MODULE DESCRIPTOR 2019/20

CL209 Land Surveying and Mapping

Registrar: Stella Pytharouli	**Taught To (Programme): MEng/BEng Civil Engineering/Civil and Environmental Engineering**	
Other Lecturers Involved: None	**Credit Weighting: 20 credits**	**Semester: 1 & 2**
Assumed Pre-requisites: basic trigonometric relationships, basic SI units	**Compulsory class**	**Academic Level: 2**

Class Format and Delivery (hours):

Lecture	Tutorial	Laboratory	Coursework	Project	Private Study	**Total**
20	18	7		50	105	200

Class Aim(s)

This class aims to provide a basic understanding of the concepts and application of land surveying for civil engineering purposes and the use of maps and plans in civil engineering.

Learning Outcomes

On completion of the class the student is expected to be able to

LO1 Be able to apply the theory of errors on surveying data and interpret the results.

LO2 Know what the basic surveying principles and apply them to successfully conduct a basic survey.

LO3 Be able to process and correctly use surveying data.

Syllabus

The class will teach the following:

Introduction to Engineering Surveying
Units and the use of map scale
Basic surveying principles
Calculation of azimuths
Theory of errors and survey statistics
Levelling, use of level and surveying staff, levelling procedure
Angle measurement, use of total stations
Traverse surveying and adjustment
Topographic surveying and contour generation
Using optical based survey systems
Setting out engineering structures
Calculations of Earthworks, areas and volumes
Introduction to Global Navigation Satellite Systems

Assessment Criteria

For each of the Course Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1
C1 Be able to estimate and interpret statistical quantities in measurements in surveying.
C2 Be able to apply the basic surveying principles to provide answers to simple surveying problems.

LO2
C1 Be able to set up and use correctly basic surveying instruments, i.e. level and total station.
C2 Be able to design an appropriate field strategy to address a problem in land surveying.
C3 Be able to provide adequate answers to theoretical questions on the area of land surveying.

LO3
C1 Be able to reduce heights from levelling data
C2 Be able to reduce horizontal and vertical angles from measurements using a theodolite
C3 Be able to calculate earthworks, areas and volumes, construct contours from land surveying data and read and understand maps and plans.
C4 Be able to understand and process GNSS data

The standards set for each criterion per Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessments.

Principles of Assessment and Feedback (*https://www.strath.ac.uk/staff/policies/academic/*)

Please state briefly how these are incorporated in this module.

Principle 1: The assessment of the course has been revised to encourage student engagement and understanding. Five different assessment methods are used: exam, online class test, online quiz, brief field work and group report submission. The first three are at individual level, the latter is a group submission. This way personal study is encouraged as well as good teamwork skills. The online test and quizzes are designed in such a way so that feedback is provided to each student within minutes from the completion of the activity. The class test will take place in week 6 (mid Semester 1) to highlight areas of the theory that students need to improve. During the semesters, certain weeks have been specified as Q&A to give students to opportunity to ask questions out-with the class environment and discuss their progress with the tutor on a one-to-one basis.

Principle 2: All assessments are marked in an appropriate, fair and transparent way with pre-specified marking criteria.

Principle 3: Marking criteria are clearly stated in each assessment brief, also communicated to students in the class (week 0/1), on the course page on MyPlace, as well as on each assessment's handing out date.

Principle 4: The course is reviewed every year, based on feedback from students collected in the form of a mid-term and one end-term questionnaire.

Recommended Reading

Main Text Book
Bannister, A., Raymond S. and Baker, R. "Surveying", 7th Edition (1998), Pearson-Prentice Hall, ISBN 0-582-30249-8

Expanded Reading List
Irvine, W. and MacLennan, F. "Surveying for Construction", 5th Edition (2006), McGraw-Hill, ISBN 0077111144.

Schoefield, W. and Breach, M. "Engineering Surveying", 6th Edition (2007), Elsevier, ISBN-13: 978-0-7506-6949-8 (Electronic Access)

PLEASE NOTE:
Students need to gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of an exam.

Resit Arrangements

The re-examination consists only of a 2-hour exam that will be scheduled within the August exam diet. All material taught in Semesters 1 and 2 should be revised for the re-sit exam.

Approved

Programme Director Signature:
Date of Last Modifications: 16 August 2019

Assessment and Feedback Schedule

Class Code	CL209	Class Title	Land Surveying and Mapping

Brief Description of Assessment

Assessment is based on the performance at a 2-hour exam in May exam diet (50%), as well as performance in the four quizzes associated with the four practicals (CL209A - D, 12% total), intermediate online class test (13%) and field project (25%). There is an optional assignment, GNSS_processing, on processing of GNSS data using Trimble Business Centre. This assignment is planned for Semester 2 and has a weight of 15%. Information and details on exactly how the class summary mark is calculated in this case, will be provided in the class.

Indicate in the tables below the Hand-Out (H), Submission (S) and Feedback (F) dates for each lab report/coursework/project and the timing of each Exam/Class Test (E), (T). Include duration of exam in brackets (e.g. E (2)).

Semester 1

Assessment type (& title)	LOs	Weight (%)	Individual / Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
CL209A field practical	2+3	3	Individual		Online quiz*										
CL209B field practical	2+3	3	Individual			Online quiz*									
Cl209C field practical	2+3	3	Individual					Online quiz*							
CL209D field practical	2+3	3	Individual								Online quiz*				
Online class test	1+3	13	Individual							T(1)					
Field project	2+3	25	Individual		H (All tasks)		S(Task 1-2a)								

*The online quiz is REQUIRED in order for the students to be able to attend the associated field practical. Failing to attempt the quiz, will result in disqualification for the field practical and 0 marks awarded.

Semester 2

Assessment type (& title)	LOs	Weight (%)	Individual / Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
Field project	2+3	25	Individual/Group	S(Task 2b-3)		S(Task 4+5)			F(all Tasks)	Field Day	Field day				
GNSS_processing	3	15	Individual				H			S					
Exam	1+2+3	50	Individual												E(2)