The Knowledge Hub
International University Institution of Egypt

partnered with
Coventry University

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The Knowledge Hub Universities Egypt

Course Specification A

BEng (Honours) Mechanical Engineering

TKHU028

School of Engineering

Academic Year: 2023/2024

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education. Changes have only been made where an aspect of the provision at Coventry University is not relevant to the delivery at TKH or where specific information relevant to the delivery of this course in Egypt must be introduced, e.g. entry requirements, course management.

PART A.1 Course Specification

BEng Mechanical Engineering

1. Introduction

There is a global shortage of engineers, computing scientists and construction professionals and employment opportunities remain extremely buoyant. The course is designed to foster a critical, analytical and experiential approach to embedded study skills and subject-specific academic English. The course supports students towards informed career choices, with awareness of their own strengths and knowledge of career pathways.

This document outlines Level 3 of the BEng Mechanical Engineering and should be considered along with Part A.2 BEng Mechanical Engineering document which considers level 4, 5 and 6.

Mechanical Engineering level 3
Level 3 of the course will normally introduce prospective students, where English is not their first language, to the key concepts in Mechanical Engineering as well as the academic study skills and language they will need to operate effectively at degree level. Successful completion of this year will enable progression to Level 4 of the BEng Mechanical Engineering programme. The level consists of 80 credits of subject-specific modules and 40 credits of academic English skills modules. The course will be fully taught in English with embedded specialist English-language and study skills to support students in their further undergraduate study in Coventry University/The Knowledge Hub degree courses.

The mathematics focused modules cover algebra, descriptive and inferential statistics, trigonometry, vectors and vector operations, differential and integral calculus, some simple solution methods for various types of differential equations and methods to characterise and handle uncertainty. The foundation Physics and the Applied Science and Engineering modules aim to develop the students working knowledge of the scientific theories that underpin the engineering disciplines. These modules develop students' scientific knowledge and laboratory skills and the relevant theory. Additionally, these modules introduce the application of theory through the use of design, including the concept of prototyping and the use of computer aided design.

2 Outline and Educational Aims of the Course

Level 3 in BEng Mechanical Engineering is designed to provide an introduction to relevant mathematic concepts and scientific theories and their application in the design of scientific solutions. It aims to develop knowledge and skills that can be applied to solving scientific and technical problems and during level 3 students will:

- Become familiar with the key concepts in Mechanical Engineering.
- Develop the language and subject-specific academic study skills necessary to study at university level.
- Manage their own learning and acquire transferable skills such as communication, initiative and problem solving that equips and orientates students for higher education.

Successful completion of the course enables progression to Level 4 of the BEng Mechanical Engineering programme.

Mechanical Engineering aims to provide students with a firm basis for onward study in this bachelor's degree and develop knowledge and skills that can be applied to solving scientific problems. The educational experience also aims to develop students' intellectual and personal skills.

It provides opportunities for students to:

- Acquire a broad knowledge of mathematical concepts and physical science theories relevant to science and its' technological, environmental, cultural, economic and social context;

- Develop practical skills appropriate to Engineering and Computing;
- Strengthen study skills and academic English language skills, specific to the subject areas;
- Become an independent learner and acquire transferable skills such as communication, presentation, visual and digital fluency, critical reflection, initiative and problem solving;
- Recognise and respond appropriately to ethical values, the public interest and professional standards;
- Develop appropriate skills, understanding and experience to prepare students for successful transition into further and higher education in Engineering and Computing.

3 Level 3 Course Learning Outcomes

A student who successfully completes the course will have achieved the following learning outcomes and be able to:

1. demonstrate an understanding of the relevant mathematical and scientific principles;
2. apply fundamental design and analysis methods to investigate and propose solutions to scientific problems;
3. apply knowledge of physical sciences to computing issues;
4. apply the necessary study and research skills in support of written, oral and group assessments;
5. contribute effectively to a team and implement the necessary planning to achieve objectives;
6. clearly communicate research, concepts, solutions and recommendations.

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4 Course Structure and Requirements, Levels, Modules, Credits and Awards

The Foundation year (Level 3) of the BEng in Mechanical Engineering.

Table 1a: Module structure for Level 3

Module Credit Level	Module Code	Module Title	Credit Value	Course Learning Outcomes	Semester
3	KH3123CEM	Applicable Mathematics	20	1,2	1
3	KH3125EXQ	Foundation Physics	20	1,2,3	1
3	KH3111HUM	Foundation Academic English 1 for Engineering and Computing	20	4,5,6	1
3	KH3129CEM	Applied and Computational Mathematics	20	1,2	2
3	KH3126EXQ	Applied Science and Engineering	20	1,2,3	2
3	KH3112HUM	Foundation Academic English 2 for Engineering and Computing	20	4,5,6	2

Progression to Level 4 Mechanical Engineering

To progress to Level 4 of the BEng in Mechanical Engineering degree, a student must have passed or been credited with **all** the modules.

5 Criteria for Admission and Selection Procedure

1 AS Level grade D and 5 GCSEs (including English Language, Mathematics and Science) at A*- C or 9 - 4 in the new GSCE grading structure OR 8 GCSEs (including English Language, Mathematics and Science) at A*- C or 9 - 4 in the new GSCE grading structure) OR Tawjihiya/General Secondary School certificate with minimum 60% OR Pass grades in IB Diploma.

In the case of applicants whose first language is not English, an adequate proficiency in English must be demonstrated. This would normally be a minimum IELTS score of 5.5 (with no less than 5.0 in each component) or equivalent.

All equivalent qualifications are welcome, as are mature students with alternative experience.

PART A.2 Course Specification

BEng Mechanical Engineering

1. Introduction

The BEng in Mechanical Engineering seeks to produce mechanical engineering graduates with the versatility and depth of understanding to deal with new and unusual challenges in mechanical engineering, alongside the necessary imagination and creativity to innovate.

It is designed to equip graduates with relevant, up-to-date skills and knowledge to work as a mechanical engineer in a broad variety of businesses, including engineering management, research, engineering design, development and consultancy. This degree will prepare students for chartership and hence to pursue successful careers and be leaders in the mechanical engineering related industries.

This course specification describes the programme of study for BEng Mechanical Engineering at The Knowledge Hub (New Capital, Egypt). This course sits in the School of Mechanical Engineering at Coventry University and the School of Engineering at The Knowledge Hub which have a reputation for excellent teaching, outstanding student experience and exciting research, utilising a state-of the art building with modern equipment and student facilities.

The student journey is one designed not only to provide technical excellence but also the skills required to work and integrate into a workplace. Level 3, the first year, provides foundation knowledge in the technical, scientific and mathematical subject areas. Level 4 and 5 continues with the first year themes but goes into greater depth.

Level 6 of the BEng course (the final year) is designed for students to be able to optimise their degree according to future aspirations. Option modules are available enabling students to individually tailor their programmes.

This course has one entry point in September.

Upon completion of the course, graduates can expect to find employment in a variety of industries. The importance of engineering is reflected around the globe. This is a very good time to study engineering.

2 Available Award(s) and Modes of Study

Title of Award	Mode of attendance	UCAS Code	FHEQ Level
BEng Honours Mechanical Engineering Fallback: BEng Mechanical Engineering Diploma of Higher Education (DipHE) Engineering Certificate of Higher Education (CertHE) Engineering	FT 3 year PT 6 years		6

3 Awarding Institution/Body	Coventry University

4 Collaboration	Autonomous Franchise
5 Teaching Institution and Location of delivery	Coventry University Branch at TKH The Knowledge Hub Universities Campus New Administrative Capital, Residential Area 7, R7, Cairo Governorate
6 Internal Approval/Review Dates	Date of approval/latest review: 03/2019 Date for next review: 2025/26
7 Course Accredited by	N/A
8 Accreditation Date and Duration	N/A
9 QAA Subject Benchmark Statement(s) and/or other external factors	Developed in line with **The Framework for Higher Education** Qualifications http://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf according to the **Subject Benchmark for Engineering** statements https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-engineering.pdf?sfvrsn=1f2c881_4 the **Engineering Council UK-SPEC Third edition** http://www.engc.org.uk/engcdocuments/internet/Website/UK-SPEC%20third%20edition%20(1).pdf and Professional Body, Institution of Mechanical Engineering (IMechE).
10 Date of Course Specification	May 2023
11 Course Director	TBA

12 Outline and Educational Aims of the Course

This BEng in Mechanical Engineering aims to provide students with a comprehensive understanding of mechanical engineering and develop knowledge, skills and expertise that can be applied to the engineering sector. The educational experience also aims to develop students' intellectual and personal skills, and give them the capability to undertake a practical research study and publish results. This will prepare students to pursue careers and be leaders in industry.

Specifically, the course aims to:

1. Create an educational environment that enables students to explore the current and emerging technologies, applications and digital tools used in Mechanical Engineering.
2. Provide a global experience and the opportunity for students to advance their engineering proficiency, develop new skills and knowledge.
3. Prepare students to become Chartered Mechanical Engineers and make significant contributions to the mechanical engineering profession, the economy and society.
4. Highlight the importance of research through research-based teaching and research-based group and individual projects, underpinned by activity led learning.
5. Create an educational environment that gives access to both academic and industrial experience.
6. Provide students with the opportunity to deal with complex issues, demonstrate creativity, self-direction and develop transferable skills.
7. Provide students with the opportunity to experience an industrial engineering in a work place enviroment.
8. Mentor students to be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.
9. Plan self-learning and improve performance as the foundation of lifelong learning and continuous professional development.

13 Course Learning Outcomes

A student who successfully completes the course will be able to:

1. Apply the necessary study and research skills to support the analytical, critical and reflective requirements of written, oral and group assessments.
2. Contribute to a team with the necessary planning, reviewing, adaptability, drive and leadership to achieve the required objectives and observe work schedules.
3. Clearly communicate research, concepts, solutions and recommendations, and demonstrate an approach to written and oral presentations appropriate to an engineering professional.
4. Demonstrate knowledge and understanding of the principles, theories and practices found in engineering management and leadership, consultancy and entrepreneurship.
5. Develop independent learning and problem-solving skills appropriate to current and future study and employment.
6. Apply engineering principles, science, mathematics, processes, materials, design and management to solve problems of increasing complexity.
7. Apply engineering analysis methods when solving complex problems and develop extended experience in solving problems related to a broad range of mechanical systems and components.
8. Generate, and appropriately communicate, design solutions through the application and comprehensive understanding of the engineering design processes.
9. Critically assess data and information using practical laboratory skills, experimentation and research, and establish the effect on design.
10. Understand risk assessment and the need for professional and ethical conduct in commercial and social contexts, informed by a knowledge of sustainable development and the regulations/legislation governing engineering activities.
11. Understand and evaluate a range of appropriate engineering materials, components and systems, identifying their limitations and likely developments.

14 Course Structure and Requirements, Levels, Modules, Credits and Awards

BEng students have a choice of 1 option modules from 6, at level 6.

Module code and name		Credit level	Credit Value (Ass. credit)	M/O	Course Learning Outcomes
BEng L4					
KH4020CMD	Engineering Mathematics 1	4	20 (20)	M	3,5,6,7
KH4000ME	Mechanical Science	4	20 (20)	M	3,6,8,9,11
KH4001ME	Manufacturing Technology and Materials	4	20 (20)	M	5,6,7,9,11
KH4004ME	Engineering Design	4	20 (20)	M	1,2,3,5,6,8,10,11
KH4002ME	Engineering Application	4	20 (20)	M	1,2,3,5,6,8,9,10
KH4001FTE	Electrical and Electronic Engineering Principles	4	20 (20)	M	5,6,7,11
BEng L5					
KH5000ME	Engineering Management	5	20 (20)	M	3,4,6,10
KH5003ME	Solid Mechanics and Dynamics	5	20 (20)	M	5,6,7,9,11
KH5001ME	Thermofluids Mechanics	5	20 (20)	M	5,6,7,9
KH5002ME	Analytical Modelling	5	20 (20)	M	5,6,7,9
KH5012ME	Design and Sustainability	5	20 (20)	M	1,2,3,5,6,8,9,11
KH5004ME	Instrumentation and Control	5	20 (20)	M	5,6,7
BEng L6					
KH6000ME	Professional Development and Project Planning	6	20 (20)	M	1,2,4,10
KH6001ME	Individual Project	6	20 (20)	M	1,3,5,7,9,10
KH6011ME	Mechanical Product Innovation	6	20 (20)	M	1,2,3,4,8,9,10
KH6012ME	Stress Analysis and Structural Dynamics	6	20 (20)	M	3,5,6,7,9,11
KH6002ME	Computational Thermofluids	6	20 (20)	M	3,5,6,7,9
OPTIONS	1 from 6				
KH6007ME	Finite Element Methods	6	20 (20)	O	3,5,6,7,9,11
KH6008FTE	Propulsion Systems and Aerodynamics	6	20 (20)	O	3,5,6,7,9,11
KH6015ME	Clean Energy	6	20 (20)	O	3,5,6,8,9,11
KH6003ME	Materials Analysis and Advanced Manufacturing	6	20 (20)	O	3,5,6,8,9,11
KH6014ME	Control Systems Engineering	6	20 (20)	O	3,5,6,7,9,11
KH6016ME	Biomechanics	6	20 (20)	O	3,5,6,8,9,11
Direct Entry Level 4 students for the purposes of Engineering Council Recognition ONLY must study the additional following modules					
KH6035MAA	Business Simulation	6	20 (20)		
KH6082MAA	Project Management	6	20 (20)		
KH6039MAA	New Product Development Strategies	6	20 (20)		

14.1 Progression through the course

To progress from one level to the next, students should normally pass all credit bearing modules. Students who fail to pass sufficient credit bearing modules to progress will be considered according to the Academic Regulations. The outcome will be at the discretion of the Programme Assessment Board (PAB).

14.2 Semester/One academic year of study at Coventry University (Optional)

The course structure and timing of delivery at The Knowledge Hub shall be aligned with the equivalent course at Coventry University to enable a student to complete a semester of study/one academic year at Coventry University as part of their studies. The marks achieved at Coventry University will be used in the assessment of the student's performance at the end of each level and used in the calculation of the final degree classification.

14.3 Admissions

Level 4 Entry

Students applying with an International Baccalaureate with a score of 31 points to include Mathematics and either Physics, Chemistry, Design Technology or IT at Higher level.

A-level: ABB - BBB to include Mathematics and one from Physics, Chemistry, Design Technology, Further Mathematics, Electronics, Computing, ICT or Engineering. Excludes General Studies.

Students who have achieved a Diploma with 2.5 GPA out of 4 or 3.0 CGPA out of 5 (Subject to syllabus match).

Students are required to have an IELTS score of at least 6.0 overall with a minimum of 5.5 in each skill or TOEFL iBT with a score of 79 and a minimum component score of 18.

Non-standard entry students will be considered on a case-by-case basis.

14.4 Conditions for the award of an honours degree

BEng Awards

To achieve the award of an Honours or Unclassified degree a student must achieve the minimum credits specified in the University Academic Regulations. All classifications are based on the calculation method described in the University Academic Regulations.

The modules counted in the classification calculation must include the following modules:

For Honours Degree	For Unclassified Degree
KH6001ME: Individual project and KH6011ME: Mechanical Product Innovation	No module requirement.

14.5 Fallback Awards

Students failing to meet the award requirements of the programme will be considered for alternative awards for which they satisfy the credit score count and other requirements. Fallback awards are BEng Mechanical Engineering (ordinary degree, non accredited), Diploma of Higher Education or Certificate of Higher Education as appropriate. The requirements for these awards are as specified in the University Academic Regulations.

Cascade of Awards:

The requirements for progression and awards:

BEng (Hons) Mechanical Engineering

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BEng Mechanical Engineering

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Diploma of Higher Education Engineering

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Certificate of Higher Education Engineering

14.6 Direct Entry Students seeking Engineering Council Recognition

Direct entry Level 4 students wishing to gain Engineering Council recognition must study the additional modules identified within the table above. These additional modules are not part of the Coventry University award.

15 Academic Regulations and Regulations of Assessment

This course conforms to the Regulations for the delivery of Coventry University Undergraduate awards at the Coventry University Branch at The Knowledge Hub, Egypt.

16 Indicators of Quality Enhancement

The Course is managed by the School of Engineering Board of Study, of The Knowledge Hub.

The Programme Assessment Board (PAB) for The Knowledge Hub is responsible for considering the progress of all students and making awards in accordance with both the University and course-specific regulations.

The assurance of the quality of modules is the responsibility of the Boards of Study which contribute modules to the course. This activity will be performed in partnership with Coventry University, UK.

External Examiners have the opportunity to moderate all assessment tasks and a sample of assessed work for each module. They will report annually on the course and/or constituent modules and their views are considered as part of the Collaborative Course Quality Enhancement Monitoring (C-CQEM). Details of the C-CQEM process can be found on The Knowledge Hub's web site.

Students are represented on the Student Forum and Board of Study, all of which normally meet two or three times per year. They are also represented at the branch board which happens once every year.

Student views are also sought through module and course evaluation questionnaires.

The QAA's Higher Education Review undertaken in February 2015 confirmed that Coventry University meets the UK expectations regarding the:

- setting and maintenance of the academic standards of awards
- quality of student learning opportunities
- quality of the information about learning opportunities
- enhancement of student learning opportunities

17 Additional Information

Enrolled students have access to additional, key sources of information about the course and student support including,

- Academic Course Director(s) are responsible for particular activities across the course and are able to provide advice and support to students in course-related matters;
- Student Handbook;
- Module Descriptors;
- CCQEM Reports;
- The Knowledge Hub Study Support Information.