

UNIVERSITY OF WARWICK

Proposal Form for New or Revised Modules (MA1 - version 7 - April 2014)

Approval information	
Approval Type	<input type="checkbox"/> New module <input checked="" type="checkbox"/> Revised module <input type="checkbox"/> Discontinue module
Date of Introduction/Change	02/10/2018
If new, does this module replace another? If so, enter module code and title:	
If revised/discontinued, please outline the rationale for the changes:	Changes in the number of lectures and tutorials. Learning outcomes were exhaustively presented previously; those have been rewritten in a more cohesive and coherent way.
Confirmation that affected departments have been consulted:	Changes were made in consultations between the School of Engineering and WMG.

Module Summary	
1. Module Code (if known)	ES3E1
2. Module Title	Design Project with Construction Management
3a. Lead department:	School of Engineering
3b. Teaching Split (if known):	100% Engineering
4. Name of module leader	Dr Georgia Kremmyda
5. Level	UG: <input type="checkbox"/> Level 4 (Certificate) <input type="checkbox"/> Level 5 (Intermediate) <input checked="" type="checkbox"/> Level 6 (Honours) PG: <input type="checkbox"/> Level 7 (Masters) <input type="checkbox"/> Level 8 (Doctoral) See Guidance Notes for relationship to years of study
6. Credit value(s) (CATS)	30
7. Principal Module Aims	To provide experience of performing a project on an individual basis (projects will be specified to groups and involve group interaction without influencing an individual character). To provide students with the opportunity to apply and demonstrate their capabilities (engineering knowledge, initiative, self-motivation,

Module Summary	
	enthusiasm) to plan, carry out and control an open-ended design project in civil engineering. To provide students with the opportunity of enhancing 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. To provide students with simulated experience of working as professional engineers in an industrial organisation.
8. Principal Learning Outcomes	<p>The learning outcomes of the module are designed to meet the requirements of the Joint Board of Moderators (JBM).</p> <p>At the end of the module, the student should be able to:</p> <ul style="list-style-type: none"> • Demonstrate ability to deliver a design that conforms to a detailed specification and in accordance with standards and regulations. • 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. • Demonstrate critical awareness of building information modelling (BIM) and its use for management and life-cycle assessment of construction projects. • Define sustainability and evaluate the sustainability merits in broader environmental, societal, and economical terms and its relation to design, construction and maintenance of structures. • Identify and interpret forms of contract and documents associated with a typical construction project. • Suggest a practical method of construction. • Show knowledge of site organization procedures and site waste management plans. • Demonstrate ability to apply health and safety in design and construction. • Demonstrate communication skills: writing interim and final reports; and giving an oral presentation.
9. Timetabled Teaching Activities (summary)	28 hours of Lectures and 19 hours of tutorials Total 47 hrs.
10. Departmental Web-link	http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year3
11. Other essential notes	The module will be delivered in Terms 1 and 2. Advice and feedback hours are available for answering questions on the lecture material (theory and examples).

Module Summary	
12. Assessment methods (summary)	Interim report 25 pages (20%) Final report 50 pages (50%) Individual Oral Presentation (10%) Logbook (10%) Unseen written test (10%)

For use by Strategic Planning and Analytics Office only - Do not fill in this section

Level	JACS3 Code	Teaching Split
		<i>If not provided in 3b above</i>

External Credit Level		Scheme	

Module Context				
13. Please list all departments involved in the teaching of this module. If taught by more than one department, please indicate percentage split.				
School of Engineering				
14. Availability of module				
Degree Code 16-17 last entry	Title	Study Year	C/OC/ A/B/C	Credits
H106	BEng Engineering	3	OC	30
New	BEng Engineering with Intercalated Year	4	OC	30
H210	BEng Civil Engineering	3	C	30
New	BEng Civil Engineering with Intercalated Year	4	C	30
Degree Code 17-18 onwards	Title	Study Year	C/OC/ A/B/C	Credits
H113	BEng Engineering	3	OC	30
H111	BEng Engineering with Intercalated Year	4	OC	30
H216	BEng Civil Engineering	3	C	30
H215	BEng Civil Engineering with Intercalated Year	4	C	30
15. Minimum number of registered students required for module to run				
1 (core module)				
16. Pre- and Post-Requisite Modules				
Pre: ES3D3 Civil Engineering Materials & Structural Analysis				

Module Content and Teaching	
17. Teaching and Learning Activities (<i>totals for module – please see guidance</i>)	
Module duration (weeks)	22 (Term 1 and 2)
Lectures	28x1 hours
Seminars	
Tutorials	19x1 hours
Project Supervision	
Demonstration	
Practical Class/Workshops	
Supervised time in studio/workshop	
Fieldwork	
External visits	

Module Content and Teaching	
Work based learning	
Placement	
Year abroad	
Other activity <i>(please describe): e.g. distance-learning, intensive weekend teaching etc.</i>	253 hours of guided independent learning

18. Assessment Method (Standard)		
Type of assessment	Length	% weighting
Written Examinations		
Practical Examinations		
Assessed essays/coursework	Logbook Interim report (25 pages) Final report (50 pages) Individual Oral presentation Unseen written test	10% 20% 50% 10% 10%
18a. Final chronological assessment <i>(please see guidance)</i>	Individual Oral Presentation	

19. Methods for providing feedback on assessment.
Detailed marking and feedback on assignments (interim report, final report, logbook, oral presentation). Verbal feedback during tutorials.
20. Outline Syllabus
Definition of a realistic project (e.g. bridge, skyscraper, airport) 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. Use of standard form of contract documents for the construction project. Conceptual design and use of sketches prepared to scale to describe a solution for the structural system and how loads are transferred to foundations. Methods of construction (on-site/off-site), use of cranes and their capacities, need for lifting, and access to construction site. Describe the construction site organization as well as robust waste management plan. Definition of a set of measures for control of risks and hazards. Choice of structural materials, preliminary design of structural members, and 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. Building Information Modeling (BIM), teams and collaboration, transfer of information from design to construction, BIM for life-cycle management of construction projects. Sustainability in construction, green economy, and assessment of design solution using a set of criteria of the low-carbon agenda.

21. Illustrative Bibliography

- C. Arya. Design of structural elements. Taylor and Francis, 2005. QC 137.A7
 M.Y.H. Bangash. Structural details in concrete, Blackwell, 1992. QC 137.4.B2
 K.S. Elliott. Multi-storey precast concrete framed structures, 1996. QC 137.4.E5
 E.H. Gaylord et al. International Structural Engineering Handbook, 4th ed., McGraw-Hill, 1997, QC137.S8
 I.A. MacLeod. Modern Structural Analysis. T. Telford, 2005. QC 137.M2
 M. Millais. Building structures: from concepts to design. 2nd Ed. Taylor and Francis, 2005. TH 854.M4
 M.J. Ryall et al. (Eds). Manual of Bridge Engineering. 2000. TG 300.M2
 Standard Method of Detailing Structural Concrete, 3rd ed. (3-day loan), Institution of Structural Engineers, 2006. QC 137.4 S8
 BS EN 1990: 2002. Basis of Design
 BS EN 1991-1-1: 2002. Actions on Structures (General Actions; Imposed Loads for Buildings)
 BS EN 1992-1-1: 2004. Design of Concrete Structures
 BS EN 1993-1-1: 2005. Design of Steel Structures
 BS EN 1994-1-1: 2006. Design of Composite Structures of Steel and Concrete
 BS 5400: Steel, Concrete and Composite Bridges:
 -- Part 2: 1978. Specification for Loads.
 -- Part 3: 1982. Code of Practice for Design of Steel Bridges.
 -- Part 4: 1990. Code of Practice for Design of Concrete Bridges.
 BS 8110: Part 1, Structural use of concrete, 1985. (In SRC; ask at the Help Desk)
 BS 1192: Construction Drawing Practice: - Part 1: 1984. Recommendations for General Principles
 Harris F., Ronald McCaffer, Francis Edum-Fotwe. Modern Construction Management, Wiley Blackwell, 7th ed. ISBN-10: 047067217X. 2013. ISBN-13: 978-0470672174
 Powell, G. Construction Contract Preparation and Management: From Concept to Completion. UK: Palgrave Macmillan. 2012. ISBN-10: 0230273793, ISBN-13: 978-0230273795
 Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston. BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors. 2nd Edition. 2011. ISBN: 978-0-470-54137-1
 March, C. Operations Management for Construction, Taylor & Francis. 2009. ISBN-10: 0415371139, ISBN-13: 978-0415371131

22. Learning outcomes

Successful completion of the module leads to the learning outcomes. The learning outcomes identify the knowledge, skills and attributes developed by the module.

Learning Outcomes should be presented in the format "By the end of the module students should be able to..." using the table at the end of the module approval form:

Resources	
23. List any additional requirements and indicate the outcome of any discussions about these.	

Approval	
24. Module leader's signature	Dr Georgia Kremmyda
25. Date of approval	21 March 2018
26. Name of Approving Committee (include minute reference if applicable)	School of Engineering and WMG Course and Module Approval Committee (CMAC) Minute 199-17/18
27. Chair of Committee's signature	Professor Gillian Cooke
28. Head of Department(s) signature	Professor David Towers

Examination Information		
A1. Name of examiner (if different from module leader)		
A2. Indicate all available methods of assessment in the table below		
% Examined	% Assessed by other methods	Length of examination paper
	Logbook 10% Interim report (25 pages) 20% Final report (50 pages) 50% Individual Oral presentation 10% Unseen written test 10%	
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
No		
A4. How many papers will the module be examined by?	<input type="checkbox"/> 1 paper <input type="checkbox"/> 2 papers	
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	N/A	
A6. Is reading time required?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
A7. Please specify any special exam timetable arrangements.		
N/A		
A8. Stationery requirements		
No. of Answer books?	N/A	
Graph paper?	N/A	
Calculator?	N/A	
Any other special stationery requirements (e.g. Data books, tables etc)?	N/A	
A9. Type of examination paper		
Seen?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Examination Information	
Open Book?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Restricted?	<input type="checkbox"/> Yes <input type="checkbox"/> No
If restricted, please provide a list of permitted texts:	N/A

LEARNING OUTCOMES		
(By the end of the module the student should be able to....) Note: The learning outcomes of the module are designed to meet the JBM requirements.	Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 15)	Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 16)
Demonstrate ability to deliver a design that conforms to a detailed specification and in accordance with standards and regulations.	Lectures, Tutorials	Logbook, Interim Report, Final Report
Critically assess structural materials (e.g. concrete, steel) and their mechanical properties (e.g. strength) for the structural members of a structure.	Lectures, Tutorials	Interim report, Final report
Make reasonable initial estimations for the geometry, dimensions, and cross-section size of structural elements (e.g. beams, columns, foundations, etc.).	Lectures, Tutorials	Interim Report
Synthesize design calculations and engineering drawings.	Lectures, Tutorials	Final report
Demonstrate critical awareness of building information modelling (BIM) and its use for management and life-cycle assessment of construction projects.	Lectures, Tutorials	Unseen written test
Define sustainability and evaluate the sustainability merits in broader environmental, societal, and economical terms and its relation to design, construction and maintenance of structures.	Lectures, Tutorials	Final report, Unseen written test
Identify and interpret forms of contract and documents associated with a typical construction project.	Lectures, Tutorials	Unseen written test
Suggest a practical method of construction.	Lectures, Tutorials	Final report
Show knowledge of site organization procedures and site waste management plans.	Lectures, Tutorials	Final report, Unseen written test
Demonstrate ability to apply health and safety in design and construction.	Lectures, Tutorials	Logbook, Interim Report, Report, Unseen written test
Demonstrate communication skills: keeping a logbook, writing interim and final reports; and giving an oral presentation.	Lectures, Tutorials	Logbook, Interim Report, Report, Oral presentation