

MODULE DESCRIPTION FORM



DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

CL209 Land Surveying and Mapping

| | | | |
|---|--|--------------------------|-------------------------|
| Module Registrar: Stella Pytharouli | Taught To (Course): MEng/BEng Civil Engineering/Civil and Environmental Engineering | | |
| Other Lecturers Involved: | Credit Weighting: 20 | Semester: 1 & 2 | |
| Assumed Prerequisites: basic trigonometric relationships, basic SI units | Compulsory class | Academic Level: 2 | Compulsory class |

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

| Lecture | Tutorial | Laboratory | Groupwork | External | Online | Project | Assignments | Private Study | Total |
|---------|----------|------------|-----------|----------|--------|---------|-------------|---------------|-------|
| 20 | 18 | 8 | 8 | | | | 50 | 96 | 200 |

Educational Aim

This module aims to provide a basic understanding of (1) the concepts and application of land surveying for civil engineering purposes and (2) the use of coordinate systems and satellite geodesy in civil engineering projects.

Learning Outcomes

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

LO1 Understand and quantify errors in measurements in land surveying.

LO2 Understand the basic surveying principles and apply them to successfully conduct a basic land survey.

LO3 Be able to process and correctly use surveying data (levelling data, angle and distance measurements).

LO4 Understand the basic GNSS principles and the quantities GNSS data represent.

Syllabus

The module will include the following:

Semester 1:

Introduction to Land Surveying and revision trig and units, areas, basic maths

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 and distance measurement with use of total stations

Traverse surveying and adjustment

Setting out engineering structures

Semester 2:

Topographic surveying and contour generation

Calculations of Earthworks, areas and volumes

Coordinate Systems and map projections

Introduction to Global Navigation Satellite Systems

Assessment of Learning Outcomes**Criteria**

For each of the Module 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.

LO2

C1 Be able to set up and use correctly basic surveying instruments, i.e. level and total station.

C2 Be able to apply the basic surveying principles to provide answers to simple surveying problems.

C3 Be able to provide adequate answers to questions on the theory 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 total station

C3 Be able to calculate earthworks, areas and volumes, construct contours from land surveying data and understand the relationship between map distances and ground distances.

LO4

C1 Be able to understand GNSS data

C2 Be able to understand how decisions taken during processing of GNSS data can affect results

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

Principles of Assessment and Feedback

(within Assessment and Feedback Policy at:

<https://www.strath.ac.uk/staff/policies/academic/http://www.strath.ac.uk/learnteach/informationforstaff/staff/assessfeedback/12principles/>)

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. The assessment schedule also aims to help students take responsibility of their own learning. Three different assessment methods are used: exam, coursework submission and field group work. The first two are at individual level, the latter is group work. This way personal study is encouraged as well as good teamwork skills. There are a number of formative assessments (not credit bearing), i.e. online revision 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. These assessments aim to help student self-assess their learning and highlight areas of the theory that students need to improve, well before the May exam. During the semesters, certain weeks have been specified as Q&A (revision) 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 and individual feedback as well as general observations for the whole year cohort.

Principle 3: Marking criteria are clearly stated in each assessment brief, also communicated to students in the class, 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 end-term surveys taking place in both Semesters.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

| | Examinations | | | Courseworks | | Projects (Field day) | | |
|-------------------|--------------|----------|----------|-------------|-----------------|----------------------|--------|-----------|
| | Number | Month(s) | Duration | Weighting | Number | Weighting | Number | Weighting |
| | 1 | May | 2hrs | 65% - 90% | 5 (optional) | 25% (in total) | 1 | 10% |
| L/Outcomes | LO1 LO3 LO4 | | | LO3 | | LO2 | | |

Indicate which learning outcomes (L01, L02 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines (*academic weeks*):

Resit Assessment Procedures:

2hr examination in August diet

PLEASE NOTE:

Students must 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 exam. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

Recommended Reading

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

Expanded Reading List

- Uren, J., Price, W.F. "Surveying for engineers", 5th Edition (2010), Palgrave Macmillan, ISBN 9780230221574 (Hard copy available in Strathclyde library - D 526.9024 URE)
- Grant, S. "Setting out for Construction: A practical Guide to Site Surveying" (2019), Costello House Publishing, ISBN 1916068405 (Hard copy available in Strathclyde library - D 692.5 GRA)
- Bannister, A., Raymond S. and Baker, R. "Surveying", 7th Edition (1998), Pearson-Prentice Hall, ISBN 0-582-30249-8 (Hard copies available in Strathclyde library - D 526.9 BAN)
- Irvine, W. and MacLennan, F. "Surveying for Construction", 5th Edition (2006), McGraw-Hill, ISBN 0077111144.

Additional Student Feedback

(Please specify details of when additional feedback will be provided)

| Date | Time | Room No |
|------|------|---------|
| | | |

Session: Additional feedback will be provided whenever needed and appropriate for the students learning

Approved:

Course Director Signature:

Date of Last Modifications: August 2022

(Updated May 2018)

MODULE TIMETABLE

Module Code:

CL209

Module Title:

Land Surveying and Mapping

Brief Description of Assessment:

The module has two compulsory assessments: a field day (weight 10%) and a 2 hour exam in May (weight 65% - 90%). There is an optional coursework consisting of 5 parts. Each part has a weight of 5% (25% in total if students attempt all 5 parts). Students can choose to take any or all of the optional coursework. If they do so, the coursework will contribute to the module summary mark with the corresponding weight (between 5% and 25%, depending on the number of coursework parts a student has submitted)

Assessment Timing:-

Indicate on the table below the start/submission dates for each assignment/project and the timing of each exam/assessment using the dropdowns provided. Dropdowns can be left blank. Add extra notes below the dropdowns.

Please note: Timings can and will change, this should only be used as a guide.

| Semester One | W&D Wk | WK1 | WK2 | WK3 | WK4 | WK5 | WK6 | WK7 | WK8 | WK9 | WK10 | WK11 | Exam Period |
|--------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|---------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | Choose an item. Choose an item. | Choose an item. Choose an item. | Course work Set Choose an item. | Choose an item. Choose an item. | Course work Submit Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. |

| Semester Two | C&D Wk | WK1 | WK2 | WK3 | WK4 | WK5 | WK6 | WK7 | WK8 | WK9 | WK10 | WK11 | Exam Period |
|--------------|------------------------------------|---------------------------------------|------------------------------------|---------------------------------------|------------------------------------|------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| | Choose an item. Choose an item. | Course work Submit Choose an item. | Choose an item. Choose an item. | Course work Submit Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Course work Submit Choose an item. | Project Submission Choose an item. | Project Submission Choose an item. | Project Submission Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. | Choose an item. Choose an item. |

*Submission of coursework is optional

** Project submission: this refers to the field day at Steps. Students are required to attend ONLY one of the three field days