

PROGRAMME SPECIFICATION

Bachelor of Science with Honours in Product Design Engineering

Awarding institution	Liverpool John Moores University
Teaching institution	LJMU
UCAS Code	H772
JACS Code	H150
Programme Duration	Full-Time: 3 Years, Sandwich Thick: 4 Years
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	Engineering Council UK Spec. Engineering (2015)
Programme accredited by	Institution of Engineering Designers (IED)
Description of accreditation	Delivers all of the educational requirements for Incorporated Engineer status with the Institution of Engineering Designers. Details can be found at:- http://www.ied.org.uk/courses
Validated target and alternative exit awards	Bachelor of Science with Honours in Product Design Engineering Bachelor of Science with Honours (SW) in Product Design Engineering Diploma of Higher Education in Product Design Engineering Diploma in Higher Education (SW) in Product Design Engineering Certificate of Higher Education in Product Design Engineering
Programme Leader	Adam Papworth

Educational aims of the programme

The BSc. (Hons) Product Design Engineering (PDE) programme fulfils the educational requirements for Incorporated Engineer (IEng) status. It is designed to develop a high level of technical expertise together with the emotional intelligence to be able to prepare students for their future career in the design sector. It achieves this by providing the education, together with a broad range of transferable and management skills appropriate to the design profession. This will enable under graduates to secure internships and work effectively in their initial appointments and provide a strong basis for future career development. The programme investigates engineering, product and industrial design, with a focus on innovation and subsequent detail design work. In particular, the programme focuses on the development of products and components from the early stages of the New Product Design (NPD) process, through CAD modelling, materials selection, prototype development and manufacturing proving. Additionally, the sandwich programme aims to give students first-hand knowledge and experience of the practice of design in the UK and European industry and the operation and internal structure of typical design based companies.

The programme aims to:

Develop core knowledge, and understanding of key design principles.

Cover the technical subjects appropriate for the needs of today's industrial and product designers working towards a sustainable future.

Enable students to develop knowledge, intellectual and practical skills that will enable them to take a leading role in the identification and solution of problems and the development of robust design solutions.

Investigate and explore idea creation mechanisms and techniques used to foster creativity within design teams and the typical commercial environment.

Allow students to gain knowledge about enterprise, innovation and the influence of standards and environmental legislation on innovation and the design process.

Develop student's study and personal skills so that they progressively take responsibility for their own learning, becoming independent learners, whilst receiving appropriate tutoring and support.

Equip students with a range of transferable skills and attributes in the use of computers, software packages,

team working, communication, time management and problem solving methodology which will enable them to undertake responsible roles in industry and commerce.

Additionally, the sandwich programme aims to:

Provide students with an extended period of work experience at an approved partner that will complement their programme of study at LJMU. This will give the students the opportunity to develop professional skills relevant to their programme of study, as well as attitude and behaviours necessary for employment in a diverse and changing environment. It will give students first-hand knowledge and experience of the practice of design in the UK and European industry and the operation and internal structure of typical design based companies.

Provide a degree programme which meets the accreditation requirements of AHEP-3 UK Spec and the needs of industry.

Alternative Exit/ Interim Award Learning Outcomes - Certificate of Higher Education

A student who is eligible for this award will be able to:

Apply creative and imaginative approaches in problem solving and the development of designs

Develop a design concept using hand sketching and 2D sketching software techniques.

Use solid modelling techniques in the creation of 3D parts and assemblies

Use knowledge of mathematics and electrical engineering theory in the selection and use of digital and analogue electronic components to solve a problem.

Create a program to operate embedded intelligent controllers within an electronic system.

Define the micro-structural characteristics of a range of engineering materials and identify the relationships between manufacturing processes and material behaviour.

Demonstrate a clear understanding of the physics of mechanical systems and mathematics by applying them in formulating solutions to common problems.

Identify and reflect upon the following aspects of personal development: strengths and weaknesses, motivations and values, ability to work with others.

Alternative Exit/ Interim Award Learning Outcomes - Diploma of Higher Education

A student who is eligible for this award will be able to:

Understand how materials, colour and texture are applied in creating a persuasive 3d rendered graphic presentation of a product

Create professional quality display models

Design and build remote intelligent systems

Ability to develop a branding strategy and promotional plan for a given product design.

Create 3D part models using surface modelling and other advanced modelling techniques.

Undertake finite element analysis of engineered components.

Generate an initial product design specification and select an optimal design from a range of design solutions.

Select appropriate standard items and select materials and their manufacturing processes to inform the final design

Develop detail design documents.

A student who successfully completes a placement year will be eligible for the Sandwich award and will, in addition to the above, be able to demonstrate the professional and personal skills necessary for effective employment within a professional environment.

Target award Learning Outcomes - Bachelor of Science with Honours

A student successfully completing the programme of study will have acquired subject knowledge and understanding as well as skills and other attributes.

Knowledge and understanding

A student who is eligible for this award will be able to:

A1. Maintain and extend a sound theoretical approach to the application of technology in engineering practice.

A2. Use a sound evidence-based approach to problem-solving and contribute to continuous improvement.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Acquisition of general and specialist engineering knowledge applied to existing and emerging technologies is achieved mainly through lectures and directed student-centred learning. Student-centred learning is used where appropriate resource material is available. Understanding is reinforced through case-studies and practical activities.

Assessment

Testing of the knowledge base is through a combination of unseen in-class tests, coursework in the form of case-study reports and coursework assignment submissions.

Skills and other attributes

Intellectual Skills

A student who is eligible for this award will be able to:

- B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks.
- B2. Contribute to the design and development of engineering solutions.
- B3. Implement design solutions and contribute to their evaluation.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Theoretical and practical methods are developed through lectures, case-studies and coursework assignments. Fundamental principles are delivered predominantly by lectures and laboratory classes. More advanced techniques such as computational techniques are delivered through examples, case studies and by project work supported by tutorials.

Assessment

Theoretical and practical methods are assessed through a combination of unseen in class tests, theoretical and practical coursework, laboratory work and project work.

Professional practical skills

A student who is eligible for this award will be able to:

- C1. Plan for effective project implementation.
- C2. Manage tasks, people and resources to plan and budget.
- C3. Manage teams and develop staff to meet changing technical and managerial needs.
- C4. Manage continuous quality improvement.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Technical and commercial skills are taught through individual and group project work supported by a lecture and seminar programme appropriate to the demands of the coursework and projects.

Assessment

Technical and commercial skills are assessed by individual and group written design project reports, student presentations with the aid of poster presentations, process books and display models and prototypes.

Transferable / key skills

A student who is eligible for this award will be able to:

- D1. Communicate in English with others at all levels.
- D2. Present and discuss proposals.
- D3. Demonstrate personal and social skills.
- D4. Comply with relevant codes of conduct
- D5. Manage and apply safe systems of work.
- D6. Undertake engineering activities in a way that contributes to sustainable development.

D7. Carry out and record CPD necessary to maintain and enhance competence in own area of practice.

D8. Exercise responsibilities in an ethical manner.

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated

Interpersonal and professional skills are embedded into almost every activity within the programmes content and assessment.

Assessment

Assessment of levels of interpersonal and professional skills is predominantly through individual and group academic and practical coursework and project work.

Programme structure - programme rules and modules

Programme rules

Students have the option to undertake a placement year. The placement year, module 5167PDE, will follow Level 5 and students will be enrolled on a 480 credit honours sandwich programme. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5. Students successfully completing the assessment of the placement year are eligible for a Sandwich award.

Students not undertaking a placement year are registered on the non-sandwich version of the programme and will have the opportunity of an additional study year abroad following Level 5. Students will be enrolled on a 480 credit honours with study abroad programme. Of those 480 credits, 120 will be taken via a Level 5 study abroad module 5168PDE. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5.

Level 6	Potential Awards on completion	Bachelor of Science with Honours
Core	Option	Award Requirements
6161PDE Project Management (20 credits) 6162PDE Major Project Research Report (20 credits) 6163PDE Major Project (40 credits) 6164PDE Sustainable & Ethical Design (20 credits) 6165PDE User Centred Design (20 credits)		120 core credits at level 6 0 option credits at level 6

Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5161PDE Advanced Computer Aided Modelling (20 credits) 5162PDE Product Design And Presentation (20 credits) 5163PDE Applied Electronics And Control (20 credits) 5164PDE Embodiment Design (20 credits) 5165PDE Product Analysis (20 credits) 5166PDE Digital Marketing & Business Model Development (20 credits)		120 core credits at level 5 0 option credits at level 5

Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4161PDE Computer Aided Modelling (20 credits) 4162PDE Design Visualisation (20 credits) 4163PDE Design Principles (20 credits) 4164PDE Introduction to Electronics		120 core credits at level 4 0 option credits at level 4

and Control (20 credits) 4165PDE Mechanics, Materials and Manufacture (20 credits) 4166PDE Model Making & Engineering Practice (20 credits)		
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Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.
<https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework>

Opportunities for work-related learning (location and nature of activities)

Students are encouraged and supported to find and undertake a year's industrial placement between Level 5 and Level 6. There is a further opportunity to undertake summer placements between academic years to gain valuable industrial experience. This work experience will help develop understanding of the world of work environment suitable for the programme and increase a student's professional practical skills. Additionally, the programme team have a track record of liaising with outside and industrial partners to provide students with "live" projects that are considered stretch goals for their academic development and learning. The student must pass a single, 120 credit module during the sandwich year.

Criteria for admission

A/AS Level

Applicants should have or expect to obtain a total of 112 UCAS points. At A2-level, applicants should expect to gain at least 64 UCAS points from Design Technology, Maths, Engineering, Chemistry, Physics or Electronics.

BTEC National Diploma

BTEC Extended Diploma.

Applicants should have or expect to obtain a total of 112 UCAS points (DMM), in a relevant subject.

Other

Applicants should have five GCSE (or equivalent) passes of at least grade C including Mathematics and English (or IELTS 6.0).

Mature entry

We welcome applications from highly motivated mature students with relevant experience but without the necessary formal qualifications. All applications will be considered on an individual basis.

Overseas qualifications

Applicants offering other awards will be considered on an individual basis in line with the agreed entry criteria.

External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA). Published review reports are available on the QAA website at www.qaa.ac.uk

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies (PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their personal and academic development. This includes support for placements and careers guidance.

- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

Methods for evaluating and improving the quality and standards of teaching and learning

Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

Please note:

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content, teaching, learning and assessment methods of each module can be found in module and programme guides.