

School	School of Engineering
Major	Masters of Science In Electrical Engineering

Major Requirements			
Code	Title	Credits	Description
EENG515	Introduction to renewable Energy	3	This is an introductory course to the technologies of renewable energy (Wind, Solar, Biomass, Fuel cell, etc..) and their applications. Basic concepts and real-life examples will be covered throughout the course. Additional mathematical concepts will be covered such as Betz limit for wind, limit of efficiency of WEC point absorber, etc.
EENG695A	Master Thesis(Part I)	3	The Master's Project course is six credits practical and research course. The master project is spread over two semesters. Students are requested to conduct a research relevant to the field of specialty; ending up with a thesis describing methodology; applications and results. The course also includes producing a prototype of the research subject (numerical model, __physical application).
EENG655L	Electric Drives Lab	2	This lab covers controlled rectifiers, AC voltage controllers and static switches, DC drives (single phase, three phase and DC-DC converter drives and control of DC drives), AC drives (Induction motor drives, control of induction motors, synchronous motor drives, control of synchronous motors and stepper motor control) and gate drive circuits.
EENG655	Electric Drives	3	This course describes the basic characteristics of dc and ac electric drives and their control parameters. It examines the various methods of control, and also covers the four-quadrant drives and their control requirements as well as their applications.
EENG640	Power System Protection & Switchgear	3	Study of power system faults and application of relays for power system protection. Review of symmetrical components as applied fault currents.
EENG611	Power Transmission Systems	3	This course is divided into two parts: electrical and mechanical design and analysis. The electrical part includes topics such as basic concepts, extended review of overhead transmission line parameters and steady state performance, underground cables and gas-insulated lines, power transmission by means of direct current. In the mechanical part, special attention is given to the construction of overhead transmission lines. Sag and tension of the cables are also included in the analysis.
EENG565	Power Electronics II	3	This course investigates the different power electronics components and applications. It present converters used for AC machinery control (Inverters and AC-AC controllers) used in most applications. Their structures, switching techniques, harmonic content and performances are discussed.

EENG565L	Power Electronics II Lab	1	This lab introduces experiments to examine power devices and power conversion techniques; power diodes and circuits, diode rectifiers, power transistors, DC-DC converters (choppers), DC-AC converters (PWM inverters), thyristors and resonant pulse inverters. The objective of this course is to cover experimentally all experiments on Feedback UK, to investigate the application of the diodes, thyristors, and IGBT.
EENG561	Power Generation and Control	3	Examines the power generation characteristics, describes the economic dispatch and method of solution, and also covers the dynamic programming for solving economic dispatch and other optimization problems.
EENG571	Power System Modeling	3	Synchronous machine theory and modeling, synchronous machine parameters, constant flux linkage model, Transmission lines equivalent circuit, load modeling concepts, modeling of excitation systems, modeling of steam and prime movers.
EENG511	Power System Analysis and Design	3	This course introduces a comprehensive approach when dealing with unbalanced and faulted systems using the concept of the symmetrical components. It also provides an overview of the basic electrical protection equipments and control when short circuits occur. Transient operation and stability are discussed as well.
EENG521	Power Distribution Systems	3	Distribution system layout, distribution transformers, distribution equipment, distribution substations and distribution line construction. Also covers systems of industrial distribution, low-voltage bus way, and over current protection.
EENG500L	Industrial Systems Automation and Control Lab	1	This lab introduces Programmable Logic Controllers (PLC's) in both simulation and experimental environments. Starting with introduction and basic ON/OFF contacts, it switches to series and parallel circuits designed using the contacts. Two-way circuits are introduced, latching and self-latching circuits are discussed and impulse relays are tested. The students learn to pulse a cycle on rising or falling edge as well as designing and using timers and counters in PLC projects. Multiple "real" applications are performed containing projects controlling heat of an oven, flashing lights, memory usage, conveyor belts and star-delta motor starters. The lab also teaches the student to use WinProLadder software using both LADDER language and STEP instructions.
EENG500	Industrial Systems Automation and Control	3	After completing this course, the student will be able to understand the PLC (Programmable Logic Controllers), which are small computers, dedicated to automation tasks in an industrial environment. The PLC's are programmable power control systems dedicated for electromechanical and electrical systems control: relay control, analog (pneumatic, hydraulic) governors, timing, measurements, control and regulation.

EENG695B	Master Thesis(Part II)	3	The Master's Project course is six credits practical and research course. The master project is spread over two semesters. Students are requested to conduct a research relevant to the field of specialty; ending up with a thesis describing methodology; applications and results. The course also includes producing a prototype of the research subject (numerical model, __physical application).
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