

Course Specification

Published Date:	14-May-2021
Produced By:	Oliver Jones
Status:	Validated

Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	Wolverhampton School of Sciences		
Course Code(s):	SE090H01UV	University of Wolverhampton	Full-time 3 Years
UCAS Code:			
Hierarchy of Awards:	Bachelor of Science with Honours Physics with Secondary Education (QTS) Bachelor of Science with Honours Physics with Secondary Education (QTS) Bachelor of Science with Honours Physics with Secondary Education (QTS) Bachelor of Science Physics with Secondary Education (QTS) Bachelor of Science Physics with Secondary Education Diploma of Higher Education Physics Certificate of Higher Education Physics University Statement of Credit University Statement of Credit		
Language of Study:	English		
Date of DAG approval:	25/Sep/2017		
Last Review:	2016/7		
Course Specification valid from:	2014/5		
Course Specification valid to:	2022/3		

Academic Staff

Course Leader:	Dr Fabrice Laussy
Head of Department:	Georgina Manning

Course Information

Location of Delivery:	University of Wolverhampton
Category of Partnership:	Not delivered in partnership
Teaching Institution:	University of Wolverhampton
Open / Closed Course:	This course is open to all suitably qualified candidates.

Entry Requirements:

Entry requirements are subject to regular review. The entry requirements applicable to a particular academic year will be published on the University website (and externally as appropriate e.g. UCAS)

- A minimum of 136 UCAS points from at least two A Levels or equivalent
- Post-16 qualifications should include study of Physics and Mathematics at A Level, with pass grades being obtained in both of these subjects.
- Achieve the Access to HE Diploma gaining 60 credits in total with at least 45 credits achieved at level 3, of which 36 credits must be in science based units at level 3, including passes in Physics units: at least 27 of these 36 credits must be achieved at Merit or above and 9 credits with Pass or above.
- Applicants will be expected to hold GCSE English language and Mathematics at grade C or equivalent
- As part of the selection procedures, have taken part in a rigorous selection process designed to assess their suitability to teach, including a Disclosure and Barring Service (DBS) check.

Distinctive Features of the Course:

This course is subject to the relevant government agency documentation and requirements for initial teacher training that inform the management, structure and content of the course.

These are currently:

- Department for Education (DfE)
- National College for Teaching and Leadership (NCTL)
- Office for Standards in Education (OFSTED)

Educational Aims of the Course:

The BSc (Hons) Physics with Secondary Education course provides a high standard of both physics subject content and pedagogical knowledge, in addition to preparing students to take up a physics teaching post in the secondary sector. The course reflects the specific and precise quality frameworks established by the relevant national government agency, and complies fully with the relevant teaching standards framework. It aims to foster an intellectual curiosity in the science underlying the nature and properties of matter and energy in conjunction with a desire to impart this curiosity to others. An underpinning knowledge base will be developed in the structure and behavior of the objects and technologies that surround us on a daily basis and you will explore key topics including mechanics, optics, electromagnetism—at both the classical and quantum level—and how these are articulated and combined together to give rise to the physics of the solid state. The degree program will be supported by strong foundation teaching in study skills, with additional instruction in mathematics and computing skills provided throughout the course. Practical work will be incorporated into each level of study to encourage an appreciation of the application of theory and all students will be given the opportunity to undertake their own education-based research project in physics in the final year of study. All students will produce a Physics Skills e-portfolio over the duration of their studies which will act as a showcase of their skills for future employers. The University of Wolverhampton Enterprise and Employability Award is embedded into the course, with all first year students completing the Bronze Award, the Silver Award being completed during your second year of study and the Gold Award completed during the final year.

The BSc (Hons) with Secondary Education is specifically designed to ensure that those who are successful can

be recommended to the relevant professional body for the award of Qualified Teacher Status (QTS) – the recognised professional award required by all those who wish to teach in a maintained school. As a trainee you will learn how to teach physics to pupils in the 11-16 age range within the secondary age phase, with additional primary and post-16 enhancements. Trainee teachers who are recommended for the award of QTS will be well-placed to obtain employment in schools.

The course is designed to develop secondary school teachers who will be:

- empathetic and committed to pupils' learning;
- reflective and reflexive;
- enthusiastic and innovative;
- open-minded and research-aware
- capable of engaging in practitioner research
- flexible and creative
- knowledgeable – both in physics, mathematics and pedagogically
- up-to-date with the most recent developments in a variety of fields of Physics

The course will also help a student to develop as a teacher who understands the link between subject knowledge and the curriculum knowledge needed to teach their subject. Equally we seek to develop teachers who understand the needs of the individual pupil and the school community in which they will work.

Intakes:

September

Major Source of Funding:

Department for Education

Tuition Fees:

Tuition fees are reviewed on an annual basis. The fees applicable to a particular academic year will be published on the University website.

Year	Status	Mode	Amount
2020/1	H	Full Time / Sandwich	£9250.00
2020/1	Overseas	Full Time / Sandwich	£12250.00
2021/2	H	Full Time / Sandwich	£9250.00
2021/2	Overseas	Full Time / Sandwich	£12950.00

PSRB:

None

Course Structure:

September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 1

Full time and Sandwich Undergraduate Honours students normally study 120 credits per academic year; 60 credits semester 1 and 60 credits semester 2.

Module	Title	Credits	Period	Type
4AP001	Optics	20	SEM1	Core
4MM011	Mathematics for Physicists	20	SEM1	Core
4MM012	Mechanics	20	SEM1	Core
4AP004	Electromagnetism I	20	SEM2	Core
4AP003	Quantum Mechanics	20	SEM2	Core
4SE001	Subject-specific Pedagogy: Justifying the Specialist Subject	20	SEM2	Core

September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 2

Full time and Sandwich Undergraduate Honours students normally study 120 credits per academic year; 60 credits semester 1 and 60 credits semester 2.

Module	Title	Credits	Period	Type
5AP001	Electromagnetism II	20	SEM1	Core
5AP002	Solid State Physics	20	SEM1	Core
5AP005	Quantum Physics	20	SEM2	Core
5SE001	Subject-specific Pedagogy: Teaching the Specialist Subject	20	SEM2	Core
5SE002	Professional Development: The Beginning Teacher	20	YEAR	Core

Linked Option Group Rule: Select a minimum of 20 credits and a maximum of 20 credits from the linked (*) groups.

***For this option group you must choose a minimum of 0 credits and a maximum of 20 credits**

If you have studied and passed 4SE001 at level 4 then you MUST select 5AP003. If you have not taken 4SE001 at level 4 then you MUST select 5SE003.

5AP003	Mathematical Methods	20	SEM1	
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***For this option group you must choose a minimum of 0 credits and a maximum of 20 credits**

5SE003	Subject Specific Pedagogy 1a: Exploring the Teaching of the Specialist Subject	20	SEM1	
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September (Full-time)

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Year 3

Full time and Sandwich Undergraduate Honours students normally study 120 credits per academic year; 60 credits semester 1 and 60 credits semester 2.

Module	Title	Credits	Period	Type
6AP010	Modern Physics	20	SEM1	Core
6AP009	Research 2	20	SEM1	Core
6SE007	Professional Development: The Developing Teacher	40	YEAR	Core
6SE008	Subject-specific Pedagogy: Investigating Practice	20	SEM2	Core
6AP003	Research Project 1	20	YEAR	Core

Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, to create the best learning experience.

Learning, Teaching and Assessment

Academic Regulations Exemption:

Section 1.2.3 - Exemption for delivery outside the standard University Academic Calendar in order to enable students to complete the required hours for two placement modules;

5SE002 Professional Development: The Beginning Teacher.

6SE007 Professional Development: The Developing Teacher.

Including exemption from the standard University Academic Framework, allowing for an unbalanced programme of study at Level 5 and Level 6, by including Year Long modules.

Section 1.3.3 - Exemption to exclude the use of non-subject option modules at Level 4, Level 5 and Level 6 in order to meet QTS requirements.

Section 4.3.3 - Exemption in accordance with the Professional Body requirements for Qualified Teacher Status (QTS). There will be no automatic right to a second attempt for any failed practice components at the discretion of the Assessment Board (second attempts are permitted for theory components);

5SE002 Professional Development: The Beginning Teacher.

6SE007 Professional Development: The Developing Teacher.

Section 4.4.3 - Exemption in accordance with the Professional Body requirements for Qualified Teacher Status (QTS). Compensation will not be permitted for any core modules which are required in order to meet these standards;

4SE001 Subject-specific Pedagogy: Justifying the Specialist Subject

5SE001 Subject-specific Pedagogy: Teaching the Specialist Subject

5SE002 Professional Development: The Beginning Teacher

5SE003 Subject Specific Pedagogy 1a: Exploring the Teaching of the Specialist Subject

6SE007 Professional Development: The Developing Teacher

6SE008 Subject-specific Pedagogy: Investigating Practice.

Students are normally required to gain a minimum of 120 credits before commencing the next level of study.

APPROVED by AFRSC on 28/3/2019.

Reference Points:

Quality Code - [Part A: Setting and Maintaining Academic Standards](#). Including;

[Qualifications Frameworks](#)

[Characteristics Statements](#)

[Credit Frameworks](#)

[Subject Benchmark Statements](#)

Quality Code - [Part B: Assuring and Enhancing Academic Quality](#)

[University Policies and Regulations](#)

Equality Act (2010).

Initial Teacher Training Criteria and Supporting Advice (DfE, June 2020) [Initial Teacher Training Criteria and Supporting Advice](#)

The recommendation of Qualified Teacher Status (QTS) is subject to meeting the Teachers' Standards. These standards set the minimum requirements for teachers' practice and conduct.

Teachers' Standards (DfE, 2011) [Teachers' Standards](#)

Initial Teacher Training Courses are subject to inspection by the Office for Standards in Education (OFSTED).

Ofsted Handbook (Ofsted, June 2020) [Ofsted Initial Teacher Education Inspection Handbook](#)

Learning Outcomes:

CertHE Course Learning Outcome 1 (CHECLO1)

"Demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study, and an ability to evaluate and interpret these within the context of that area of study"

CertHE Course Learning Outcome 2 (CHECLO2)

"Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study."

CertHE Course Learning Outcome 3 (CHECLO3)

Evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work

CertHE Course Learning Outcome 4 (CHECLO4)

"Communicate the results of your study/work accurately and reliably, and with structured and coherent arguments"

CertHE Course Learning Outcome 5 (CHECLO5)

Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility

DipHE Course Learning Outcome 1 (DHECLO1)

"Demonstrate knowledge and critical understanding of the well-established principles of your area(s) of study, and of the way in which those principles have developed with an understanding of the limits of your knowledge, and how this influences analyses and interpretations based on that knowledge."

DipHE Course Learning Outcome 2 (DHECLO2)

"Demonstrate the ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context"

DipHE Course Learning Outcome 3 (DHECLO3)

"Demonstrate knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study"

DipHE Course Learning Outcome 4 (DHECLO4)

"Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis"

DipHE Course Learning Outcome 5 (DHECLO5)

"Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively"

DipHE Course Learning Outcome 6 (DHECLO6)

"Demonstrate the qualities and transferable skills necessary for employment, requiring the exercise of personal responsibility and decision-making and undertake further training, developing existing skills and acquire new competences that will enable them to assume significant responsibility within organisations."

Ordinary Degree Course Learning Outcome 1 (ORDCLO1)

demonstrate a knowledge and understanding of the fundamental laws of physics and their principles.

Ordinary Degree Course Learning Outcome 2 (ORDCLO2)

apply the principles of physics to solve problems using appropriate mathematical tools.

Ordinary Degree Course Learning Outcome 3 (ORDCLO3)

establish an ability to use mathematical techniques and appropriate ICT packages/systems and analysis to model physical behaviour

Ordinary Degree Course Learning Outcome 4 (ORDCLO4)

demonstrate a familiarity with practical techniques associated with physics

Ordinary Degree Course Learning Outcome 5 (ORDCLO5)

"act independently, exercise initiative and act as a positive role model in a range of complex teaching and learning situations"

Honours Degree Course Learning Outcome 1 (DEGCLO1)

demonstrate a sound knowledge and understanding of the fundamental laws of physics and their principles.

Honours Degree Course Learning Outcome 2 (DEGCLO2)

apply the principles of physics to solve problems using appropriate mathematical tools.

Honours Degree Course Learning Outcome 3 (DEGCLO3)

establish an ability to use mathematical techniques and appropriate ICT packages/systems and analysis to model physical behaviour

Honours Degree Course Learning Outcome 4 (DEGCLO4)

show competence in practical techniques associated with physics

Honours Degree Course Learning Outcome 5 (DEGCLO5)

"act independently, exercise initiative and act as a positive role model in a range of complex teaching and learning situations"

Honours Degree Course Learning Outcome 6 (DEGCLO6)

display the technical pedagogical and subject competence to meet the standards required to be recommended for QTS and to teach physics in secondary schools

Overview of Assessment:

Module	Title	Course Learning Outcomes
4AP001	Optics	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
4AP003	Quantum Mechanics	CHECLO1, CHECLO2, CHECLO3, CHECLO4
4AP004	Electromagnetism I	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
4MM011	Mathematics for Physicists	CHECLO1, CHECLO2, CHECLO3, CHECLO4
4MM012	Mechanics	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
4SE001	Subject-specific Pedagogy: Justifying the Specialist Subject	CHECLO1, CHECLO3, CHECLO4
5AP001	Electromagnetism II	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5, DHECLO6
5AP002	Solid State Physics	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5, DHECLO6
5AP003	Mathematical Methods	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5
5AP005	Quantum Physics	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5, DHECLO6
5SE001	Subject-specific Pedagogy: Teaching the Specialist Subject	DHECLO2, DHECLO3, DHECLO4, DHECLO5, DHECLO6
5SE002	Professional Development: The Beginning Teacher	DHECLO2, DHECLO3, DHECLO4, DHECLO5, DHECLO6
5SE003	Subject Specific Pedagogy 1a: Exploring the Teaching of the Specialist Subject	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5
6AP003	Research Project 1	DEGCLO1, DEGCLO2, DEGCLO3, DEGCLO4, ORDCLO1, ORDCLO2, ORDCLO3, ORDCLO4
6AP009	Research 2	DEGCLO1, DEGCLO2, DEGCLO3, DEGCLO4, ORDCLO1, ORDCLO2, ORDCLO3, ORDCLO4
6AP010	Modern Physics	ORDCLO1, ORDCLO2, ORDCLO3
6SE007	Professional Development: The Developing Teacher	DEGCLO5, DEGCLO6, ORDCLO5
6SE008	Subject-specific Pedagogy: Investigating Practice	DEGCLO5, ORDCLO5

Teaching, Learning and Assessment:

A structured acquisition of knowledge and understanding of physics will be developed through traditional lectures supported by problem solving work in tutorial classes. The applications of physics will be enhanced by contributions from employers within the subject area. Students will be presented with theoretical information in lecture sessions and then will use workshops, group tutorials, seminars, directed reading and a range of IT-based activities such as on-line computer packages and electronic tutorials to develop these concepts. Many of these tutorials will focus on problem based learning where students are required to utilise their knowledge to solve problems in applied subjects. The learning activities shall be focused on moving from a more tutor-centred approach in the earlier parts of the course towards a student-centred learning approach in the latter stages. Formative assessments will be used to allow a student to assess their own understanding and provide indications to staff on their attainment.

Skills development forms an important part of the programme of study with both generic skills and practical skills being embedded throughout. All students will be required to construct an electronic Physics Skills e-portfolio throughout their whole degree programme. Each subject based workshop and practical class will require students to complete a short skills assessment of what has been achieved in that class which will be uploaded to their e-portfolio. Students will be required to share their e-portfolio to their personal tutor at the end of each semester in order to obtain formative feedback at a scheduled personal tutor meeting.

Generic skills will be embedded throughout the whole programme of modules. First year, first Semester modules will teach students how to make use of learning resources, including appropriate texts, research articles and electronic resources and will guide them in the correct use of information sources as well as good academic practice including scientific writing, correct referencing and avoidance of plagiarism. Formative use of plagiarism software will be incorporated in order to foster this aim. A further introduction to study skills will be provided as part of the 4AP003 Quantum Mechanics module, where students will be intensively trained in the self-study of a material by direct supervision in-class. In subsequent modules, students will be given opportunities to effectively communicate scientific information through the production of clear and accurate scientific essays, practical reports and presentations. Computer skills will be developed throughout the course, starting with 4AP006 that provides the basics of programming and data manipulation. A high capability in mathematical skills is critical for the physicist, including ability in numerical manipulation, presenting and interpreting information graphically, developing an ability to use mathematical techniques and analysis to model physical behaviour, alongside dealing with more abstract concepts. A strong emphasis will be placed on mathematics throughout the course, through Physics-tailored modules starting with 4MM011 Mathematics for Physicists. Students will be trained to develop effective time management skills throughout the whole of their course, contributing towards the management of their own learning.

Practical skills will be embedded within modules to develop competency, alongside an appreciation of the link between theory and practice, and as an incentive to use such practical illustrations of theoretical concepts in their future teaching. The opportunity to develop additional practical skills, such as engineering workshop skills, exists during University Career Development Week activities. These additional skills can be evidenced in the student's Physics Skills e-portfolio and will contribute towards their future employability.

In addition to the development of Learning Outcomes pertaining to Physics, students will develop competency in teaching skills. Trainee teachers undertake a minimum of 120 days training in school as part of this course. Successful completion of the school placement modules leads to recommendation for Qualified Teacher Status (QTS). Trainee teachers recommended for the award of QTS will be well-placed to obtain employment in schools as qualified teachers. During the first two years of the course you will be required to gain non-credit bearing experiential learning in a secondary school. During your final year of study you are required to complete two placements consisting of 4 days per week over 6 weeks and 10 weeks respectively which contribute towards credit bearing education modules. All students in their final year of study will be required to complete a physics-education based project. This provides the student with the opportunity to undertake their own research into an education based problem whilst developing an in depth understanding of research methodology and data analysis.

Learning activities to support the learning outcomes of the course will include:

- Reflective Journal Entries
- University Professional Studies Sessions
- University Specialist Subject Sessions
- Audit and action planning
- Construction of personal timeline of education
- Review of progress towards standards to Qualified Teacher Status
- Experience in school, including:
 - Professional studies placement
 - Primary School placement
 - Two major teaching placements
 - School-based activities and tasks
- Personalised opportunities for enhanced professional development
- Compiling teaching files
- Record of Professional Development
- Subject Specific Research Project
- Career Entry and Development Portfolio

The University Enterprise and Employability Award is embedded within the course and the tasks associated with the award will be completed and uploaded to the Physics Skills e-portfolio. The 4AP006 Scientific Computing module will introduce students to the employability skills that are needed within a Physics orientated career and will introduce the range of careers suitable for a physics graduate. Completion of

workshop tasks within this module will enable students to obtain the Bronze award. Students will subsequently complete the Silver Award as part of the Subject Specific Pedagogy 1a: Exploring the Teaching of the Specialist Subject module. During this module students will be required to complete a skills analysis, a written application or CV highlighting their skills and carry out an evaluation of becoming a physics teacher as a possible career option. All students will be required to produce a career action plan and deliver a presentation in their final year discussing their skills and career aspirations and they can use these alongside their teaching practice to qualify for the Gold Award.

A wide range of assessments are incorporated into the course in order to facilitate student understanding, including:

- Phase tests/ end Examinations (seen and unseen, MCQ's, extended question and essay type exams)
- Practical reports and/or portfolios of practical reports
- Case studies and problem solving exercises
- Oral and Poster Presentations
- Written assignments
- Personal Development Portfolio in the form of the Physics Skills e-portfolio
- Structured assessment of a physics education research project (from planning through to thesis submission)

The assessment requirements of the course include the need for trainees to demonstrate that they have reached the standards required for Qualified Teacher Status. The assessment methods will include;

- Written assignments and presentations to tutors and peers to demonstrate secure subject knowledge and understanding, the ability to undertake research and the ability to reflect critically on their own teaching practice;
- Completion of school-based activities to demonstrate the ability to observe and research into classroom practice;
- Two sustained periods in school undertaking the full range of the teacher's duties and taking increasing independent responsibility for organising and managing teaching and learning across all of the specified secondary age groups for which they are being trained. Also, there will be a report on a short placement in a primary school.
- Compilation of two teaching files
- Record of Professional Development.

Students are supported in many ways:

Each student will be allocated a personal tutor who can provide general help, advice, guidance and, if required, direct them to services such as the Student Office, Counselling Services, Student Enabling Centre, Student's Union, Chaplaincy (all Faiths), Study Skills (Learning centre, see below). The personal tutor will also be responsible for advising on progress of the Physics Skills e-portfolio each semester.

Module-specific support is provided through the module team via face-to-face and electronic tutorials, scheduled drop-in sessions or SAMS (Student Appointment Management System) appointments. Feedback from formative and some summative assessments will support learning by assisting the student in identifying and improving areas of weakness, and further developing areas of strength.

The team of Teaching Associates in the Faculty of Science and Engineering provides drop-in sessions for general study skills advice. Students will be also supported with study skills and mentoring support by the team of Graduate Teaching Assistants and student Peer Support 'Study Buddies' in the faculty.

The Faculty of Science and Engineering also offers a Student Support Team (located in the Faculty Administration Office) and this is a key additional source of support, particularly for non-academic related matters. This tends to be a student's first port of call and the team can advise students and, if required direct them to further University services as mentioned above.

There are also a range of support facilities (relating to assessment tasks) that are available in the Learning Resource Centre for students to access including the Maths Support Centre.

Assessment Methods:

At the University of Wolverhampton, a variety of modes of assessment will be used to support and test your learning and progress and to help you develop capabilities that are valued beyond your University studies and into your working life. Your course may include a variety of assessment activities:

Written examinations (including online examinations, open and closed book examinations and quizzes)
Coursework (for example, essays, reports, portfolios, project proposals and briefs, CVs, poster presentation)
Practical (for example, oral and video presentations, laboratory work, performances, practical skills assessment)

In the final year of your undergraduate degree, and at the end of your postgraduate degree, you are likely to be expected to write an extended piece of work or research, such as a dissertation or a practice-based piece of research.

Student Support:

Each student will be allocated a personal tutor who can provide general help, advice, guidance and, if required, direct them to services such as the Student Office, Counselling Services, Student Enabling Centre, Student's Union, Chaplaincy (all Faiths), Study Skills (Learning centre, see below). The personal tutor will also be responsible for advising on progress of the Physics Skills e-portfolio each semester.

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Employability in the Curriculum:

Practical skills will be embedded within modules to develop competency, alongside an appreciation of the link between theory and practice, and as an incentive to use such practical illustrations of theoretical concepts in their future teaching. The opportunity to develop additional practical skills, such as engineering workshop skills, exists during University Career Development Week activities. These additional skills can be evidenced in the student's Physics Skills e-portfolio and will contribute towards their future employability.

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