

ES2G7-15 Design, Surveying and Field Practice

25/26

Department

School of Engineering

Level

Undergraduate Level 2

Module leader

Cate Anthony

Credit value

15

Module duration

18 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Design, Surveying and Field Practice

Module aims

This module aims at highlighting the more practical side of civil and construction engineering, providing an introduction to geotechnical engineering, surveying and how design is then translated into practical solution on site.

With the support of professionals, this module will allow student to deal with the issues related to the design and construction processes by means of workshops and on site practical activities.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Surveying:

Planning and control: Whole to part, Geodetic vs plane, Types of survey

Common techniques and equipment: tape, level, theodolite, EDM, GPS
Techniques of measurement and error evaluation and control: Error types and mitigation, Bowditch, Least Squares, GPS
Setting out: profiles, curves
Instrumentation and Monitoring

Introduction to geotechnical design
Soil Mechanics and Engineering Geology
Geotechnical problems and slope stability
Desk and walkover studies
Groundwater and seepage
Introduction to foundation selection and design
Preliminary analysis methods

Field practice:
Introduction to site preparation and management
From design to practical solutions
Health and Safety
Constructionarium

Learning outcomes

By the end of the module, students should be able to:

- Specify appropriate surveying and ground investigation techniques and apply them with due regard to survey control, analysis and purpose. [M12(M), M13(M)]
- Evaluate and interpret topographical and geological survey data. [M3(M), M12(M)]
- Understand and apply geotechnical engineering principles to approach design problems. [M3(M), M7(M), M9(M), M12(M)]
- Use an integrated approach to develop and showcase practical solutions to Civil Engineering design problems taking into consideration construction and management issues. [M4(D), M5(M), M6(M), M13(M), M15(D), M17(M)]
- Appreciate how civil engineers approach and solve design challenges considering codes of practice, safety, sustainability and professional ethics at the core of the process. [M7(M), M8(M), M9(M)]
- Work effectively as a team of engineers to analyse and solve an end-to end design problem. [M16(M)]
- Demonstrate, plan and record self-learning and development as the foundation for lifelong learning/CPD (at least 5 points). [M18(M)]

Indicative reading list

Uren J. & Price B, (2010). Surveying for Engineers. Palgrave Macmillan, 5th ed. ISBN-10: 0230221572, ISBN-13: 978-0230221574

Bannister, A., Raymond S. and Baker R., (1998). Surveying. Prentice Hall, 7th ed. ISBN-10: 0582302498, ISBN-13: 978-0582302495

Barnes, (2016) G.E. Soil Mechanics: Principles and Practice, 4th Ed. ISBN-10: 1137512202, ISBN-13 978-1137512208

Subject specific skills

Ability to conceive, make and realise a component, product, system or process

Ability to develop economically viable and ethically sound sustainable solutions

Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality

Ability to be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional engineering responsibilities

Transferable skills

Communicate (written and oral; to technical and non-technical audiences) and work with others

Plan self-learning and improve performance, as the foundation for lifelong learning/CPD

Exercise initiative and personal responsibility, including time management, which may be as a team member or leader

Awareness of the nature of business and enterprise in the creation of economic and social value

Overcome difficulties by employing skills, knowledge and understanding in a flexible manner

Ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue

Appreciation of the global dimensions of engineering, commerce and communication

Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Study

Study time

Type	Required
Lectures	14 sessions of 1 hour (9%)
Seminars	5 sessions of 1 hour (3%)
Fieldwork	50 sessions of 1 hour (33%)
Online learning (independent)	8 sessions of 1 hour (5%)
Private study	73 hours (49%)
Total	150 hours

Private study description

73 hours of guided independent learning.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time	Eligible for self-certification
Individual Geology Report	30%		Yes (extension)
Final Group Portfolio	70%		No
Final group portfolio including surveying and constructionarium			

Feedback on assessment

Individual and cohort level feedback and coaching will be ubiquitous. The focus on fieldwork and design work will allow detailed and regular discussion between academics and students. Students will also be required to both give and receive feedback on peers' work, a key aspect of the design process and learning outcome of the module.

Availability

Courses

This module is Core for:

- Year 2 of UESA-H216 BEng Civil Engineering
- Year 2 of UESA-H217 MEng Civil Engineering