**Module Descriptor**

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| **Title** | WBL1: Engineering Systems and Digital Technology | | |
| **Session** | 2026/27 | **Status** | |
| **Code** | WRKB070003 | **SCQF Level** | 7 |
| **Credit Points** | 20 | **ECTS (European Credit Transfer Scheme)** | 10 |
| **School** | **Computing, Engineering and Physical Sciences** | | |
| **Module Co-ordinator** | Thomas Haughey | | |

This Work-Based Learning (WBL) module enables students to develop an understanding of engineering systems and digital technologies through structured engagement with their workplace environment. The module supports students in integrating academic learning with professional engineering practice, allowing them to examine how engineering systems, digital technologies, data-driven approaches and Industry 4.0/5.0 concepts are applied within their employing organisations.

Students will undertake workplace-based investigations and reflective activities to explore engineering processes, operational systems, energy usage, sensing technologies, digital tools and organisational practices. Through guided academic support, students will critically reflect upon workplace experiences, professional responsibilities and emerging engineering technologies while developing skills in professional communication, reflective practice and lifelong learning.

Throughout the module students will:

- Examine engineering systems and processes within their workplace;
- Investigate the use of digital technologies, automation and engineering data;
- Reflect upon professional responsibilities and workplace practices;
- Evaluate opportunities for improvement through engineering and digital solutions;
- Integrate workplace experiences with academic learning through portfolio development.

During the course of this module students will develop their UWS Graduate Attributes (https://www.uws.ac.uk/current-students/your-graduate-attributes/ ). Universal: Academic attributes - critical thinking and analytical & inquiring mind; Work-Ready: knowledgeable, digitally literate and problem-solving; Successful: autonomous, collaborative and innovative.

| **Module Delivery Method** | **On-Campus[1]** | **Hybrid[2]** | **Online[3]** | **Work -Based Learning[4]** |
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[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

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| | ☐ | | ☐ | | ☐ | ☒ |
| **Campuses for Module Delivery** | ☐ Ayr<br>☐ Dumfries | | ☐ Lanarkshire<br>☐ London<br>☒ Paisley | | ☐ Online / Distance Learning<br>☒ Other (West College Scotland) | |
| **Terms for Module Delivery** | Term 1 | ☒ | Term 2 | ☐ | Term 3 | ☐ |
| **Long-thin Delivery over more than one Term** | Term 1 – Term 2 | ☐ | Term 2 – Term 3 | ☐ | Term 3 – Term 1 | ☐ |

| **Learning Outcomes** | |
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| **L1** | Investigate engineering systems, processes and technologies within a workplace environment. |
| **L2** | Evaluate the application of engineering principles, energy concepts and digital technologies used in professional practice. |
| **L3** | Communicate findings from workplace investigations using appropriate engineering and digital communication methods. |
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| **Employability Skills and Personal Development Planning (PDP) Skills** | |
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| **SCQF Headings** | **During completion of this module, there will be an opportunity to achieve core skills in:** |
| **Knowledge and Understanding (K and U)** | **SCQF 7**<br>Students will develop knowledge of engineering systems, systems representation, engineering quantities, energy and power concepts, digital technologies, sensing systems, cyber-physical systems, and Industry 4.0/5.0 principles. |
| **Practice: Applied Knowledge and Understanding** | **SCQF 7**<br>• Apply engineering concepts to workplace activities;<br>• Investigate engineering systems and digital technologies used within their organisation;<br>• Integrate workplace experiences with academic learning through reflective practice;<br>• Work constructively with feedback from academic staff and workplace mentors. |
| **Generic Cognitive skills** | **SCQF 7**<br>Students will develop analytical and problem-solving skills through interpretation of engineering systems, engineering calculations, system representations, and digital engineering case studies. |
| **Communication, ICT and Numeracy Skills** | **SCQF 7**<br>Students will develop communication, ICT, and numeracy skills through technical calculations, engineering diagrams, digital tools, technical |

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

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| | reporting, and presentation of engineering information. |
| **Autonomy, Accountability and Working with Others** | **SCQF 7**<br>Students will develop teamwork, independent learning, digital literacy, professional awareness, and collaborative working skills through workshop and practical engineering activities. |

| **Prerequisites** | **Module Code** | **Module Title** |
|---|---|---|
| | **Other** | |
| **Co-requisites** | **Module Code** | **Module Title** |

**Learning and Teaching**

For a standard taught 20-credit module, UWS normally expects 36–48 contact hours. However, in this Work-Based Learning module, a significant proportion of learning occurs within the student's workplace.

Students will engage in structured workplace investigations, reflective activities and professional discussions supported by academic supervision. Timetabled sessions will provide guidance on workplace enquiry, reflective practice, portfolio development and professional communication.

Active participation in workplace learning activities and engagement with academic support sessions is essential for successful completion of the module.

| **Learning Activities**<br>During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below: | **Student Learning Hours**<br>(Note: Learning hours include both contact hours and hours spent on other learning activities) |
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| Lecture / Core Content Delivery | **12** |
| Tutorial / Synchronous Support Activity | **24** |
| Laboratory / Practical Demonstration / Workshop | **0** |
| Independent Study | 164 |
| n/a | 0 |
| n/a | 0 |
| **TOTAL** | 200 |

**Indicative Resources**

**The following materials form essential underpinning for the module content and ultimately for the learning outcomes:**


- Mechanical Engineering Principles John Bird , Carl Ross (2019) 4th edn. Routledge.
- Bolton, W. (2021) *Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering*. 7th edn. Pearson.
- Gilchrist, A. (2016) *Industry 4.0: The Industrial Internet of Things*. Academic press
- Tao, F. & Qi, Q. (2019) *Digital Twin Driven Smart Manufacturing*. Academic Press
- Boud, D. and Solomon, N. (2001) Work-Based Learning: A New Higher Education? Buckingham: Open University Press.
- Zegwaard, K.E. and Pretti, T.J. (eds.) (2023) The Routledge International Handbook of Work-Integrated Learning.


**(N.B. Although reading lists should include current publications, students are advised**

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| **(particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)** |

| **Attendance and Engagement Requirements** |
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| **In line with the Student Attendance and Engagement Procedure, Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.**<br><br>**For the purposes of this module, academic engagement equates to the following:**<br><br>The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. Students will scan their attendance, via the attendance scanners, each time they are on-campus, they will have their attendance recorded in class and they will be expected to login to the VLE several times per week. Students who are unable to attend a timetabled session, due to illness or other circumstance, should notify their Programme Leader. Across the School an 80% attendance threshold is set. Students who fall below this, will be referred to the Student Success Team to see how they can be best supported in their studies. |

| **Equality and Diversity** |
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| **The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.**<br><br>In line with the University's commitment to equality, diversity, and inclusive learning, this module aims to provide equitable learning opportunities for students with diverse backgrounds and learning requirements. Module materials will be made available electronically through the Virtual Learning Environment (VLE) in accessible formats that support flexible access and engagement with learning content. The module complies with University policies and guidance relating to inclusive learning and teaching practices. As this module includes laboratory-based teaching activities, students who may require specialist assistive equipment, additional support, or reasonable adjustments to assessment are encouraged to discuss their requirements with the Module Co-ordinator in accordance with University policies and regulations. |
| **(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)** |

**Supplemental Information**

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| **Divisional Programme Board** | **Engineering Physical Sciences** |
| **Overall Assessment Results** | ☐ **Pass / Fail** ☒ **Graded** |
| **Module Eligible for Compensation** | ☐ **Yes** ☒ **No**<br>**If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.** |
| **School Assessment Board** | **Engineering** |
| **Moderator** | **Parag Vichare** |
| **External Examiner** | TBC |
| **Accreditation Details** | N/A |
| **Module Appears in CPD catalogue** | ☐ **Yes** ☒ **No** |
| **Changes / Version Number** | |

| **Assessment (also refer to Assessment Outcomes Grids below)** |
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| **Assessment 1** |
| Project Report (1000 words) - (50%)<br>Students analyse engineering systems or processes within their workplace. |
| **Assessment 2** |
| Portfolio (1000 words)- (50%)<br>Students evaluate the application of digital technologies, data systems, automation or Industry 4.0/5.0 practices. |
| **Assessment 3** |
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| (N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed.<br>(ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.) |

| **Component 1** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Type** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **Weighting of Assessment Element (%)** | **Timetabled Contact Hours** |
| Project Report | ☒ | ☒ | ☒ | ☐ | ☐ | 50% | 0 |

| **Component 2** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Type** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **Weighting of Assessment Element (%)** | **Timetabled Contact Hours** |
| Portfolio | ☒ | ☒ | ☒ | ☐ | ☐ | 50% | 0 |

| **Component 3** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Assessment Type** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **Weighting of Assessment Element (%)** | **Timetabled Contact Hours** |
| **Combined total for all components** | | | | | | 100% | 0 |

**Change Control**

| **What** | **When** | **Who** |
|---|---|---|
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