

School	School of Engineering		
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has been subjected to dramatic technological changes in the last twenty years; theodolites and steel bands have been replaced by one-man total stations and/or GPS receivers, log tables and simple adding machines by hand-held programmable calculators and/or computers and set squares and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.

SURV630	Drainage and Irrigation	3	Definitions, underground hydraulic applied to draining, fixing dimensions of a draining net work, conception of a draining project, hydraulic of a surface irrigation system, design of a border, furrow and controlled flooding irrigation. Hydraulics of sprinkler and drip irrigation systems design aspects. Definitions, underground hydraulic applied to draining, fixing dimensions of a draining net work, conception of a draining project, hydraulic of a surface irrigation system, design of a border, furrow and controlled flooding irrigation. Hydraulics of sprinkler and drip irrigation systems design aspects.
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(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(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.

SURV520	Underground & Marine Survey	3	The goal of this course is to explain the methods and the tools used to establish the surveying inside the tunnels, the off-shore surveying, and the connection between this work and that accomplished on the Earth surface. introduction to marine survey , marine maps , marine course , Echosounders and depth measurements, combining echosounders and GPS observation , production of marine maps
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.
SURV640	Geotechnical Engineering	3	This course informs the student about the basic studies of kinds of structural building, the different works such as steel, electrical, mechanical works and treats some calculations of stresses and (..) in different members of the construction. This course will also provide to the student the necessary reconnaissance to read the execution maps and control its application on site. The surveyor will have the possibility to interfere with the civil engineer on site for measurement and quantity surveying.
SURV680	Environmental Impact Assessment for Surveying Engineering	3	The aim of the Module is to provide understanding of EIA and confidence with its application and limitations. Broadly the objectives are for students to: appreciate the purpose and role of EIA in the decision-making process; understand the strengths of EIA in regard to environmental management; understand the technical and social/political limitations of EIA; know the administration and procedures that apply in the student's jurisdiction; understand the screening process; understand the scoping process and how it is applied; know the options for estimating environmental and social impacts; know the format of an EIA Report (Environmental Impact Statement, _Environmental Statement); appreciate the factors that assist, and detract, from the usefulness of the EIA Report; Understand the purpose of developing follow-up procedures, and the options for designing these procedures.
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.