BSc (Hons) Computer Aided Product Design

Programme Specification

Primary Purpose

Course management and quality assurance.

Secondary Purpose

Detailed information for students, staff and employers. Current students should refer to the related Course Handbook for further detail.

Disclaimer

The University of Portsmouth has checked the information given in this Programme Specification Supplement. We will endeavour to deliver the course in keeping with this Programme Specification Supplement; however, changes may sometimes be required arising from annual monitoring, student feedback, review and update of units and courses. Where this activity leads to significant changes to units and courses, there will be prior consultation of students and others, wherever possible, and the University will take all reasonable steps to minimize disruption to students. It is also possible that the University may not be able to offer a unit or course for reasons outside of its control, for example; the absence of a member of staff or low student registration numbers. Where this is the case, the University will endeavour to inform applicants and students as soon as possible. Where appropriate, the University will facilitate the transfer of affected students to another suitable course.

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Course Details

1. Named Awards

BSc (Hons) Computer Aided Product Design

2. Course Code (and UCAS Code if applicable)

C1067S

3. Awarding Body

University of Portsmouth

4. Teaching Institution

University of Portsmouth

5. Accrediting Body

The course is accredited by the Institution of Engineering Designers and the Institution of Mechanical Engineers (the latter for incorporated engineer status).

6. QAA Benchmark Groups

Engineering, Art and Design

7. Document Control Information

Release 6.4 – modifications for 2016/17

Release 6.5 – modifications for 2017/18

8. Effective Session

2017/2018

9. Author

Dr Andrew Little

10. Faculty

Technology

11. Department

School of Engineering

Curriculum

12. Educational Aims

The aim of the course is to provide a broad education and to prepare the student for a career involved with the design and creation of industrially manufactured products, with particular emphasis on the uses of computers within the process of design and manufacture. The educational experience will encompass the integration of the technological, visual, human, market and social

aspects to develop creativity, knowledge understanding as well as skills required by product designers.

In addition, and more generally, the course aims to:

- Provide a challenging and stimulating study environment.
- Enable students to broaden their studies by including study units from outside their discipline as substitutes for degree option choices.
- Develop a range of keys skill by means of opportunities provided in the study units.
- Accommodate student needs in relation to maximising their career potential by enabling them to develop knowledge, understanding and skills in their chosen subject area.
- Promote career aspirations by including study topics on general professional practice and study skills.

13. Reference Points

The major reference points are the University of Portsmouth undergraduate curriculum, the QAA subject benchmark statements for Engineering and for Art and Design, the National Qualification Framework and the QAA UK Quality Code for Higher Education.

- **Mathematics**: Students will achieve an appropriate level of competence in relevant mathematical methods and will use these skills in analysing problems.
- **Science**: Students will be introduced to the broad principles of physical laws to enable preliminary calculations to be undertaken. Knowledge to be of sufficient depth to allow sensible liaison with specific technical specialists.
- **Information Technology**: Students will be introduced to a number of industry standard software tools and packages. They will gain the ability to select and apply appropriate computer based methods for modelling and analysing problems this will include the use of an industry standard CADCAM system.
- **Design**: Students will gain knowledge and understanding of the design process and structured approaches to problem solving. They will have a good knowledge of relevant materials. They will be encouraged to develop their creativity leading to innovative products.
- **Business context**: Students will gain knowledge and understanding of management and business practices applied to product design business. They will be encouraged to develop their communication and study skills, leading to the ability to undertake lifelong learning. Team working skills will be nurtured.
- **Product Design Practice**: Students will gain knowledge and understanding of standards for managing Product Design, codes of practice and the regulatory framework. Able to undertake risk assessment based on a mix of technical and commercial issues.

14. General Learning Outcomes

Level 4

Certificates of Higher Education are awarded to students who have demonstrated:

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

Typically, holders of the qualification will be able to:

- evaluate the appropriateness of different approaches to solving problems related to their area(s) of study and/or work
- communicate the results of their study/work accurately and reliably, and with structured and coherent arguments
- undertake further training and develop new skills within a structured and managed environment

And holders will have:

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

Level 5

Diplomas in Higher Education are awarded to students who have demonstrated:

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

Typically, holders of the qualification will be able to:

- use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis
- 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
- undertake further training, develop existing skills and acquire new competences that will enable them to assume significant responsibility within organisations

And holders will have:

- the qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and decision-making

Level 6

Bachelor's with honours degrees are awarded to students who have demonstrated:

- a systematic understanding of key aspects of their field of study, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of defined aspects of a discipline
- an ability to deploy accurately established techniques of analysis and enquiry within a discipline
- conceptual understanding that enables the student:
    - to devise and sustain arguments, and/or to solve problems, using ideas and techniques, some of which are at the forefront of a discipline
    - to describe and comment upon particular aspects of current research, or equivalent advanced scholarship, in the discipline
- an appreciation of the uncertainty, ambiguity and limits of knowledge
- the ability to manage their own learning, and to make use of scholarly reviews and primary sources (for example, refereed research articles and/or original materials appropriate to the discipline)

Typically, holders of the qualification will be able to:

- apply the methods and techniques that they have learned to review, consolidate, extend and apply their knowledge and understanding, and to initiate and carry out projects
- critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution - or identify a range of solutions - to a problem
- communicate information, ideas, problems and solutions to both specialist and non-specialist audiences

And holders will have:

- the qualities and transferable skills necessary for employment requiring:
  - the exercise of initiative and personal responsibility
  - decision-making in complex and unpredictable contexts
- the learning ability needed to undertake appropriate further training of a professional or equivalent nature

15. Learning Outcomes

A. Knowledge and Understanding of:

A.1 Aesthetics, evolution of style and the use of material, colour, texture and proportion (PDP).
A.2 The selection of materials and manufacturing processes based on specified requirements.
A.3 The design process and its influence on sustainability and the manufacturing process for defined artefacts.
A.4 Physical constraints as they affect the design and manufacture of a product.
A.5 The importance of commerce, ethics and codes of practice and the environment in the design of commercial products
A.6 Software functionality in product design.

B. Cognitive (Intellectual or Thinking) Skills, able to:

B.1 Apply problem solving processes to develop solutions.
B.2 Apply knowledge gained to the solution of problems.
B.3 Research and acquire increased personal knowledge base.
B.4 Anticipate and accommodate change, and work within contexts of ambiguity, uncertainty and unfamiliarity.
B.5 Source and research relevant material, assimilating and articulating relevant findings.

C. Practical (Professional or Subject) Skills, able to:

C.1 Present design ideas in a professional manner using manual and other technical visualisation techniques.
C.2 Plan, organise and practice design in a professional manner.
C.3 Think creatively in order to develop design and analytical solutions.
C.4 Manage project based work using appropriate tools.

D. Transferable (Graduate and Employability) Skills, able to:

D.1 Communicate effectively using graphical, written and other viable means of communication.
D.2 Read and understand complex documents related to technological products and requirements.
D.3 Use IT to handle data, simulation and assist with design and testing.
D.4 Deal with numerical data as might be found in typical technological oriented situations.
D.5 Assess problem domains and formulate appropriate problem solving strategies.
D.6 Build on previous experience in order to generalise ideas and skills.
D.7 Work in teams to achieve goals but nevertheless be distinctively individual.

16. Learning and Teaching Strategies and Methods

Core knowledge is acquired through a combination of lectures, tutorials and practical laboratory work. Individual learning is supported by directed reading, study guides, tutorial and worked examples. Additionally design exercises will be used to allow students to gain skills in product development.

Intellectual aspects are introduced in Year 1 and developed in Years 2 and 3 taught through a series of lectures, tutorials and laboratory work. Students learn from carrying out assignments, responding to design briefs, taking the various in-class tests, carrying out the laboratory work and from the valuable feedback received on their work.

Skills are developed throughout the course from the continuously assessed activities supported by frequent feedback. All skills are developed through a series of course works (group and individual), presentations and project work throughout the programme.

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17. Assessment Strategy

Testing of theoretical knowledge is largely through examinations offered in several styles, by continuous assessments as well as through laboratory exercises.

Skills are assessed through written examinations and project work. Additionally course works, project work, reports, presentations and oral examinations are used where appropriate.

These are assessed by means of laboratory reports, project reports, course work submission and presentations.

Skills are assessed through course work and presentations and some by examinations. The majority of these skills are assessed as part of project activities.

18. Course Structure, Progression and Award Requirements

See Unit Web Search[1] for full details on the course structure and units

Computer Aided Product Design is a 3 year full-time or 4 year sandwich course, which runs in parallel with other Product Design courses within the School of Engineering. The emphasis is on the use of the use of computers within the design process.

The course comprises lectures, tutorials, seminars, experimental work and design projects. It makes extensive use of the School's computer suites and laboratories. Whilst the majority of units have a focus on Design and related studies, topics such as Technology Concepts and Communications and Business, develop skills that prepare students for their first appointment in the world of work. This is augmented by use of group working throughout the course.

The course consists of 20-credit taught units, where each year consists of 120 credits. A 20-credit unit is expected to require 200 hours of total study of which 48 hours would typically consist of lectures and there would be additional practical work. At the end of the course there is a 40-credit Individual Project. Scheduled small group tutorials ensure that contact is maintained between students and their personal tutors.

The course as a whole is highly career-focused, with the content designed to develop the necessary analytical and design skills required for Product Designers. Practical work uses hardware and software systems that are widely used in industry and this familiarity eases the transfer of graduates into employment. The content of the course is periodically discussed with our Industrial Advisory Board. The School has an Industrial Liaison Officer whose particular role is to maintain contact with employers, although most staff maintain good industrial and research links. The industrial placement, which is usually taken between the second and final year of a sandwich course is strongly recommended (but not compulsory). The latter often makes use of the School's exchange arrangements, which enables overseas industrial and academic placements to be made available.

19. Employability Statement

The School of Engineering has links with over 250 employers and alumni, who have contributed to the formulation of the Product and Industrial Design courses. The School's Industrial Advisory Board meets regularly throughout the year and that is kept up-to-date with the progress of courses. This forum provides valuable feedback to the School on many aspects, including employability of graduates and work placement students.

[1] www.port.ac.uk/unitwebsearch

Year-long work placements with suitable companies are arranged via the Faculty of Technology Student Placement and Employability Centre (SPEC) and via the “Purple Door”. There are also many international and national opportunities available.

Students have the opportunity to undertake foreign languages via elective units as a part of the assessed section of their degree, or to lean a language for fun. This improves employment potential with companies abroad, as well as companies involved with international customers and/or suppliers. It is a requirement for overseas placements that a competent level in the language is obtained prior to leaving the UK.

While studying, Personal Development Planning including the identification and review of skills (at all levels of study) is provided via the Personal Tutor system, using centrally produced materials and professional portfolios during industrial placements.

The Product Design and the Industrial Design courses are accredited by the IED (RProdDes) and the IMechE (IEng), as a result, our students can become student members of either or both institutions, currently at no cost. This means that they have the full benefits of institution membership, including access to professional magazines and websites, and including professional employment opportunities. Accreditation is a further benefit when students apply for jobs, in that employers have a better understanding of the aims of the course, and the value added to graduates of that course. In addition, graduates from an accredited course have the benefit of the “fast track” to full membership, with the consequent enhancing of the employability our graduates.

University Wide Electives, work-based learning units and particular “employability units” form part of the Product Design degree programme. Students can experience community engagement from many of the electives on offer.

Career Management Skills are embedded in curriculum, either via electives or core units where students learn highly valued technical skills and more general key skills such as career decision making and strategies for self presentation. Business, enterprise, marketing, and management are elements of the curriculum that develop skills of entrepreneurship.

Course Management

20. Support for Student Learning

- The Course is managed by a Course Leader.
- Extensive induction programme introduces the student to the University and their course.
- Each student has a personal tutor, responsible for pastoral support and guidance.
- University support services include careers, financial advice, housing, counselling etc.
- The Academic Skills Unit (ASK).
- The Additional Support and Disability Advice Centre (ASDAC).
- Excellent library facilities.
- The University of Portsmouth has consistently been awarded an excellent rating for student support and guidance in a number of Quality Assurance Agency inspections.
- Student course and unit handbooks provide information about the course structure and University regulations etc.
- Feedback is provided for all assessments.
- Personal Development Planning (PDP) for all awards.

21. Admissions Criteria

A. Academic Admissions Criteria

Standard University rules apply plus:

- 96-120 points to include a minimum of 2 A levels (or equivalent) to include two relevant subjects (Science, Technology or Design).
- Minimum of GCSE Grade C (or equivalent) in Mathematics and Physics/Combined Science.
- Applicants may be requested to provide a portfolio to support their application.
- Entry can also be by successful completion of the School's Extended Engineering (Foundation) route.
- All other qualifications will be considered by the Admission Tutor and/or Course Leader.

B. Disability

The University makes no distinction in its admissions policy with regard to disability and will endeavour to make all reasonable adjustments in order to make it possible for students to study at Portsmouth on a course of their choice.

22. Evaluation and Enhancement of Standards and Quality in Learning and Teaching

A. Mechanisms for Review and Evaluation

- Course Leader's Annual Standards and Quality Evaluative Review.
- Head of School's Annual Standards and Quality Evaluative Review.
- Unit and Course Level student feedback considered at Board of Studies.
- Unit Assessment Board consideration of student performance for each programme.
- Annual Standards and Quality Reports to Board of Studies, including consideration of Subject and Award External Examiner Reports.
- Periodic Programme Review.
- Student Representatives and Student/Staff Consultative Committees.
- National Student Survey.
- Staff Performance and Development Review.
- Peer Review and Development Framework.
- Faculty Learning and Teaching Committee.

B. Responsibilities for Monitoring and Evaluation

- Unit Co-ordinators for unit content and delivery.
- Course Leader for day-to-day running of course.
- Board of Studies with overall responsibilities for operation and content of course.
- Head of School.
- Associate Dean (Academic).
- Associate Dean (Students).
- Quality Assurance Committee.
- Unit, Award and Progression Board of Examiners.

C. Mechanisms for Gaining Student Feedback

- Student Representation on Board of Studies.
- Student Staff Consultative Committees.
- Unit and Course level student feedback questionnaires.
- University participates in external student surveys, eg the National Student Survey (NSS) and the International Student Barometer (ISB).

D. Staff Development Priorities

- Academic staff undertake activities related to research, scholarship, teaching and learning and student support and guidance.
- Annual staff performance and development reviews match development to needs.
- Managers undertake a variety of management development programmes.
- All academic staff are encouraged to seek Higher Education Academy membership.
- Academic staff new to teaching are required to undertake Initial Professional Development Programme (iPROF).
- Support Staff are encouraged to attend short courses in areas such as minute taking, and specific IT packages.

23. Assessment Regulations

The current University of Portsmouth academic regulations will apply to this programme (*see Assessment and Regulations*[2]).

24. Role of Externals

Subject External Examiners who will:

- Oversee unit assessment and usually attend Unit Assessment Boards
- Review unit assessment strategy
- Sample assessment artefacts
- Present report to Unit Assessment Boards

Award External Examiners (usually also a Subject External Examiner) who will:

- Oversee and attend Award/Progression Boards
- Scrutinise and endorse the outcomes of assessment
- Ensure that the standard of the award is maintained at a level comparable with that of similar awards elsewhere in the United Kingdom

25. Indicators of Standards and Quality

A. Professional Accreditation/Recognition

This course has been accredited as fulfilling the requirements for membership of the Institution of Engineering Designers (RProdDes). It has also been accredited by the Institution of Mechanical Engineers for Incorporated Engineer status (IEng). Accreditation ensures that the course maintains its academic relevance and enhances the value of your course to subsequent employers.

B. Periodic Programme Review (or equivalent)

Successful Periodic Programme Review 12th March 2013, confirming both fitness of purpose of curriculum and effectiveness of annual monitoring and review processes.

C. Quality Assurance Agency

QAA Higher Education Review, March 2015, judgements about standards and quality meet UK expectations (*for full report see Higher Education Review of the University of Portsmouth, March 2015*[3]).

[2] www.port.ac.uk/departments/services/academicregistry/qualitymanagementdivision/assessmentandregulations/

[3] www.qaa.ac.uk/en/ReviewsAndReports/Documents/University%20of%20Portsmouth/University-of-Portsmouth-HER-15.pdf

D. Others

Highlights of the 2014 REF (Research Excellence Framework) include:

- Ranked third overall out of new universities submitted in this Unit.
- 61% of our research outputs were rated as either world-leading or internationally excellent.
- 50% of our research overall was rated as either world leading or internationally excellent.
- 50% of our impact was rated as having very considerable reach and significance.

The School of Engineering has also recently gained SRIF and HEIF awards and is also a long-standing Regional Centre for Manufacturing Industries.

The University has recently been awarded the maximum £5m by the Higher Education Funding Council for England (HEFCE) towards a new, cutting edge Technology Centre and the University is contribute a further £6m to establish a Future Technology Centre (FTC). This will provide leading-edge simulation, visualisation, modelling and prototyping resources to encourage high-level skills development by students.

26. Further Information

Further information may be found in:

- Student Handbook
- University of Portsmouth Curriculum Framework Document
- University of Portsmouth Prospectus
- University of Portsmouth[4] and School/Department[5] websites

[4] www.port.ac.uk/

[5] http://www.port.ac.uk/school-of-engineering/