

ES3G3-30 Structural Engineering Project

27/28

Department

School of Engineering

Level

Undergraduate Level 3

Module leader

Elia Gironacci

Credit value

30

Module duration

25 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

ES3G3-30 Structural Engineering Project

[Module web page](#)

Module aims

The aim of the module is to provide an experience of performing a work-related project on an individual basis (projects will be supervised on a group basis and involve group interaction without influencing an individual character). Students will have the opportunity to apply and demonstrate their capabilities (engineering knowledge, initiative, self-motivation, enthusiasm) to plan, carry out, and control an open-ended design project in civil engineering. Students will enhance their writing, oral, and communication skills through preliminary writing of a proposal, writing interim and final reports that conform to predefined specifications, and giving an oral presentation under specific time constraints. The module will provide students with a simulated experience of working as professional engineers in an industrial organisation.

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.

Definition of a realistic structural work-related project (e.g. building, skyscraper bridge) through a design brief that is characterized by diverse and contradictory aspirations as well as numerous (and

often obscure) constraints that offer the opportunity of various solutions to emerge based on subjective and challenging judgements. Assessment of the design brief with emphasis on the location, architectural and service requirements of the project. Methods to expand on the design brief by gathering all the required information and data relevant to environmental and planning issues, site conditions, material suppliers, collaborators, specialists and other contractors.

Synthesis

of all available information to define a set of clear objectives against which a design solution should

be tested. 'Think outside the box' and renegotiate those constraints of the design brief that prevent an optimum design solution to emerge. Conceptual design and use of sketches prepared to scale to describe a solution for the structural system and how loads are transferred to foundations.

Choice of structural materials, preliminary design of structural members, an approximate method of analysis. 3D linear elastic analysis using structural analysis software. Structural Eurocodes, resistance of members, loads, load combinations, serviceability, and ultimate limit states.

Engineering drawings, drawing conventions, tolerances, limits and fits, assemblies, and CAD applications. Sustainability in design and construction, green economy, and assessment of design solution using a set of criteria of the low-carbon agenda.

Learning outcomes

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

- Choose a concept for a structural system ("conceptual design") that satisfies the location, architectural, and service requirements of a construction project (e.g. bridge, stadium, building, etc).
- Appreciate the concept of a structural system using sketches prepared to scale.
- Critically assess structural materials (e.g. concrete, steel) and their mechanical properties (e.g. strength) for the structural members of a structure.
- Make reasonable initial estimations for the geometry, dimensions, and cross-section size of structural elements (e.g. beams, columns, foundations, etc.).
- Synthesize design calculations and engineering drawings using adequate computational and analytical techniques.
- Demonstrate critical awareness of health and safety, ethics, sustainability and data security in design and construction.
- Deliver a design that conforms to a detailed specification and in accordance with standards and regulations.
- Demonstrate coherently constructed ideas and information, communicated for a range of work/practice, academic and/or non technical audiences.

- Take responsibility for the management of individual learning demonstrated in individual work/practice contexts and in a collaborative environment.
- Plan and manage a project from the design process to a deliverable outcome, including management of its quality, and understanding the commercial, economic, social environment of the project.

Indicative reading list

[Reading lists can be found in Talis](#)

[Specific reading list for the module](#)

Subject specific skills

No subject specific skills defined for this module.

Transferable skills

No transferable skills defined for this module.

Study

Study time

Type	Required
Lectures	19 sessions of 1 hour (6%)
Tutorials	26 sessions of 1 hour (9%)
Work-based learning	200 sessions of 1 hour (67%)
Private study	55 hours (18%)
Total	300 hours

Private study description

55 hours of private study

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A3

	Weighting	Study time	Eligible for self-certification
Assessment component			
Interim individual report	20%		No
Interim individual report (15 pages)			
Reassessment component is the same			
Assessment component			
Final individual report	50%		No
Final individual report (30 pages)			
Reassessment component is the same			
Assessment component			
Individual oral presentation	20%		No
Individual oral presentation (15 minutes)			
Reassessment component is the same			
Assessment component			
Logbook / Portfolio of Evidence	10%		No
Logbook			
Reassessment component is the same			

Feedback on assessment

Detailed marking and feedback on assignments (interim report, final report, logbook, oral

presentation). Verbal feedback during tutorials.

Availability

Courses

Course availability information is based on the current academic year, so it may change.

This module is Core for:

- Year 3 of DESA-H221 Undergraduate Civil and Infrastructure Engineering (Non-integrated Degree Apprenticeship)