School	
Major	Masters of Science in Electronics Engineering

Major Requirements			
Code	**Title**	**Credits**	**Description**
LENG695A	Master Thesis Project(Part I)	3	The master thesis project is a six-credit research and application course that spans over two semesters. Students are expected to develop a theoretical__an applied model in their respective field of specialization. Students should write a thesis describing the research methodology, implementation and results. The developed model might be a valid numerical simulation, a well-functioning prototype__a well-supported mathematical__scientific model.
EENG560	Transducers, Sensors and Actuators	3	This course explains and illustrates the functioning of a variety of sensors and transducers used in industrial electronics and professional control applications. The course provides the basic physical principles of operation of sensors, it describes the conversion to and from electrical signals and focuses particularly on the data acquisition and signal conditioning chain. Many industrial applications are covered in this course with the analysis of benefits and limitations of different types of sensors.
EENG585	Introduction to Mechatronics	3	This is an introductory course to mechatronics. It introduces some mechatronic systems such as the automotive and aircraft systems. It is coupled with a design project that will teach students to apply the gained knowledge.
EENG500L	Industrial Systems Automation and Control Lab	1	This lab introduces the Programmable Logic Controllers (PLC) in both simulation and experimental environments. Starting from the basics (ON/OFF contacts, impulse relays, rising edge, falling edge, and negated coil) in addition to the different connection that can be done (series and parallel connections). Moreover, it will be introducing the use of latching circuits, timers, counters, comparators and so on
EENG500	Industrial Systems Automation and Control	3	This course covers the fundamentals, concepts, and design of PLC (Programmable Logic Controllers) based systems. The students gain knowledge of PLC programing and automation process control within industrial environment. The students get an overview of electrical distribution and hardwire, industrial hardware, I/O modules, industrial networks systems, and SCADA (Supervisory control and data acquisition) systems. The students get an overview of the PLC's typical applications in the manufacturing industry in addition to hand-on design projects.
EENG612L	Introduction to VLSI Lab	1	This course provides basic digital circuit design knowledge in CMOS technology using appropriate software tools. It covers the main steps of schematic acquisition, simulation, layout placement and routing, and final check rules before manufacturing. The course proposes many application examples going from a component level to complete circuit simulation and implementation levels.
EENG612	Introduction to VLSI	3	This course describes CMOS logic, fabrication and layout, and digital circuit design. In addition, it covers MOS transistor theory: ideal and non-ideal I-V effects, design, and calculations of delay, power, and interconnections for VLSI CMOS IC. It includes an introduction to the VHDL design description language
LENG695B	Master Thesis Project(Part II)	3	The master thesis project is a six-credit research and application course that spans over two semesters. Students are expected to develop a theoretical__an applied model in their respective field of specialization. Students should write a thesis describing the research methodology, implementation and results. The developed model might be a valid numerical simulation, a well-functioning prototype__a well-supported mathematical__scientific model.

EENG512	Electronics for Communication Systems	3	This course describes the basics in communication systems and circuits. It covers amplitude, frequency and phase modulation fundamentals and circuits, digital communication techniques, radio transmitters and receivers, voltage-controlled oscillators (VCOs) and Phase-Locked-Loops (PLLs). This course shows how major system-level constraints can be related to circuit-level specifications and implementation options.
EENG551	Analog Integrated Circuit Design	3	Integrated-circuits devices and modeling. Processing and Layout. Design of basic analog circuits, such as current sources and mirrors, differential amplifiers. Basic amplifier circuits, CMOS opamps, opamp stability and frequency compensation
EENG551L	Analog Integrated Circuit Design Lab	1	The aim of this LAB course is to design basic analog integrated circuits, such as current sources and current mirrors, operational amplifier single stage, operational amplifier double stage
EENG632	Antennas	3	In this course the student will learn to know the key antenna parameters such as: 1: Impedance, beam width, near and far fields radiation patterns, Gain, Bandwidth, etc. 2: will understand the radiation phenomena and the underlying physics and be able to compute the radiation pattern of an antenna. 3: Design simple dipole and patch antennas. 4: Understand the principle of antenna arrays. 5: Be able to evaluate antenna performance and to specify antenna requirements for practical use.
EENG691	Graduate Seminar	1	The Graduate Seminar, EENG691, is designed to provide opportunities for professional development of graduate students.
EENG527	Digital Signal Processing	3	The objective of this course is to build a good understanding of the principles of Digital Signal Processing starting from the theoretical analysis of Discrete Time Systems up to the design and implementation of Digital Filters. Topics include: Analog to Digital Conversion, sampling, quantization, coding, Z-transform and its applications, structures for FIR and IIR systems, design and implementation of Filters using: window, frequency sampling and equiripple filter. In order to provide students with strong foundation of engineering practices and perform a practical application of the acquired knowledges, some design and simulation examples using Matlab are covered.