

School			
Major	Masters of Science in Surveying Engineering		
Major Requirements			
Code	Title	Credits	Description
SURV500	Geographic Information Systems II	3	Design and operation of GIS, concepts of GIS, spatial data management systems, geoprocessing, data base management systems, 3D methods.
SURV510	Remote Sensing	3	Remote sensing principle, infrared and microwave radiation, collectors, geometry of image, Radiometric corrections, remote sensing applications.
SURV530	GPS II	3	Coordinate system in GPS, differential GPS positioning, future of GPS. Geodetic and surveying applications of GPS.
SURV550	Image Processing	3	Introduction to image processing, multi-scale analysis, inverse problem in remote sensing, lower resolution systems, introduction to numerical photogrammetry.
SURV580	Geomatics for Civil Works	3	Specific applications of the principles and techniques introduced in earlier surveying courses are applied to a range of engineering projects in this course. The main emphasis, however, will be on the practical application of this knowledge in practical projects. Linear measurements- field work practice. Leveling, Angular measurement , building setting out, building surveys, roads works- curve calculation, roads works- setting out, drain and pipelines, height tension electricity. Hydrographic survey.
SURV590	Map Projection	3	Theory and classification of map projection, proprieties of different types of projection, distortion in map projection, arc to chord connection, and convergence of the meridians.
SURV615	Surveying application II	3	The practice of surveying has been subjected to dramatic technological changes in the last twenty years; theodolites and steel bands have been replaced by one-man total stations and/or GPS receivers, log tables and simple adding machines by hand-held programmable calculators and/or computers and set squares and drafting tables by computer aided drafting, printers and plotters. All of this new equipment is designed to complete a variety of tasks. They all have limitations and most importantly of all they must all be calibrated so that the results that they provide are correct. Surveyors must be aware of the limitations of the equipment that they use. They must know how to calibrate the equipment and understand how to utilize it in the most effective way.
SURV620	Engineering Transportation and Roads Design	3	Urban transportation planning, public transportation planning, traffic engineering, traffic characteristics, pedestrians, parking. Traffic accident and safety, road classification, traffic management, transport and environment. Traffic noise, traffic pollution, environment oriented transportation planning. This course introduces students to the concept of road location with particular emphasis on the design of the geometric elements of the road including horizontal and vertical curves. The course is comprised of two components; theory of road design and design by CAD. It is expected that students understand the interpretation of a surveyor's field book for plan production and correct standards of plan presentation. The CAD component is an introduction for the student to the flexibility and capability of a civil engineering/surveying design software packages. Traffic volume. Cross section. Highway alignment.

SURV670	Technology Of Construction	3	The main goal of this course is to give an idea about the connection between the surveying engineer and the civil engineer, on the site in the following fields: the soil mechanics, the building components, the construction materials of the buildings and the roads (such as the floors, the panels, the roofing, the frame works, the bituminous materials,□.), the steel, and the piles. The objective of this course to train the students in various techniques in the construction of buildings, especially cost efficient techniques to develop Competencies in assisting supervisors, engineer□s and Contractors and prepare them self for self employment
SURV695A	Master Thesis Project(Part I)	3	This project may be registered for in the last semester before graduation. The project is intended to apply the student's total formal knowledge to a real problem at the appropriate professional level. In this sense it will develop and test the ability to define and analyze the problem, to develop solutions to the problem, to make the necessary decisions, convert ideas into useful outcomes and to cope with the unexpected problems encountered in testing and evaluation. All of this must be accomplished against a tight timescale within resource limitations and with due regard for safety, social and ethical considerations. In short, the project is a good test of overall ability in engineering__surveying__GIS. The project is intended to apply the student's total formal knowledge to a real problem at the appropriate professional level. In this sense it will develop and test the ability to define and analyze the problem, to develop solutions to the problem, to make the necessary decisions, convert ideas into useful outcomes and to cope with the unexpected problems encountered in testing and evaluation. All of this must be accomplished against a tight timescale within resource limitations and with due regard for safety, social and ethical considerations. In short, the project is a good test of overall ability in engineering__surveying__GIS.
SURV695B	Master Thesis Project(Part II)	3	This project may be registered for in the last semester before graduation. The project is intended to apply the student's total formal knowledge to a real problem at the appropriate professional level. In this sense it will develop and test the ability to define and analyze the problem, to develop solutions to the problem, to make the necessary decisions, convert ideas into useful outcomes and to cope with the unexpected problems encountered in testing and evaluation. All of this must be accomplished against a tight timescale within resource limitations and with due regard for safety, social and ethical considerations. In short, the project is a good test of overall ability in engineering__surveying__GIS. The project is intended to apply the student's total formal knowledge to a real problem at the appropriate professional level. In this sense it will develop and test the ability to define and analyze the problem, to develop solutions to the problem, to make the necessary decisions, convert ideas into useful outcomes and to cope with the unexpected problems encountered in testing and evaluation. All of this must be accomplished against a tight timescale within resource limitations and with due regard for safety, social and ethical considerations. In short, the project is a good test of overall ability in engineering__surveying__GIS.
SURV560L	Advanced Digital Photogrammetry Lab	1	Using a digital photogrammetric work station , data handling , Arial block generation , camera calibration , measuring tie points, measuring ground control points, block adjustment, stereo data collecting, automatic DTM generation, rectifying , orthorectifying, mosaicking and generation of orthophoto maps, map compilation.
SURV560	Advanced Digital Photogrammetry	3	Camera calibration ,Scan correct , digital image enhancement ,Arial triangulation, correlation and automatic point matching Automatic, block adjustment , analytical stereomodel, 3D stereo data collection, Digital elevation model, Automatic DTM generation, Automatic production of contour lines, rectification, Orthophotography, Automatic production of orthophoto, mosaicking ,photogrammetric map production process.

Core Requirements			
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ENGG650	Engineering Profession & Ethics	3	Engineering Profession and Ethics is a complete study course on the role of ethics in engineering in their historical, philosophical and professional contexts. The course examines the impact of ethical theories and their application to issues encountered in the engineering profession, such as employee rights, whistle blowing, safety, risk and liability, professional responsibility to consumers and employers, conflicts of interest, codes of ethics, legal obligations, environmental and social responsibility. Through the use of real and hypothetical case studies, the course focuses on developing analysis techniques and applying them to ethical problems through independent critical thinking and moral sensitivity.