UNIVERSITY OF LEICESTER

Programme Specification (Undergraduate)

2019/20 Entry. Date amended: May 2018

1. Programme Title and UCAS code:

BEng in Mech Eng H300

2. Awarding body or institution:

University of Leicester

3. a) Mode of study:

Full time

b) Type of study:

Campus-style based in Panjin Campus, DUT

4. Registration periods

The normal period of registration is four years

The maximum period of registration is six years

5. Typical entry requirements:

All students that have followed the Chinese school and qualification system must be from the same Gaokao group (the top group out of four) as students entering other DUT undergraduate programmes. Students must also possess a sufficient level of English language to enable such students to undertake studies with the English language as the teaching medium;

For Year 1 entry, a Gaokao English language score of 70% for English language or an IELTS score of 5.0 will be required. After intensive English language teaching in Year 1, students will be required to demonstrate CEFR Level B2 in English language (otherwise IELTS 6.0).

6. Accreditation of Prior Learning:

APL will not be accepted for exemptions from individual modules, however may be considered for direct entry to year 2, on a case by case and subject to the general provisions of the University APL policy.

7. Programme aims:

The programme aims to

- provide students with direct experience of a Leicester-style degree programme
- enhance and develop the students' English language skills
- provide a curriculum that is enjoyable and motivating and which creates enthusiasm for engineering through the challenge of responding to interesting engineering problems;
- provide students with the breadth of understanding in electrical and electronic as well as mechanical engineering obtainable through working in a general engineering environment;
- develop students' knowledge and understanding of the tools and techniques used for modelling, analysis, design and control of complex engineering systems;
- develop students' detailed knowledge and understanding of engineering applications used in research and industry;
- cultivate the synergy between teaching and research;
- maintain quality in all aspects of the teaching and learning environment, presenting materials in a manner most appropriate to the learning goals, to students' preferred learning styles as well as to subject matter; and

- foster students' independent learning and organisational skills.enhance written and oral communication skills

8. Reference points used to inform the programme specification:

- QAA Benchmarking Statement for Engineering (2010)
- University of Leicester Learning and Teaching Strategy 2011-2016
- University of Leicester Periodic Developmental Review Report (May 2015)
- External Examiners' reports (annual)
- Industrial Consultative Committee
- UK-SPEC (UK Standard for Professional Engineering Competence)
- EAB accreditation [http://www.engc.org.uk/education-skills/course-search/acad/] (last accreditation in 2014)

9. Programme Outcomes:

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(a) Discipline specific knowledge and competencies		
(i) Mastery of an appropriate body of knowledge		
Demonstrate knowledge of the principles of general engineering.	Lectures, tutorials, seminars, laboratory practicals, directed reading, independent research, resource-based learning.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
(ii) Understanding and application of key concepts and techniques		
Demonstrate knowledge, understanding and application of appropriate mathematical, computational and scientific techniques and methods for modelling and analysing engineering problems.	Lectures, tutorials, surgeries problem solving classes, computer practical classes, example sheets.	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent projects.
Demonstrate knowledge and understanding of the design process and design methodologies used in the discipline.	Lectures, tutorials, surgeries problem solving classes, independent research, project supervision.	As above
Demonstrate knowledge and understanding of management and business practices that influence an engineer's work.	Lectures, tutorials, independent research, project supervision.	As above
Demonstrate knowledge and understanding of manufacturing and/or operational practice.	Lectures, tutorials, independent research, project supervision.	As above
(iii) Critical analysis of key issues		
Apply scientific principles to model and analyse engineering systems, processes and products. Analyse systems, processes or components as part of the design process.	Lectures, tutorials, surgeries problem solving classes computer practical classes, example sheets. As above	Examinations, laboratory reports, seminar presentations, contributions to discussions, problem-based exercises, design tasks, simulation exercises, group projects, independent

Evaluate commercial risks and technical risks in unfamiliar circumstances.	Problem solving exercises, independent research projects, group projects.	projects.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(iv) Clear and concise presentation of material		
Interpret and report results, presenting data in alternative forms suitable for a range of different audiences in order to create deeper understanding and/or greater impact.	Lectures, seminars, masterclasses.	Written assignments, exhibitions, poster displays, reports, independent research projects.
(v) Critical appraisal of evidence with appropriate insight		
Select and apply appropriate computer-based methods for modelling and analysing engineering problems.	Computer practical classes, lectures, surgeries.	Computer-based exercises, simulation exercises, research projects.
Create and design new processes or products to fulfil a specified requirement through synthesis of ideas from a wide range of sources.	Design tasks, laboratory practicals, simulation exercises, group projects.	Problem solving exercises, simulations, exhibitions, independent research.
Perform practical testing, technical analysis and critical evaluation of design ideas in laboratory or through simulation.	Design tasks, laboratory practicals, simulation exercises, group projects.	Laboratory examinations, laboratory reports, simulation reports.
Take account of industrial and commercial constraints when applying engineering techniques.	Design tasks, laboratory practicals, simulation exercises, group projects,	Written assignments, oral presentations.
(vi) Other discipline specific competencies		
Select and use appropriate test and measurement instrumentation.	Laboratory practicals, group research projects, independent research projects.	Laboratory reports, examinations, projects reports.
Select and conduct appropriate experimental procedures.	Laboratory practicals, design tasks, independent research.	Laboratory reports, examinations, project reports.
Demonstrate knowledge and understanding of manufacturing and/or operational practice.	Lectures, simulation.	Laboratory reports, written assignments.
Apply understanding of codes of practice related to hazards and operational safety to ensure good working practices.	Laboratory practicals, design tasks, independent research.	Laboratory reports, written assignments.
(b) Transferable skills		
(i) Oral communication		
Present technical and business information orally, in an appropriate form for a given audience.	Tutorials, group projects, independent research, project supervision.	Oral presentations, portfolio.
(ii) Written communication		
Communicate business and technical information in an appropriate written form for a given audience.	Lectures, group projects, independent research, project supervision.	Written assignments, laboratory reports, essays, independent projectreports.
Report on a practical or simulation test of a design solution including analysis and discussion of the results.	As above	As above

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(iii) Information technology		
Use of spreadsheets; Basic word processing; Use of Eng Software, e.g. drawing and FEA modelling	Workshops; Lab data analysis Projects; Lab and Project reports	Assessed tasks; Project report Laboratory assessment and projects
(iv) Numeracy		
Manipulate and sort data to generate new data sets. Manipulate and present data in alternative formats to create deeper understanding or greater impact.	Problem-solving classes, research projects. Problem-solving classes, research projects.	Computer-based exercises, written assignments, poster displays, oral presentations.
(v) Team working		
Work collaboratively as part of a team undertaking a range of different team roles.	Tutorials, masterclasses, project supervision, induction programmes.	Learning logs/diaries, learning portfolios, group projects, simulation exercises.
(vi) Problem solving		
Solve problems through the integration of knowledge of mathematics, science, information technology, design, business context and engineering practice. Select & analyse appropriate evidence to solve non-routine problems. Use systematic analysis and design methods to solve problems in unfamiliar situations. Use creativity and innovation to solve problems. Apply standard management techniques to plan and allocate resources to projects.	Project supervision, lectures, tutorials, example sheets, simulation exercises, laboratory based exercises, computer-based exercises, independent research projects, group projects. As above As above A	Individual research projects, oral presentations, project reports, problem-based examinations, practical demonstrations.
(vii) Information handling		
Select and apply scientific evidence based methods in the solution of problems. Search for information related to design solution, evaluate it and suggest requirements for additional information. Work with limited or contradictory information.	Lectures, tutorials, example sheets, simulation exercises, laboratory based exercises, computer-based exercises, independent research projects, group projects. As above	Individual research projects, oral presentations, project reports, problem-based examinations, practical demonstrations.
(viii) Skills for lifelong learning		
Demonstrate knowledge and understanding of the professional and ethical responsibilities of an engineer. Learn independently and understand new concepts in the discipline readily. Develop and implement personal plan of work to meet a deadline. Identify the critical activities within a personal plan of work.	Work placement, simulation exercises, independent research. Independent research projects, group research projects,. Independent research projects, group research projects.	Simulation exercises, reports, independent projects. Independent project report, learning logs/diaries, learning portfolios. Independent project report, learning logs/diaries, learning portfolios

Explore career development opportunities.	Masterclasses, learning portfolios,	Learning portfolios

10. Progression points:

Minimum assessment levels are outlined with each module specification as set out in **Senate Regulation 5.** Additional progression criteria include:-

- Students must pass the English language modules in year 1, which cannot be carried into year 2, in order to be able to demonstrate the ability to learn and study in English.
- In order to ensure sufficient professional ability within engineering laboratories, management and design in line with the programme outcomes and the expectations of the accreditation body (Engineering Accreditation Board) students must pass each of the following modules including EG1006, EG2004 and EG2006 for which there are no opportunities for reassessment. These modules have an additional attendance requirement wherein students may not be absent for more than 25% of the schedule laboratory classes. Additional "catch-up" sessions will be provided for students for whom non-attendance has been mitigated.

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course

Transfer between different degrees: Students not satisfying the UoL progression requirements may be allowed to transfer onto DUT programmes. Students satisfying the UoL progression requirements may be allowed to transfer to the University of Leicester campus-based BSc Chemistry degree programme, subject to capacity and physical resource limitations on the UoL campus.

11. Scheme of Assessment

The programme follows the standard scheme of award and classification set out in Senate Regulation 5.

12. Special features:

Programme delivered entirely in English, UK-style facilities provided on Panjin campus, Small group tutorials via video conferencing, group problem solving, research based projects, problem based learning, Reflect lecture capture.

13. Indications of programme quality

All of the current BEng courses are accredited by the appropriate professional engineering institutions. It is our intention to seek accreditation from the EAB for this BEng Mech Eng programme during the next accreditation review.

14. External Examiners

The details of the External Examiner(s) for this programme and the most recent External Examiners' reports for the in-house BEng Mechanical Engineering programme can be found **here**.

Appendix 1: Programme structure (programme regulations) (overleaf)

Appendix 2: Module specifications

Appendix 3: Skills matrix

APPENDIX 1 Programme structure

BEng Mechanical Engineering

FIRST YEAR MODULES

SEMESTER 1

Core Modules			**Credits**
EL0002	ENGLISH FOR GENERAL ACADEMIC PURPOSES		45
EG0280	ADVANCED MATHEMATICS I		15
		Semester Total	**60**

Additional Non-Credit Bearing Modules

MORAL CULTIVATION AND BASIC LAW

PHYSICAL EDUCATION I

MILITARY THEORY AND TRAINING

SEMESTER 2

Core Modules			**Credits**
EL0005	ENGLISH FOR SPECIFIC ACADEMIC PURPOSES		15
EG0281	ADVANCED MATHEMATICS II		15
EG0282	MECHANICAL ENGINEERING FOUNDATION		15
EG0283	ELECTRONIC AND ELECTRICAL ENGINEERING FOUNDATION		15
		Semester Total	**60**

Additional Non-Credit Bearing Modules

CHINESE MODERN CONTEMPORARY HISTORY AND SITUATION POLICY

PHYSICAL EDUCATION II

DUT GENERAL OPTIONAL MODLE I

SEMESTER 3

Additional Non-Credit Bearing Modules

COLLEGE STUDENT MENTAL HEALTH AND HEALTH EDUCATION

SECOND YEAR MODULES

YEAR LONG

EG1006	ENGINEERING DESIGN AND EXPERIMENTATION	30

SEMESTER 1

Core Modules

EG1201	ELECTRICAL AND ELECTRONIC ENGINEERING		30
EG1280	ENGINEERING MATHEMATICS I		15
		Semester Total	**60**

Additional Non-Credit Bearing Modules

XX1001 PRINCIPLE OF MARXISM AND THEORY OF SOCIALISM

XX0006 ENGINERRING WORKSHOP TRAINING

SEMESTER 2

Core Modules			**Credits**
EG1101	MECHANICAL ENGINEERING		30
EG1281	ENGINEERING MATHEMATICS II		15
		Semester Total	**60**

Additional Non-Credit Bearing Modules

XX1005 DUT GENERAL OPTIONAL MODULE II

SEMESTER 3

Additional Non-Credit Bearing Modules

ON-SITE ENGINEERING VISTING PRACTICE

Student Effort on EG1006 is split approximately 15:15 credits sem1:sem2 to give even loading.

THIRD YEAR MODULES

SEMESTER 1

Core Modules			**Credits**
EG2111	MATERIALS & STRUCTURES		15
EG2302	SYSTEM DYNAMICS AND CONTROL		15
EG2121	MATERIALS PROCESSING		15
EG2112	DYNAMICS & THERMOFLUIDS		15
		Semester Total	**60**

Additional Non-Credit Bearing Modules

DUT GENERAL OPTIONAL MODULE III

SEMESTER 2

Core Modules			**Credits**
EG2004	ENGINEERING EXPERIMENTATION AND ANALYSIS		15
EG2006	INTEGRATED ENGINEERING DESIGN		30
EG2122	APPLIED ENGINEERING THERMODYNAMICS		15
		Semester Total	**60**

Additional Non-Credit Bearing Modules

PROCESS MACHINERY AND EQUIPMENT

PROCESS PRINCIPLE AAND EXPERIMENT I

SEMESTER 3

Additional Non-Credit Bearing Modules

PRODUCTION PRACTICAL

FOURTH YEAR MODULES

SEMESTER 1

Core Modules			**Credits**
EG3124	TRIBOLOGY IN ENGINEERING DESIGN		15
EG3313	STATE VARIABLE CONTROL		15
EG3008	ENGINEERING MANAGEMENT		15
EG3112	HEAT TRANSFER AND ENERGY SYSTEMS		15

Optional Modules

Choose 15 credits from:

EG3111	FINITE ELEMENT ANALYSIS AND DESIGN		15
EG3125	RIGID-BODY & STRUCTURAL DYNAMICS		15
EG3422	AEROSPACE MATERIALS & STRUCTURES		15
		Semester Total	**75**

SEMESTER 2

Core Modules			**Credits**
EG3323	DIGITAL CONTROL & ACTUATORS		15
EG3005	FINAL YEAR PROJECT		30
		Semester Total	**45**

Additional Non-Credit Bearing Modules

CAREER DEVELOPMENT

APPENDIX 2

Module Specification

Date created/amended: 08/03/2017
Last amended by: E G Hope

EL0002 English for General Academic Purposes

Year	2017/18
Level	0
Period	Sem1
Occurrence	P
Spanning Years Y/N?	N
Credits	45
Department	ELTU
Module Coordinator	James Lambert
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	
Seminars	224.00
Tutorials	1.00
Project Supervision	
Demonstration	
Practical Classes and Workshops	
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	225.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	450.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Speaking Test	20			0.3	
Listening Test	20			0.6	
Reading Test	20			1	
Writing Test	20			1	
Project Essay	20				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Demonstrate that they can discuss their ideas orally in English with other students and staff.	Speaking Test, Listening Test
Demonstrate that they can express themselves appropriately in writing	Project Essay, Writing Test
Demonstrate that they can use English language sources in their written and spoken assignments appropriately referenced and without plagiarism.	Project Essay, Writing Test, Listening Test
Demonstrate that they can acquire knowledge gained through research and independent study in English and apply that knowledge.	Reading Test, Writing Test, Project Essay
Demonstrate that they can choose their own aims and work outside class to achieve them.	Project Essay

Teaching and Learning Methods

Methodology

Methods:

Students will be engaged in student centred Communicative Language Teaching classroom practice which will facilitate learning and acquisition of language and language skill competencie

Students will be engaged in activities which will simulate modes of learning and assessment used in their chosen degree such as problem based learning and report writing.

-Individual contributions to open class

-Pair and small group work

-Task Based Learning situations

-Process Writing approach

Learner Training

Students will be engaged in skills and tools that will make them better language learners in and out of clas

-Analysing discourse and recognising valuable features, lexis and structures

-Managing and recording their learning

-Exploring online and paper-based resources to assist their learnin

-Peer evaluation and reflection

Loop input

Activity content will relate to the values and expectations of UK-type university stud, such as critical thinking, plagiarism and independent study.

The Language and Skills syllabus will focus on generic features of academic language, skills and study modes

The Learner Trianing syllabus will offer students opportunities to identify and acquire academic language, skills and other features specific to their chosen field of study.

Guided Independent Study: Indicative Activities

PDP journal
Contribution to online discussions
Completion of online tasks

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: 08/03/2017
Last amended by: E G Hope

UNIVERSITY OF LEICESTER

EL0005 English for Specific Academic Purposes

Year	2017/18
Level	0
Period	Sem2
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	ELTU
Module Coordinator	James Lambert
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	
Seminars	74.00
Tutorials	1.00
Project Supervision	
Demonstration	
Practical Classes and Workshops	
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	75.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Presentation Assessment	30			0.3	
Portfolio of Coursework	50				
Classroom Contribution	20				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Demonstrate that they can discuss techchnical and scientific ideas orally in English with other students and staff.	Classroom Contribution
Demonstrate that they can express themselves appropriately in technical and scientific writing.	Portfolio of Coursework
Demonstrate that they can use English language sources and material from other coursework in their written and spoken assignments appropriately referenced and without plagiarism.	Presentation Assessment; Portfolio of Courseworkt
Demonstrate that they can acquire knowledge gained through research and independent study in English and apply that knowledge.	Presentation Assessment; Portfolio of Course work; Classroom Contribution
Demonstrate that they can choose their own aims and work outside class to achieve them.	Presentation Assessment

Teaching and Learning Methods

Methodology
Methods:
Students will be engaged in student centred Communicative Language Teaching classroom practice which will facilitate learning and acquisition of language and language skill competencie
Students will be engaged in activities which will simulate modes of learning and assessment used in their chosen degree such as problem based learning and report writing.

-Individual contributions to open class
-Pair and small group work
-Task Based Learning situations
-Process Writing approach

Learner Training
Students will be engaged in skills and tools that will make them better language learners in and out of clas
-Analysing discourse and recognising valuable features, lexis and structures
-Managing and recording their learning
-Exploring online and paper-based resources to assist their learnin
-Peer evaluation and reflection

Loop input
Activity content will relate to the values and expectations of UK-type university stud, such as critical thinking, plagiarism and independent study.
The Language and Skills syllabus will focus on generic features of academic language, skills and study modes
The Learner Trianing syllabus will offer students opportunities to identify and acquire academic language, skills and other features specific to their chosen field of study

Guided Independent Study: Indicative Activities

PDP journal
Contribution to online discussions
Completion of online tasks

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: Sep 2017
Last amended by: Jingzhe Pan

UNIVERSITY OF LEICESTER

EG0280 Advanced Mathematics I

Year	**2017/8**
Level	**0**
Period	**Sem1**
Occurrence	**X**
Spanning Years Y/N?	**N**
Credits	**15**
Department	**Engineering**
Module Coordinator	**Prof J Pan**
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	**Undergraduate**
Minimum Assessment Level (UG only)	**Honours Level**

Student Workload	
Lectures	**55.00**
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	**5.00**
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	**90.00**
Placement	
Year Abroad	
TOTAL MODULE HOURS	**150.00**

Assessment Element	Percentage Split	Qualifying Mark*	Alternative Reassessment*	Examination Duration (hrs)	Due Date (DL only)*
Examination (Final)	**100**			**2**	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
After completing this module students should be able to: **• Carry out basic calculations with fractions and decimals** **• Carry out basic algebraic manipulations** **• Solve algebraic equations** **• Use elementary functions, trigonometric functions, exponential and logarithms** **• Differentiate elementary functions using the basic rules of calculus** **• Integrate elementary functions using the basic rules of calculus** **• Find maxima and minima** **• Sketch graphs of simple functions** **• Find areas and volumes of simple geometrical objects**	**Examination**

Teaching and Learning Methods

Lectures, example problems, formative marked work, group problem solving classes & VLE directed activities

Guided Independent Study: Indicative Activities

Directed reading, set problems, group problem solving exercises, formative quizzes

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: Mar 2018
Last amended by: Jingzhe Pan

UNIVERSITY OF LEICESTER

EG0281 Advanced Mathematics II

Year	**2017/8**		**Student Workload**	
Level	**0**		**Lectures**	**60.00**
Period	**Sem2**		**Seminars**	
Occurrence	**P**		**Tutorials**	
Spanning Years Y/N?	N		**Project Supervision**	
Credits	**15**		**Demonstration**	
Department	**Engineering**		**Practical Classes and Workshops**	**4.00**
Module Coordinator	**Ioannis Kyriakopoulos**		**Supervised time in lab/studio/workshop**	
Pre-requisites*			**Fieldwork**	
Co-requisites*			**External Visits**	
Excluded combinations*			**Work Based Learning**	
Module Mark Scheme	**Undergraduate**		**Guided Independent Study**	**86.00**
Minimum Assessment Level (UG only)	**Honours Level**		**Placement**	
			Year Abroad	
			TOTAL MODULE HOURS	**150.00**

Assessment Element	Percentage Split	Qualifying Mark*	Alternative Reassessment*	Examination Duration (hrs)	Due Date (DL only)*
Examination (Final)	**100**			**2**	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
After completing this module students should be able to: **• Carry out advanced algebraic manipulations** **• Use functions and their inverses** **• Use elementary functions, trigonometric functions, exponential and logarithms** **• Differentiate functions involving exponentials and logarithms** **• Differentiate using the product, quotient and chain rules** **• Integrate trigonometric functions** **• Calculate volumes of rotation** **• Manipulate vectors** **• Use the binomial theorem**	**Examination**

Teaching and Learning Methods

Lectures, example problems, formative marked work, group problem solving classes & VLE directed activities

Guided Independent Study: Indicative Activities

Directed reading, set problems, group problem solving exercises, formative quizzes

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: Mar 2018
Last amended by: Jingzhe Pan

UNIVERSITY OF LEICESTER

EG0282 Mechanical Engineering Foundation

Year	**2017/18**	**Student Workload**	
Level	**0**	**Lectures**	**60.00**
Period	**Sem2**	**Seminars**	
Occurrence	**P**	**Tutorials**	
Spanning Years Y/N?	N	**Project Supervision**	
Credits	**15**	**Demonstration**	
Department	**Engineering**	**Practical Classes and Workshops**	**14.00**
Module Coordinator	**Ioannis Kyriakopoulos**	**Supervised time in lab/studio/workshop**	
Pre-requisites*		**Fieldwork**	
Co-requisites*		**External Visits**	
Excluded combinations*		**Work Based Learning**	
Module Mark Scheme	Undergraduate	**Guided Independent Study**	**76.00**
Minimum Assessment Level (UG only)	**Honours Level**	**Placement**	
		Year Abroad	
		TOTAL MODULE HOURS	**150.00**

Assessment Element	Percentage Split	Qualifying Mark*	Alternative Reassessment*	Examination Duration (hrs)	Due Date (DL only)*
Coursework	**30**				
PBL project	**15**				
Examination	**55**			**2**	
Resit Examination	**100**		**Yes**	**2**	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
After completing this module students should be able to: • Describe the nuclear, atomic, chemical and elastic properties of materials. • Explain properties of solids, liquids and gases. • Describe the motion of particles and bodies subject to forces. • Model and solve simple problems involving Newton's laws of motion. • Describe various forms of energy. • Explain the behavior of a system subject to conservation of energy.	**Coursework, PBL project, Examination**

Teaching and Learning Methods

Lectures, example problems, formative marked work, group problem solving classes.

Guided Independent Study: Indicative Activities

Directed reading, set problems, group problem solving exercises, formative quizzes

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: Mar 2018
Last amended by: Jingzhe Pan

UNIVERSITY OF LEICESTER

EG0283 Electrical and Electronic Engineering Foundation

Year	**2017/8**	**Student Workload**	
Level	**0**	**Lectures**	**36.00**
Period	**Sem2**	**Seminars**	
Occurrence	**P**	**Tutorials**	
Spanning Years Y/N?	N	**Project Supervision**	
Credits	**15**	**Demonstration**	
Department	**Engineering**	**Practical Classes and Workshops**	**12.00**
Module Coordinator	**Ioannis Kyriakopoulos**	**Supervised time in lab/studio/workshop**	
Pre-requisites*		**Fieldwork**	
Co-requisites*		**External Visits**	
Excluded combinations*		**Work Based Learning**	
Module Mark Scheme	**Undergraduate**	**Guided Independent Study**	**102.00**
Minimum Assessment Level (UG only)	**Honours Level**	**Placement**	
		Year Abroad	
		TOTAL MODULE HOURS	**150.00**

Assessment Element	Percentage Split	Qualifying Mark*	Alternative Reassessment*	Examination Duration (hrs)	Due Date (DL only)*
Coursework	**30**				
PBL project	**15**				
Examination	**55**			**2**	
Resit Examination	**100**		**Yes**	**2**	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
After completing this module students should be able to: • Describe the electromagnetic spectrum and basic quantum mechanical concepts • Explain the behaviour a particle subject to the influence of magnetic and electric fields • Discuss and apply the Kirchov's laws to electric circuits. • Model and solve simple problems involving Coulomb's law	**Coursework, PBL project, Examination**

Teaching and Learning Methods

Lectures, example problems, formative marked work, group problem solving classes.

Guided Independent Study: Indicative Activities

Directed reading, set problems, group problem solving exercises, formative quizzes

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG1006 Engineering Design and Experimentation

Year	2018/19
Level	1
Period	Year Long
Occurrence	P
Spanning Years Y/N?	N
Credits	30
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours Level

Student Workload	
Lectures	15.00
Seminars	4.00
Tutorials	6.00
Project Supervision	
Demonstration	4.00
Practical Classes and Workshops	148.00
Supervised time in lab/studio/workshop	23.00
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	100.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	300.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Design assignment programme	45				
Attendance at manufacture demonstration (final)	5				
Laboratory logbook	30				
Laboratory formal report 1	10				
Laboratory formal report 2	10				
Re-assessment assignment	100		Yes		

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Describe different stages of engineering design process and their inter-dependencies and apply appropriate techniques and tools used in product design and development, e.g. market survey, prioritised requirement list, objective tree, functional problem decomposition, specification list, evaluation of concept designs.	Design assignments consisting of group and individual assingments on design process and CAD activities.
Design practical solutions to engineering problems and use Computer Aided Design to convey information about mechanical and electrical components and circuits to applicable International Standards based on awareness of basic manufacture techniques	Design assignments Attendance at manufacturing demonstrations
Conduct mechanical and electrical experiments and basic	Laboratory logbook

computational modelling investigations relevant to engineering, including accurate record keeping and logbook use, estimation of error and uncertainty and demonstration of basic coding skills.	
Write technical reports of experimental and/or computational investigations, presenting data to professional standards and comparing experiment and theory.	Formal laboratory reports
Demonstrate professional transferrable skills in a practical engineering context and engage with personal and professional development activities.	Completion of formal assessment elements above

Teaching and Learning Methods

Lectures, supervised laboratory and design workshops, Matlab computation classes, Manufacture demonstration (mechanical, electrical and systems), tutorials, induction and career development workshops.

Guided Independent Study: Indicative Activities

Directed laboratory pre-reading and supporting materials, set problems, group problem based learning, formative quizzes, preparation of formal reports, careers-based reflective task. Online Matlab study.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG1201 Electrical and Electronic Engineering

Year	2018/19
Level	1
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	30
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	82.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	22.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	196.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	300.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination	80	40		3	
VLE assignment 1	10				
VLE assignment 2	10				
Examination	100		Yes	3	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Describe and explain the basic principles underlying Electronic and Electrical Engineering encompassing Electromagnetism, Electrical Circuits, Analogue and Digital Electronics and Radio Communications.	VLE assignment and examination.
Demonstrate an analytical knowledge of the different types of problem encountered in the field of Electrical and Electronic Engineering and an ability to identify the theory required to solve them.	VLE assignment and examination.
Apply basic EM theory that determines the operational characteristics of electromagnetic devices.	VLE assignment and examination.
Interpret data and perform a wide range of simple calculations across	VLE assignment and examination.

the fields of Electromagnetism, Electrical Circuits, Analogue and Digital Electronics and Digital Communications	

Teaching and Learning Methods

Lectures, examples workshops, examples sheets.

Guided Independent Study: Indicative Activities

Directed reading, example problems. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG1280 Engineering Mathematics I

Year	2018/19
Level	1
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	48.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	24.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	78.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	80			2	
VLE assignment	20				
Examination	100		Yes	2	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Demonstrate the basic principles related to functions of many variables, including partial differentiation, vector calculus, and vector integrals.	VLE assignment and examination.
Solve problems involving linear algebra concepts such as vectors, matrices, linear independence, solution of linear systems, eigenvalues and eigenvectors	VLE assignment and examination.
Solve simple PDEs using numerical methods in their solution	VLE assignment and examination.

Teaching and Learning Methods

Lectures, example classes, VLE self-assessment coursework, intensive maths workshops

Guided Independent Study: Indicative Activities

Directed reading, example problems. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: Feb 2017

Last amended by: Jingzhe Pan

EG1101 Mechanical Engineering

Year	2018/19
Level	1
Period	Sem2
Occurrence	P
Spanning Years Y/N?	N
Credits	30
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	82.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	22.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	196.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	300.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination	80	40		3	
VLE assignment 1	10				
VLE assignment 2	10				
Examination	100		Yes	3	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Articulate an understanding of the basic principles of solid mechanics, fluid statics and dynamics and thermodynamics underlying Mechanical and Aerospace Engineering	VLE assignments and exam
Demonstrate an analytical understanding of the different types of problem encountered in Mechanical Engineering and an ability to identify and apply the theory required to solve them	VLE assignments and exam
Interpret data and perform fundamental design calculations across the fields of material properties, structural mechanics, fluid mechanics, thermodynamics and heat transfer.	VLE assignments and exam

Teaching and Learning Methods

Lectures, example classes

Guided Independent Study: Indicative Activities

Directed reading, example problems. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG1281 Engineering Mathematics II

Year	2018/19
Level	1
Period	**Sem2**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	48.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	24.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	78.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	80			2	
VLE assignment	20				
Examination	100		Yes	2	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Solve problems involving linear algebra concepts such as eigenvalues and eigenvectors.	VLE assignment and examination.
Demonstrate the basic principles related to probability theory, mathematical statistics and data analysis	VLE assignment and examination.
Solve problems involving statistics concepts such as sampling, estimation of parameters and hypotheses testing.	VLE assignment and examination.

Teaching and Learning Methods

Lectures, example problems, formative marked work, group problem solving classes & VLE directed activities

Guided Independent Study: Indicative Activities

Directed reading, example problems. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2111 Materials and Structures

Year	2019/20
Level	2
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Define the mechanical material properties that are used in the analysis, modelling and design of static mechanical systems and compare different groups of engineering materials on the basis of these properies.	Examination, Coursework.
Explain the strengthening mechanisms relevant to materials used in advanced mechanical and aerospace structures.	Examination, Coursework.
Derive performance metrics to enable the selection of appropriate materials for a variety of different engineering applications.	Examination, Coursework.
Analyse the loading on a selection of typical engineering structural elements (including pressure vessels) using common failure criteria to determine their strength in yield, brittle fracture and buckling.	Examination, Coursework
Apply stress intensity methods to the solution of fracture problems; fatigue laws, including compensations for non-zero mean stresses, to predict the fatigue life of engineering components.	Examination, Coursework

Teaching and Learning Methods

Lectures, examples workshops, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2112 Dynamics and Thermofluids

Year	2019/20
Level	2
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Define main motion descriptors (position, velocity and acceleration) for solid bodies, whose motion can be represented as those of particles, as well as the relation between such descriptors in the following coordinate systems: cartesian, polar and normal and tangential.	Examination, Coursework.
Recognise and correctly apply Newton's laws, principle of work and energy, principle and conservation of (linear and angular) impulse and momentum and conservation of energy to engineering applications.	Examination, Coursework.
Distinguish the different responses associated with single degree-of-freedom vibrating systems (free and forced responses) and explain the infleunce of key parameters, such as damping ratio, natural frequency and initial conditions.	Examination, Coursework.
Explain the physical content and implications of the second law of thermodynamics, including entropy, the Carnot and Brayton cycles and thermal efficiency, applying these to solve engineering problems.	Examination, Coursework
Evaluate the effects of fluid motion for a viscous internal and external flows, including the definition and calculation of the effects of boundary layers.	Examination, Coursework

Teaching and Learning Methods

Lectures, examples workshops, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2121 Materials Processing

Year	2019/20
Level	2
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	8.00
Work Based Learning	
Guided Independent Study	98.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	85			2	
Industrial visit assignment	15				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Describe the fundamental interactions between microstructure and processing in the determination of the mechanical properties of engineering materials.	Examination.
Describe the major classes of engineering materials (metals, ceramics, polymers, elastomers, glasses and hybrids) in terms of their structure, characteristic properties and the ways in which they are processed to produce engineering components.	Examination.
Analyse the process of phase change using phase diagrams, thermodynamics and kinetics.	Examination.
Analyse the influence of carbon content, heat treatments and other alloying elements on the properties of steels.	Examination.
Describe key engineering manufacturing processes, explain the resulting affect on microstructure and properties and select appropriate manufacturing approaches for engineering components.	Examination, Industrial visit assignment

Teaching and Learning Methods

Lectures, example classes, formative coursework activity, Industrial visit. Students who are unable to participate in the industrial visit will be provided with generic data to complete the assignment.

Guided Independent Study: Indicative Activities

Directed reading, example problems and preparing for, and completing industrial practice activity. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2302 System Dynamics and Control

Year	2019/20
Level	2
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	49.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	90.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	70			2	
Intermediate class exercise	30				
Examination	100		Yes	2	

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Define the basic properties of the Laplace transform, and apply it to describe signals and solve ordinary differential equations.	Intermediate class exercise, Examination.
Formulate simple models of mechanical and electrical systems based on physical principles.	Intermediate class exercise, Examination.
Analyse the dynamical properties of a SISO (Single-Input Single-Output) dynamical system described by a continuous-time transfer function..	Intermediate class exercise, Examination.
Discuss the performance specifications of feedback control loops in terms of stability, and robustness in the face of modelling uncertainties.	Examination.
Design a simple feedback loop both using the root locus method and the frequency domain approach.	Examination.

Teaching and Learning Methods

Lectures and example classes, intermediate coursework assessment.

Guided Independent Study: Indicative Activities

Directed reading, example problems. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2006 Integrated Engineering Design

Year	2019/20
Level	2
Period	**Sem2**
Occurrence	P
Spanning Years Y/N?	N
Credits	30
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	14.00
Seminars	4.00
Tutorials	4.00
Project Supervision	
Demonstration	
Practical Classes and Workshops	132.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	146.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	300.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Design, build and test project (final)	70				
Financial calculation assignment	10				
Business simulation performance	20				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Perform as a member of an effective interdisciplinary engineering team throughout the lifecycle of a project right from application to join the team through to post-testing evaluation of the product, including reflecting on their own learning and development.	Design, build and test project (incorporating assessment of CV/application, presentations and peer-assessment)
Conceive-design-implement-operate complex engineering systems in an interdisciplinary team using appropriate supporting engineering analysis and considering the trade-off between cost, quality and environmental performance.	Design, build and test project (incorporating assessment of Reports, poster, interviews, performance of designs)
Analyse financial results to determine the health of an engineering business and the success of business strategies and plans	Financial calculation assignment
Produce, implement and continuously improve a sustainable business strategy in a simulated business environment relevant to an engineering product	Business simulation performance (financial, management reports and presentation).
Present engineering and business results professionally both verbally and in writing, demonstrating the ability to discuss and defend professional judgements in the context of producing an engineering product which is an optimum business solution.	Design, build and test project Business simulation performance.

Teaching and Learning Methods

Lectures, design classes, computing and hardware practical classes, presentations, simulated CV application, interview and assessment centre-style group activity session, tutorials and general induction sessions.

NOTE: The nature of the assessment in this module is that it is not normally possible for the assessment to be re-taken, therefore failure of the module means termination of a student's course.

Guided Independent Study: Indicative Activities

Design, build and test; business simulations; group problem based learning.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2004 Engineering Experimentation and Analysis

Year	2019/20
Level	2
Period	**Sem2**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	
Supervised time in lab/studio/workshop	60.00
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	90.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Lab exercises and reports	70				
Formal Report 1	15				
Formal Report 2 (final)	15				
Reassessment Report	100		Yes		

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Plan and conduct experimental work, and analyse experimental data (using appropriate statistical and theoretical methods).	Laboratory notebooks, laboratory reports
Perform quantitative error analyses based on errors in measurements and from other sources, and use these to evaluate the significance of experimental findings.	Laboratory notebooks, laboratory reports
Discuss experimental results in the context of relevant background theory and engineering applications.	Laboratory notebooks, laboratory reports
Demonstrate an ability to write concise, professional, technical engineering reports of the standard expected in industry.	Laboratory reports
Transferable Skills: written communication; problem solving; information handling	Laboratory notebooks, laboratory reports

Teaching and Learning Methods

Laboratory practical classes, computer practical classes

Guided Independent Study: Indicative Activities

Pre-reading/lab preparation activities. Analysis of experimental data using appropriate computational methods; preparation of laboratory reports.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG2122 Applied Engineering Thermodynamics

Year	2019/20
Level	2
Period	**Sem2**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Identify, describe and analyse gas, vapour and combined thermodynamic cycles used for power generation and transport applications, including Otto, Diesel and Rankine cycles.	Examination and Coursework.
Identify and describe major features of different refrigeration and heat pump cycles used for industrial applications.	Examination and Coursework.
Describe exergy, which is the maximum useful work, and perform exergy analysis of closed and open thermodynamic systems.	Examination and Coursework.

Teaching and Learning Methods

Lectures, examples workshops, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3008 Engineering Management

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours Level

Student Workload	
Lectures	30.00
Seminars	15.00
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	4.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	101.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
VLE Assignment 1	15				
VLE Assignment 2	15				
VLE Assignment 3	15				
VLE Assignment 4	15				
Project Management Report (Final)	40				
Re-assessment assessment	100		Yes		

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Discuss the key principles and tools of project management in the context of their application to an engineering project	Project Management Report
Use commercial standard project management software tools for all PM activities	Project Management Report .
Distinguish the key concepts of Health, Safety & Environmental performance and Product / Cost Management and apply these to an engineering activity	Project Management Report, VLE assignments.
Distinguish the key concepts and terminology of People Management and undertake reflective review of their own development.	Project Management Report, VLE assignments.
Distinguish the key concepts and terminology of Business Management, Law and Quality Management as applied to engineering projects	VLE assignments

Teaching and Learning Methods

Project management lectures and workshops.

Lectures on Engineering Management topics assessed via VLE assignments.

Guided Independent Study: Indicative Activities

Project management activities conducted on individual project.

Independent study and reflection based on: lecture notes, personal work experience, current news, library and internet sources, etc

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3111 Finite Element Analysis and Design

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	EG2111
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Define and derive the finite element analysis (FEA) method for solving common engineering problems discussing the advantages and disadvantages.	Examination, Coursework.
Undertake hand calculations of stuctural elements that include effects such as shear deformation of beams and torsion of open sections to validate FEA simulations.	Examination, Coursework.
Solve linear elastic, static problems using FEA, explaining and assessing the assumptions used.	Examination, Coursework.
Use FEA to design engineering structures, including selecting appropriate materials and structure dimensions to withstand the applied loads	Examination, Coursework

Teaching and Learning Methods

Lectures, example classes, Formative coursework activity, design case studies.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3112 Heat Transfer and Energy Systems

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Use analytical and finite-difference methods to find solutions of steady/unsteady conduction problems;	Examination, Coursework.
Evaluate free and forced and convective heat transfer problems applicable to engineering components, including the effect of turbulence, the concepts of pool boiling and the implications of critical heat flux.	Examination, Coursework.
Determine gas mixture and gas-vapour mixture properties; perform thermodynamic analysis of reacting systems.	Examination, Coursework.
Describe the main features of different energy system components such as heat exchangers, boilers, pumps, fans and valves; select components for relevant applications and undertake basic design and sizing of these devices.	Examination, Coursework
Identify and describe renewable and unconventional energy sources and explain the operation of energy conversion technologies used for these sources.	Examination, Coursework

Teaching and Learning Methods

Lectures, examples workshops, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3124 Tribology in Engineering Design

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	EG2111
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Qualitatively describe typical surface characterisation techniques and their uses in engineering; assumptions and limitations of Hertzian contact mechanics and common non-Hertzian effects; the processes by which damage is incurred during typical wear mechanisms in engineering systems.	Examination, Coursework.
Derive mathematical models of common wear mechanisms.	Examination, Coursework.
Application of Hertzian contact mechanics in determining stress and pressure distributions in simple geometric contacts and an ability to select an appropriate contact model for a variety of engineering systems; friction principles to predict the performance of clutch and brake assemblies; common empirical techniques in the prediction of bearing life; understanding of lubrication regimes to recommend supply pressures and predict minimum film thicknesses in conformal and non-conformal contacts.	Examination, Coursework.

Application of sound mechanical, materials and tribological understanding in: the selection of bearings for a variety of engineering applications; recommending appropriate surface engineering solutions for a variety of applications.	Examination, Coursework
Analyse tribological systems in terms of relevant surface and material characteristics, contact geometry, relative motion, operating environment and lubrication mechanisms, and recommend appropriate friction control and wear prevention strategies.	Examination, Coursework

Teaching and Learning Methods

Lectures, examples sheets, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3125 Rigid Body and Structural Dynamics

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	EG2112
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Explain, demonstrate and apply concepts of linear and angular momenta in engineering dynamics, discussing the motion of a system of particles subject to internal and external forces.	Examination, Coursework.
Use the principles of kinetics of rigid bodies to formulate relevant mathematical models and to be able to choose appropriate methods to solve engineering problems.	Examination, Coursework.
Use Finite Element Analysis (FEA) models to explain the behaviour of engineering structures subject to dynamic loading.	Examination, Coursework.
Use the formulation of analytical and numerical methods to solve advanced problems in engineering dynamics.	Examination, Coursework
Analyse vibrations of multiple degree-of-freedom systems in practical engineering contexts.	Examination, Coursework

Teaching and Learning Methods

Lectures, examples classes, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3313 State Variable Control

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Define and discuss the basic properties of dynamical systems in state space form, and formulate simple state-space models of electrical or mechanical systems based on physical principles.	Examination, Coursework.
Apply the concept of linearisation to obtain local linear models of nonlinear systems.	Examination, Coursework.
Analyse the essential characteristics of a control system, including asymptotic stability, controllability and observability.	Examination, Coursework.
Design state feedback controllers and state observers, based on pole placement and on optimal control/filtering methods.	Examination, Coursework
Apply basic functionalities of the control software package Matlab in control system analysis and design.	Examination, Coursework

Teaching and Learning Methods

Lectures, examples classes, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes..

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3422 Aerospace Materials and Structures

Year	2020/21
Level	3
Period	**Sem1**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Explain the interaction of microstructure, processing and properties of light and high temperature alloys (e.g. Al, Ti and Ni alloys) used in airframe and aircraft propulsion components.	Examination, Coursework.
Select and critique the choice of materials in critical aerospace components and structures.	Examination, Coursework.
Describe and propose materials solutions to the practical aerospace design challenges of aeroelasticity, fatigue and corrosion.	Examination, Coursework.
Undertake design calculations, selecting and justifying material constituents, forms and manufacturing processes for composite laminates and sandwich panels.	Examination, Coursework
Describe the functionality and physical mechanisms applied in common 'smart' or 'multifunctional' materials and critique their aerospace applications.	Examination, Coursework

Teaching and Learning Methods

Conventional and flipped teaching sessions incorporating active learning, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3323 Digital Control and Actuators

Year	2020/21
Level	3
Period	**Sem2**
Occurrence	P
Spanning Years Y/N?	N
Credits	15
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	33.00
Seminars	
Tutorials	
Project Supervision	
Demonstration	
Practical Classes and Workshops	11.00
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	106.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	150.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Examination (final)	90			2	
Engagement with coursework	10				

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Analyse the properties of a dynamical system that includes digital and/or sampled elements	Examination, Coursework.
Discuss the performance specifications of computer controlled feedback loops	Examination, Coursework.
Design a simple feedback loop in a discrete time framework	Examination, Coursework.
Assess the operation of simple electro-mechanical and hydraulic actuators in a computer controlled system	Examination, Coursework

Teaching and Learning Methods

Lectures and example classes, formative coursework activity.

Guided Independent Study: Indicative Activities

Directed reading, example problems and completing formative coursework activities. Modules may also include activities such as pre-reading for flipped teaching sessions, group problem based learning, viewing screencasts or podcasts and computer simulation or online activities or quizzes.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Module Specification

Date created/amended: April 2018

Last amended by: Jingzhe Pan

EG3005 Individual Project

Year	2020/21
Level	3
Period	**Sem2**
Occurrence	P
Spanning Years Y/N?	N
Credits	30
Department	Engineering
Module Coordinator	
Pre-requisites*	
Co-requisites*	
Excluded combinations*	
Module Mark Scheme	Undergraduate
Minimum Assessment Level (UG only)	Honours level

Student Workload	
Lectures	
Seminars	
Tutorials	
Project Supervision	22.00
Demonstration	
Practical Classes and Workshops	
Supervised time in lab/studio/workshop	
Fieldwork	
External Visits	
Work Based Learning	
Guided Independent Study	278.00
Placement	
Year Abroad	
TOTAL MODULE HOURS	300.00

Assessment Element	**Percentage Split**	**Qualifying Mark***	**Alternative Reassessment***	**Examination Duration (hrs)**	**Due Date** (DL only)*
Technical Achievement	40				
Project Report (Final)	40				
Presentation	20				
Resit Assignment	100		Yes		

Mapping of Intended Learning Outcomes, including transferable skills, against Assessment Methods

On successful completion of the module, students should be able to:

Intended Learning Outcome	How Assessed
Complete a project integrating engineering knowledge and skills obtained throughout the undergraduate course	Technical Achievement
Write a final report on the project work, reflecting on achievements and judging the quality of the outcomes.	Final project report
Give a formal seminar presentation on the project outcomes.	Presentation

Teaching and Learning Methods

Each student is assigned a project supervisor, with whom they will have weekly meetings to provide feedback on progress and suggestions for future work. A project proposal and plan will be submitted 3 weeks after the project starts. The final report will be submitted at the end the semester. All students will do individual presentation on their project work.

The project must be passed at honours level for the award of an accredited BEng degree. Students who fail the project will be required to submit an alternative project report (on a topic which does not require practical work).

Guided Independent Study: Indicative Activities

Students will be expected to work independently for most of the time, reporting on progress weekly. Depending on the subject of the project, activities might include materials testing in the department's labs, writing software, researching, creating and analysing simulation models, designing hardware for manufacture.

*** INDICATES AN OPTIONAL FIELD, ALL OTHER FIELDS MUST BE COMPLETED**

Appendix 3: Skills matrix for Engineering Degrees

The table below shows the modules and other activities in which particular skills are developed and/or assessed. Skills that are generic to engineering work (e.g communicating by means of drawing conventions) feature in many modules, but are shown below where they are a principal focus of a module.

Skills Matrix: H300 BEng in Mech Eng													
Date amended: 13 March 2017													
Programme Learning Outcomes	EL0002,EL0005 (English)	EG0282; EG0283 (Fund)	EG1006 (Design & Exp)	EG1101 (Mech Eng)	EG1201 (E E E)	EG2006 (Design & Man)	EG2004(Exp & Analysis)	EG3008 (Management)	EG3005 (Project)	Math modules group	Materials & Struct Group	Control & Sig Proc group	Thermo &fluids group
(a) Discipline specific knowledge and competencies													
(vi) Other discipline specific competencies													
Select and conduct appropriate experimental procedures, using appropriate test and measurement equipment.			**X**				**X**		**X**				
Design products, processes or systems, as appropriate to the choice of degree and options, showing awareness of relevant issues such as manufacturing, operation, safety, economy, environmental implications.			**X**			**X**			**X**		**X**		
Read and produce relevant types of engineering drawings and diagrams in accordance with standard conventions.			**X**			**X**			**X**				
Operate and communicate effectively as an engineer.	**X**	**X**				**X**		**X**	**X**				
(b) Transferable skills													
(i) Oral communication													
Present and discuss technical information orally, in appropriate forms for given audiences.	**X**	**X**	**X**			**X**	**X**		**X**				
(ii) Written communication													
Report and discuss engineering work such as tests, calculations and designs in a form appropriate to the intended recipient, with appropriate use of scientific terminology and style.			**X**			**X**	**X**		**X**				

(iii) Information technology													
Use a broad range of common IT tools such as word-processor, spreadsheets, email, file transfer and the web.	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Use engineering IT tools and software where appropriate.			**X**			**X**		**X**	**X**	**X**	**X**		
(iv) Numeracy													
Manipulate and sort data to extract useful information.		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Judge the degree of accuracy appropriate to solving problems and presenting results		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
(v) Team working													
Work collaboratively as part of a team undertaking a range of different team roles.	**X**	**X**				**X**		**X**					
(vi) Problem solving													
Solve problems through the integration of knowledge of mathematics, science, information technology, design, business context and engineering practice.									**X**				
Use creativity and innovation in the solution of problems.									**X**				
Identify the key aspects of a problem and use estimates and approximations in its solution.									**X**				
(vii) Information handling													
Identify information that would be useful in specific design or project tasks; search for, assess, filter and communicate it.			**X**			**X**	**X**	**X**					
(viii) Skills for lifelong learning													
Learn independently and expand their knowledge and understanding of their discipline, using the mathematical and other knowledge gained during the course.		**X**				**X**	**X**		**X**				
Assess own skills and abilities; identify and address weaknesses and opportunities.		**X**				**X**	**X**		**X**				

Math modules group: EG0280, EG0281, EG1280, EG1281

Materials & Structure modules group: EG1101, EG2111, EG2121, EG3111, EG3124, EG3125, EG3422

Thermo & fluids modules group: EG1101; EG2112; EG2122; EG3112;

Control & signal processing modules group: EG2302; EG3313; EG3323