



Programme Specification

Instrumentation and Control Engineering {Foundation} [GCET]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Instrumentation and Control Engineering {Foundation} [GCET]

Highest award: DipHE Instrumentation and Control Engineering

Interim award: CertHE Instrumentation and Control Engineering

Awarding institution: UWE Bristol

Affiliated institutions: Global College of Engineering and Technology (GCET)

Teaching institutions: Global College of Engineering and Technology (GCET)

Study abroad: No

Year abroad: No

Sandwich year: No

Credit recognition: Yes

Department responsible for the programme: FET Dept of Engineering Design & Mathematics, Faculty of Environment & Technology

Contributing departments: Not applicable

Professional, statutory or regulatory bodies: Not applicable

Apprenticeship: Not applicable

Mode of delivery: Full-time, Part-time

Entry requirements: For the current entry requirements see the UWE public website.

For implementation from: 01 October 2023

Programme code: H66A00

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: The programme is designed to provide the balance of theoretical and practical understanding needed to meet the demands of the instrumentation and control engineering in the industry for engineering practitioners, and in particular to the requirements set by Ministry of Higher Education, Research and Innovation (MoHERI) in Oman for Diploma Graduates.

To produce HE Diploma graduates with a broad understanding of the discipline in conjunction with a detailed understanding of their chosen specialism of electronic systems and instrumentation.

The programme produces HE Diploma graduates with a wide range of expertise relevant to the instrumentation and control engineering industry. The programme covers a broad range of disciplines such as digital and analogue circuit design, power electronics, control, instrumentations, sensors and transducers, signal processing and project management. A number of developments have occurred in electronic engineering in recent times, although signals are analogue in nature, many electrical or electronic designs involve conversion to digital format as soon as possible and processing by microprocessor or digital integrated circuit. In recognition of this, this programme allows students to develop expertise particularly in system design, microprocessor hardware/software design and simulation and modeling techniques.

The programme has been designed to cater for students with both industrial and/or academic backgrounds, to develop problem solving skills and be able to demonstrate leadership in a number of engineering situations.

Educational Aims: The general aims of the programme are:

Gain a sound knowledge and understanding of the fundamental principles governing the behaviour of instrumentation and control engineering and of the related mathematics;

Be capable of analysis of the behaviour of complex electronic, digital electronic or electrical systems;

Have a broad knowledge and understanding of engineering theory, practices and applications and be able to use advanced techniques of analysis, synthesis and simulation, and implementation in the field of electronic engineering or electrical engineering,

Be able to communicate clearly, concisely and persuasively with individuals and groups, using a professional standard of English, both orally and in writing.

Have the requisite academic knowledge, skills and preparation for progression to the final year of an appropriate Bachelors level degree.

Programme Learning Outcomes:

On successful completion of this programme graduates will achieve the following learning outcomes.

Programme Learning Outcomes

- PO1. Apply established control engineering concepts to solve engineering problems involving design, realization and development that arise across instrumentation and control engineering applications and technologies.
- PO2. Model appropriate quantitative methods and apply computer software tools for the evaluation, analysis and solution of instrumentation and control systems engineering problems and situations
- PO3. To design and analyse instrumentation and control engineering systems and be able to monitor and control and assess technical design in the industries
- PO4. To gain proficiency in operating and programming instrumentation of control systems
- PO5. Communicate and operate effectively both as individuals and as members of a team.
- PO6. Work effectively within the commercial, ethical and regulatory context of engineering processes, including sustainable development, risk management, health and safety and environmental legislation.

PO7. Make considered judgements and decisions on complex engineering issues in which not all facts and consequences are accurately known.

Part B: Programme Structure

Year 1

Full-time students must take 120 credits from the modules in Year 1.

Part-time students must take 60 credits from the modules in Year 1.

Year 1 Compulsory Modules (Full-time)

Full-time students must take 120 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFMFEG-30-0	Engineering Experimentation 2023-24	30
UFMFBG-30-0	Foundation Mathematics: Algebra and Calculus 2023-24	30
UF CFGK-30-0	Professional and Academic Skills 2023-24	30
UFCEXX-30-0	Program Design and Implementation 2023-24	30

Year 1 Compulsory Modules (Part-time)

Part-time students must take 60 credits from the modules in Compulsory Modules (Part-time).

Module Code	Module Title	Credit
UFMFEG-30-0	Engineering Experimentation 2023-24	30
UFMFBG-30-0	Foundation Mathematics: Algebra and Calculus 2023-24	30

Year 2

Full-time students must take 120 credits from the modules in Year 2.

Part-time students must take 60 credits from the modules in Year 2.

Year 2 Compulsory Modules (Full-time)

Full-time students must take 120 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFMFN7-15-1	C Programming 2024-25	15
UFMFF8-30-1	Digital Principles 2024-25	30
UFMFP8-15-1	Electrical and Electronic Principles A 2024-25	15
UFMFVA-15-1	Electrical and Electronic Principles B 2024-25	15
UFMFJ9-30-1	Engineering Mathematics 2024-25	30
UFMFCA-15-1	Practical Electronics 2024-25	15

Year 2 Compulsory Modules (Part-time)

Part-time students must take 60 credits from the modules in Compulsory Modules (Part-time).

Module Code	Module Title	Credit
UF CFGK-30-0	Professional and Academic Skills 2024-25	30
UFCEXX-30-0	Program Design and Implementation 2024-25	30

Year 3

Full-time students must take 120 credits from the modules in Year 3.

Part-time students must take 60 credits from the modules in Year 3.

Year 3 Compulsory Modules (Full-time)

Full-time students must take 120 credits from the modules in Compulsory Modules (Full-time).

Module Code	Module Title	Credit
UFMFV7-15-2	Control 2025-26	15

UFMFL9-15-2	Mathematics for Signals and Control 2025-26	15
UFMFNP-15-2	Measurements and Instrumentations 2025-26	15
UFMFKA-30-2	Microcontrollers Applications Group Lab 2025-26	30
UFMFHA-15-2	Project Management 2025-26	15
UFMFPK-15-2	Sensors, Transducers and Actuators 2025-26	15
UFMFMA-15-2	Signal Processing and Circuits 2025-26	15

Year 3 Compulsory Modules (Part-time)

Part-time students must take 60 credits from the modules in Compulsory Modules (Part-time).

Module Code	Module Title	Credit
UFMFP8-15-1	Electrical and Electronic Principles A 2025-26	15
UFMFJ9-30-1	Engineering Mathematics 2025-26	30
UFMFCA-15-1	Practical Electronics 2025-26	15

Year 4

Part-time students must take 60 credits from the modules in Year 4.

Year 4 Compulsory Modules (Part-time)

Part-time students must take 60 credits from the modules in Compulsory Modules (Part-time).

Module Code	Module Title	Credit
UFMFN7-15-1	C Programming 2026-27	15
UFMFF8-30-1	Digital Principles 2026-27	30

UFMFVA-15-1	Electrical and Electronic Principles B 2026-27	15
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Year 5

Part-time students must take 60 credits from the modules in Year 5.

Year 5 Compulsory Modules (Part-time)

Part-time students must take 60 credits from the modules in Compulsory Modules (Part-time).

Module Code	Module Title	Credit
UFMFL9-15-2	Mathematics for Signals and Control 2027-28	15
UFMFKA-30-2	Microcontrollers Applications Group Lab 2027-28	30
UFMFMA-15-2	Signal Processing and Circuits 2027-28	15

Year 6

Part-time students must take 60 credits from the modules in Year 6.

Year 6 Compulsory Modules (Part-time)

Part-time students must take 60 credits from the modules in Compulsory Modules (Part-time).

Module Code	Module Title	Credit
UFMFV7-15-2	Control 2028-29	15
UFMFNP-15-2	Measurements and Instrumentations 2028-29	15
UFMFHA-15-2	Project Management 2028-29	15
UFMFPK-15-2	Sensors, Transducers and Actuators 2028-29	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Designed in conjunction with key national and multi-national employers, the programme provides graduates with the mix of skills and capabilities required by UK business for the specification, design and delivery of measurements, instrumentation and control engineering and solutions, including safety systems, as required by the automation, oil and gas and electric power generation and distribution, aerospace, transport, medical, military and other industries.

This programme is delivered in a way that develops technically competent individuals who think and communicate effectively and who can solve problems, undertake critical analysis and deliver effective electronic and embedded software systems solutions in a continually changing business context.

It provides a solid foundation for lifelong learning, emphasising the development of knowledge, skills and professional values essential to the practice of systems development.

Part D: External Reference Points and Benchmarks

The following reference points and benchmarks have been used in the design of the programme

QAA UK Quality Code for HE <http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code>

Framework for higher education qualifications (FHEQ):
<http://www.qaa.ac.uk/publications/informationand-guidance/publication?pubID=2718#.Wm3lrkxuLIU>

National Qualifications Framework

Engineering subject benchmark statements
<http://www.qaa.ac.uk/en/Publications/Documents/SBSEngineering-15.pdf>.

All modules in the programme have been written to conform to the learning

outcomes required by the Engineering Council UK. This is mandatory for accredited engineering programmes. SEEC level descriptors <http://www.seec.org.uk/wp-content/uploads/2016/07/SEEC-descriptors-2016.pdf>

IET Handbook of Learning Outcomes for BEng and MEng programmes: <https://www.scribd.com/document/343619594/IET-Learning-Outcomes> . The specific outcomes are derived from the requirements for electronic and digital engineering described in The IET Handbook of Learning Outcomes for BEng and MEng programmes.

Strategies

UWE Strategy 2020

The programme addresses the following UWE Strategic Priorities:

Priority 1 Outstanding learning

Priority 2 Ready and able graduates

Priority 4 Strategic partnerships, connections and networks

GCET

This programme addresses GCET strategies through the following:

To produce “Able and Ready to Work Graduates”

To develop Distinctive Curriculum.

To establish assessment and feedback processes that enhance and deepen learning.

To promote research-informed education and evidence-based practice that supports an increasingly diverse student body.

To sustain and extend approaches to learning that further enhance the employability of GECT graduates and the career destinations they are able to reach.

To use technology and the campus environment to further enhance the student learning experience and teaching effectiveness within the context of a larger and more diverse student population

Staff research projects:

Research and industrial collaborations are key to several modules including UFMFHA-15-2, and UFMFKA-30- 2.

Employer interaction and feedback:

GCET works with a number of industrial partners through the Industrial Consultative Committee. Feedback from employers through their sponsored students also helped in the design of this programme. The programme provides part-time and flexible options which ensure an ongoing interaction with regional employers.

Part E: Regulations

Approved to University Regulations and Procedures.