UNIVERSITY OF LEICESTER

Programme Specification (Undergraduate)

2018-19 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.	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.
Analyse systems, processes or components as part of the design process.	As above	
Evaluate commercial risks and technical risks in unfamiliar circumstances.	Problem solving exercises, independent research projects, group 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. Explore career development opportunities.	Work placement, simulation exercises, independent research. Independent research projects, group research projects,. Independent research projects, group research projects. Masterclasses, learning portfolios,	Simulation exercises, reports, independent projects. Independent project report, learning logs/diaries, learning portfolios. Independent project report, learning logs/diaries, 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

PRINCIPLE OF MARXISM AND THEORY OF SOCIALISM

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

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 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	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

the web.													
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