect and analyze information and synthesize solutions taking into account significant technological, commercial, socio-economical, and environmental considerations. Additionally, the teams prepare a project proposal with a clear problem definition and methodology that may be completed in ENGG*6970.

Restriction(s): Restricted to Master of Engineering students.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6970 Applied Engineering Design II - Major Research Project [1.00]

This course builds upon knowledge foundations and team-based project proposals from ENGG*6960. Student design teams work in consultation with a faculty advisor to develop a design concept through detail design, prototyping (virtual or physical) and testing phases. Students apply advanced engineering science knowledge and develop skills in computer-assisted design, reverse engineering and additive manufacturing. The course culminates with submission of a written report, delivery of an oral presentation and a prototype demonstration. Lecture-based case studies are drawn from across engineering disciplines to illustrate fundamental design principles of reliability, safety, sustainability and cost.

Prerequisite(s): Take ENGG*6960

Restriction(s): Restricted to Master of Engineering students.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6980 Special Topics in Computer Engineering Unspecified [0.50]

This course addresses specialized topics in one or more aspects of Computer Engineering not covered by other graduate courses. Includes selected readings and thorough analyses in emerging knowledge areas, advanced engineering tools, and current technical developments. May be repeated for credit as topics vary.

Department(s): School of Engineering

Location(s): Guelph

ENGG*6990 Final Project in Computer Engineering Unspecified [1.00]

An independent project carried out under the supervision of a Computer Engineering faculty member in which an advanced modelling or design problem and the desired outcomes are defined, possible solutions are synthesized and analyzed, and a final model or design is evaluated. Regular meetings, final report, and presentation required.

Restriction(s): Restricted to Master of Engineering students in the computer engineering field.

Department(s): School of Engineering

Location(s): Guelph