UNIVERSITY OF WARWICK

Approval information	
Approval Type	☒ Revised module
Date of Introduction/Change	October 2018
If new, does this module replace another? If so, enter module code and title:	N/A
If revised/discontinued, please outline the rationale for the changes:	Update to resources, lecture activities and assessment methods
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)	ES410
2. Module Title	Group Project
3a. Lead department:	School of Engineering
3b. Teaching Split (if known):	School of Engineering 75% : WMG 25% nominal split
4. Name of module leader	Dr. Gary Fowmes
5. Level	UG: ☐ Level 4 (Certificate) ☐ Level 5 (Intermediate) ☐ Level 6 (Honours) PG: ☒ Level 7 (Masters) ☐ Level 8 (Doctoral) See Guidance Notes for relationship to years of study
6. Credit value(s) (CATS)	30
7. Principal Module Aims	The group projects aim to give students experience of working within a team, and parallels the way engineers often work in industry. Students will integrate their knowledge and understanding in order to specify and solve a substantial engineering problem (or user need), through the creation and development of a product, process or system. The project also allows students to develop their understanding of project

Module Summary	
	management, time management, ethics, sustainability, health and safety, risk and intellectual property rights. Students will develop effective communication and leadership skills.
8. Principal Learning Outcomes	Whilst no two projects will be the same all will test students in the same way, such that by the end of the module a student should be able to: • Extrapolate existing knowledge and experience and apply them in an integrated systems approach to solve a complex and unfamiliar engineering problem. • Extract and critically evaluate relevant data in order to apply engineering analysis and advanced problem solving skills, in order to complete an engineering project to the satisfaction of a customer and/or user. • Use innovative techniques, materials or methods in delivering the project. • Consider the wider context of the project including, risk, health and safety, ethics, environmental and sustainability limitations, intellectual property rights, codes of practice and standards, product safety and liability, to inform the project specification (problem brief) as relevant to the project. • Plan and manage a project from the design process to a deliverable outcome, including managing a budget and costs, and understanding the commercial, economic and social environment of the project • Demonstrate effective communication, both verbal and written, to a technical and non-technical audience. • Demonstrate the ability to work as a member of a team to achieve shared objectives within the scope of the project and monitor and adjust a personal programme of work on an on-going basis.
9. Timetabled Teaching Activities (summary)	5 hours of Lectures. 25 hours of support from staff Project Director arranged at a mutually convenient time with the students. Meeting at convenient times throughout the normal working week. These slots are not timetabled and should not occur after 13:00 on a Wednesday. **Total 30 hours**
10. Departmental Web-link	https://moodle.warwick.ac.uk/course/view.php?id=21935
11. Other essential notes	Please refer to https://moodle.warwick.ac.uk/course/view.php?id=21935

Module Summary	
12. Assessment methods (summary)	70% - Group portfolio: containing a range of professional and engineering documents submitted at stages throughout the project 15% - Group presentation 15% - based on individual contribution, evaluated via peer assessment and statement of contribution, and agreed by the project director. **N.B. All submission weeks indicated relate to nominal academic calendar. Exact week number might vary due to timing of holidays, etc. Submission week numbers will be clearly stated at the inception of the project.**

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

Level	JACS3 Code	Teaching Split
		If not provided in 3b above

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 75% : WMG 25% nominal split

14. Availability of module

Degree Code	Title	Study Year	C/OC/ A/B/C	Credits
H331	MEng Automotive Engineering	4	C	30
New	MEng Automotive Engineering with Exchange Year	4		
H333	MEng Automotive Engineering with a Year in Research	5		
H33A	MEng Automotive Engineering with Business Management	4		
H332	MEng Automotive Engineering with Intercalated Year	5		
H33C	MEng Automotive Engineering with Robotics	4		
H33B	MEng Automotive Engineering with Sustainability	4		
H211	MEng Civil Engineering	4		
H21A	MEng Civil Engineering with Exchange Year	4		
H213	MEng Civil Engineering with a Year in Research	5		
H20A	MEng Civil Engineering with Business Management	4		
H212	MEng Civil Engineering with Intercalated Year	5		
H20B	MEng Civil Engineering with Sustainability	4		
H635	MEng Electronic Engineering	4		
H64Z	MEng Electronic Engineering with Exchange Year	4		
H60C	MEng Electronic Engineering with Business Management	4		
H60D	MEng Electronic Engineering with Communications	4		
H636	MEng Electronic Engineering with Intercalated Year	5		
H637	MEng Electronic Engineering with a Year in Research	5		
H107	MEng Engineering	4		
New	MEng Engineering with Exchange Year	4		
H110	MEng Engineering with a Year in Research	5		
H10C	MEng Engineering with Business Management	4		
H10G	MEng Engineering with Communications	4		
H10M	MEng Engineering with Fluid Dynamics	4		
H109	MEng Engineering with Intercalated Year	5		
H10K	MEng Engineering with Robotics	4		
H10D	MEng Engineering with Sustainability	4		
HH37	MEng Manufacturing and Mechanical Engineering	4		

Module Context				
HH79	MEng Manufacturing and Mechanical Engineering with Exchange Year	4		
HH39	MEng Manufacturing and Mechanical Engineering with a Year in Research	5		
H37A	MEng Manufacturing and Mechanical Engineering with Business Management	4		
HH38	MEng Manufacturing and Mechanical Engineering with Intercalated Year	5		
H37D	MEng Manufacturing and Mechanical Engineering with Robotics	4		
H37B	MEng Manufacturing and Mechanical Engineering with Sustainability	4		
H311	MEng Mechanical Engineering	4		
H320	MEng Mechanical Engineering with Exchange Year	4		
H313	MEng Mechanical Engineering with a Year in Research	5		
H30G	MEng Mechanical Engineering with Business Management	4		
H30P	MEng Mechanical Engineering with Fluid Dynamics	4		
H312	MEng Mechanical Engineering with Intercalated Year	5		
H30H	MEng Mechanical Engineering with Sustainability	4		
HH63	MEng Systems Engineering	4		
New	MEng Systems Engineering with Exchange Year	4		
HH65	MEng Systems Engineering with a Year in Research	5		
H63A	MEng Systems Engineering with Business Management	4		
HH64	MEng Systems Engineering with Intercalated Year	5		
H63B	MEng Systems Engineering with Sustainability	4		

15. Minimum number of registered students required for module to run
N/A (Core Module)
16. Pre- and Post-Requisite Modules
N/A (Core for all students following a MEng course within the School of Engineering)

Module Content and Teaching	
17. Teaching and Learning Activities *(totals for module – please see guidance)*	
Module duration (weeks)	25
Lectures	5
Seminars	N/A

Module Content and Teaching	
Tutorials	N/A
Project Supervision	25 hours
Demonstration	N/A
Practical Class/Workshops	N/A *N.B.* Students are expected to undertake workshop work as required; note this is not a formally taught activity.
Supervised time in studio/workshop	N/A
Fieldwork	N/A
External visits	N/A
Work based learning	N/A
Placement	N/A
Year abroad	N/A
Other activity *(please describe): e.g. distance-learning, intensive weekend teaching etc.*	Students are expected to contribute a total of 270 hours to the project in addition to the 25 hours project supervision and 5 hours of supporting Lectures leading to a total of 300 hours work per student.

18. Assessment Method (Standard)		
Type of assessment	**Length**	**% weighting**
Written Examinations	N/A	N/A
Practical Examinations	N/A	N/A
Assessed essays/coursework	- Group Portfolio: containing a range of professional and engineering documents submitted at stages throughout the project - Group presentation - Peer assessment and statement of contribution.	70% 15% 15%
18a. Final chronological assessment *(please see guidance*)	Peer assessment and statement of contribution.	

19. Methods for providing feedback on assessment.
Verbal feedback during group meetings with Project Director, milestone report feedback and feedback on the formal presentation Written feedback on poster, design report, cost benefit report and presentation
20. Outline Syllabus

Module Content and Teaching

Projects will vary in nature. Many will be 'design and make' type projects. In this case small unit manufacture of prototype solutions may be possible and if required will be specified as part of the project briefing. Other projects will be more focussed on design and proof of concept stage, and might include no realization of the design in a physical form. Examples of this are likely in Civil Engineering projects where the logistical implications of large scale build are not manageable in terms of project costs, manpower, or timescales. Yet more projects may be evaluation exercises using proprietary software. Others may be restoration or re-commissioning projects, whilst others will be design evolutions of high-technology / high-complexity systems such as race-cars.

In each case the project will normally involve groups of 6 students from a cross section of degree streams. Tasks will be predetermined by the School of Engineering / WMG staff Project Director each year to match the skills and mix of the students. Where possible projects will ideally have industrial backing or at least be able to demonstrate industrial applicability

Depending on the product selected, consideration will be given to design concept, mechanical and/or structural design, materials selection, stress analysis, dynamic performance, electrical/electronic design, control theory, actuator selection, sensors, computer interfacing, signal processing, control software, process planning, facilities planning, process design and development, production economics, customer needs, scheduling, quality control, materials control, tooling requirements, sales and marketing, management structure, programming, manufacturing, procurement, financial planning and management, promotion of the work to a wider public audience or whatever the most suitable vehicle is to measure the stated learning outcome in terms of measuring students' ability to develop their engineering skills and competencies.

Students will be encouraged assume the positions of design engineers, development engineers, production engineers, test engineers, project managers, etc. in the delivery of the project. Each student will have an agreed responsibility within their own specialisation, but will have to interact with other disciplines and hence appreciate the complexities of complete systems from both the technical and organisational point of view. This will develop the engineer's ability to think and communicate in terms of integrated systems.

A member of staff is appointed as Project Director, will provide guidance on technical and organisational matters. Usually a student member of the group will be appointed as the Project Manager. Regular meetings take place with formal minutes to provide a record of decisions. The project be communicated via an academic poster, testing the students' ability to rapidly communicate complicated ideas, systems, or processes. Furthermore it will require a formal write-up describing it's delivery in detail, and a reasoned financial cost-benefit analysis. An oral presentation will takes place at the start of term 3 where the whole team will describe the project to an academic audience and answer question on its delivery.

21. Illustrative Bibliography

As dictated by the subject of the project.

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.

Module Content and Teaching
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.
N/A

Approval	
24. Module leader's signature	Dr Gary Fowmes
25. Date of approval	Chair's Action 2 May 2018
26. Name of Approving Committee (include minute reference if applicable)	School of Engineering and WMG Course and Module Approval Committee.
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)	N/A	
A2. Indicate all available methods of assessment in the table below		
% Examined	**% Assessed by other methods**	**Length of examination paper**
N/A	**70%** - Group portfolio: containing a range of professional and engineering documents submitted at stages throughout the project **15%** - Group presentation **15%** - based on individual contribution, evaluated via peer assessment and statement of contribution, and agreed by the project director.	N/A
A3. Will this module be examined together with any other module (sectioned paper)? If so, please give details below.		
A4. How many papers will the module be examined by?	N/A	
A5. When would you wish the exam take place (e.g. Jan, April, Summer)?	N/A	
A6. Is reading time required?	N/A	
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	

Examination Information	
A9. Type of examination paper	
Seen?	N/A
Open Book?	N/A
Restricted?	N/A
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....)	**Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 17)**	**Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 18)**
Extrapolate existing knowledge and experience and apply them in an integrated systems approach to solve a complex and unfamiliar engineering problem.	Regular meetings/consultations with Project Director(s) and team members. Self-guided study.	Formal reports and oral presentations.
Extract and critically evaluate relevant data in order to apply engineering analysis and advanced problem solving skills, in order to complete an engineering project to the satisfaction of a customer and/or user.	Regular meetings/consultations with Project Director(s) and team members. Self-guided study.	Formal reports, poster and oral presentations.
Consider the wider context of the project including, risk, ethics, environmental and sustainability limitations, intellectual property rights, codes of practice and standards, product safety and liability, to inform the project specification (problem brief) as relevant to the project.	Regular meetings/consultations with Project Director(s) and team members. Self-guided study.	Formal reports and minutes of meetings; poster and oral presentations.
Plan and manage a project from the design process to a deliverable outcome, including managing a budget and costs, and understanding the commercial, economic and social environment of the project	Regular meetings/consultations with Project Director(s) and team members. Self-guided study.	Formal reports and oral presentations.
Demonstrate effective communication, both verbal and written, to a technical and non-technical audience.	Regular meetings/consultations with Project Director(s) and team members	Formal reports and minutes of meetings; poster and oral presentations. Peer Assessment exercise.

LEARNING OUTCOMES		
(By the end of the module the student should be able to....)	**Which teaching and learning methods enable students to achieve this learning outcome? (reference activities in section 17)**	**Which summative assessment method(s) will measure the achievement of this learning outcome? (reference activities in section 18)**
Demonstrate the ability to work as a member of a multidisciplinary team to achieve shared objectives within the scope of the project.	Regular meetings/consultations with Project Director(s) and team members, self-organisation and reflection. Formal presentations and submissions.	Formal reports, poster and oral presentations.
Use innovative techniques, materials or methods in delivering the project.	Regular meetings/consultations with Project Director(s) and team members. Self-guided study.	Formal reports, poster and oral presentations.