

technology innovation centre

Postgraduate Programme

**Programme Specification including
Student Guide and Employer Guide**

MSc Engineering Product Design

Date of Course Approval/Review	Current Version Number	Version Date
16 September 2004	1.04	5 June 2006



Definitive Documents and Version Control

This document has a version number and reference date in the footer. The process leading to introduction of new courses, and major changes to courses follows tic procedure QA 1 and culminates in approval by the University's Senate.

The process leading to introduction of minor changes to modules and courses follows tic procedure QA 5 and culminates in approval by the Dean.

The reference date will be that of the approval event, minor changes board, or other meeting at which formal consideration was given.

Further details about the course and document development may be obtained from minutes of the approval meeting, or minor changes board. A history of the document is summarised in the table below and further information relating to past versions can be obtained from the tic Registry.

MSc Engineering Product Design Programme Specification, Student and Employer Guides			
Version	Event	Date of event	Authorised by
1.01	Approval	16 September 2004	Dean of Faculty
1.02	Approval (conditions)	16 September 2004	Panel Chair
1.03	Change to UCE logo and Standard Postgraduate Assessment Regulations	13 September 2005	Programme Manager
1.04	Minor Changes Combined Board of Studies	5 June 2006	Dean of Faculty

PROGRAMME SPECIFICATION

MSc Engineering Product Design

NOTE: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes advantage of the learning opportunities that are provided. More detail on the specific learning outcomes, indicative content and the teaching, learning and assessment methods of each module can be found (1) at <http://web.tic.ac.uk>, (2) in the Theme Book, and (3) in the Student Handbook. The accuracy of the information contained in this document is reviewed by the University and may be checked within independent review processes undertaken by the Quality Assurance Agency.

The information from this specification may be selectively extracted and included in documents that are more appropriate for students, intending students and employers.

1	Awarding Institution / Body:	University of Central England
2	Teaching Institution:	Technology Innovation Centre, University of Central England
3	Programme accredited by:	N/A
4	Final Award:	MSc
5	Programme Title:	Engineering Product Design
6	UCAS Code:	N/A
7	QAA Benchmarking Group:	N/A

8 Aims of the programme

Overall the course aims to produce skilled engineering product design engineers who can provide creative input to engineering programmes, utilising the latest digital systems and processes. The course will encourage creative engineering work by providing space for teamworking, discussion and peer review. This peer review is an integral part of learning process in this subject area and is an integral part of the learning which takes place in each of the themes within this course. This peer review also provides a degree of uniqueness to the course as it reflects the nature of employment in this field.

The programme aims to provide learners with:

- An opportunity to participate in peer review activities, which are encouraged as a means of formative assessment, using methods such as De Bono's Six Hats. This will ensure students can review each others' work without feeling uncomfortable.
- a course intended to bridge the gap between Engineering and Design, an area of industry that has long suffered from misunderstanding and poor communication. It aspires to develop a culture where art and science coexist in an environment where solutions are developed to enhance the quality of human life.
- a course of study that will extend them intellectually and practically according to their abilities and to provide the opportunity to allow students to reflect on their learning.

- the skills to respond to the market need for Engineering Product Designers, competent and skilled in the use of computer 3D surface modelling,
- visualisation and appropriate simulation and virtual testing techniques.

- an opportunity appraise the significance of the digital design asset, by gaining experience in using leading edge digital development design tools.
- a knowledge and full understand the breadth of capability in the latest software tools for facilitating multi-site project communication and knowledge based engineering.
- an opportunity to demonstrate their skills as one of a new generation of engineering product designers, with a wider, more creative, more flexible skill set, including a good understanding of real customer values.
- the skills required to design, develop and analyse concepts within a business product design environment.
- a strong business appreciation of how to deliver maximum customer value at minimum cost.
- the skills and knowledge of how new and emerging technologies, processes and production methods, and how to capitalise on them.
- skills to enable active and autonomous learning to be developed through the use of real design engineering problems and case study materials.
- design engineering skills including problem-solving abilities, practical competencies, critical appraisal and communication skills.
- opportunities to demonstrate their understanding through a variety of methods, both traditional and new.
- project management and interpersonal skills to liaise and work in project teams, structuring their work and meeting the varying demands placed on them; as they would in the work place.
- a course with an emphasis on active and participative education, including learning by doing, problem based learning and group work which will develop their skills of analysis, synthesis, decision making and the ability to cope with new and unfamiliar problems.
- An opportunity to relate practical real life problem based learning to industry and commerce, then to apply new technologies and techniques to solve present and future problems, not only in the UK but abroad.
- skills to critically appraise current designs, and appreciate detailed component features and manufacturing techniques.
- skills to appraise the business/market context of design, including market research methods including the way that markets are changing due to demographic and cultural pressures.

- skills in the use of techniques to evaluate the use of appropriate design methodologies in product design, and demonstrate an ability to apply the procedures appropriately.
- skills to interpret the effect on design of constantly increasing legislative controls world-wide, covering particularly Safety and Environmental issues.
- techniques to evaluate how knowledge of futurology coupled with new materials and manufacture can be used to develop future products beyond current limitations.
- skills to appraise the various aspects of Human Factors and their use within the product development process.
- techniques to examine appropriate methods to the analysis of human factors with regard to product operation.
- knowledge to interpret the human body as a biomechanical system and understand its potential output and fatigue.
- An understanding of the historical and social context of industrial design and its impact on business and society.
- knowledge of techniques to plan and manage the project in order to achieve the specified objectives.
- skills to evaluate the results and recommendations made and to communicate these clearly in writing, visually and orally.

9 Intended learning outcomes and the means by which they are achieved and demonstrated: the programme provides learners with opportunities to develop and demonstrate knowledge and understanding, skills and other attributes as follows:

Knowledge and understanding

Knowledge and understanding of:	Teaching, learning and assessment methods used:
<p>A defined body of knowledge, skills and understanding and analyse its relationships with conceptual frameworks and, where appropriate, professional practice in industry and commerce.</p> <p>To develop skills of analysis, synthesis, decision making and the ability to cope with unfamiliar problems.</p> <p>To develop design skills in the areas of creativity, design practice, design methodologies, critical evaluation of customer requirements and design briefs.</p>	<p>Face-to-face traditional lecture, seminar, tutorial, self study and design studio based peer review sessions.</p> <p>Directed independent learning activities are encouraged at all stages of the course.</p> <p>However there is a major emphasis on hands-on and practical learning within the studio environment to re-enforce the theory material, both supervised and unsupervised.</p> <p>Knowledge and understanding are acquired through rich media web based curricula and computer simulations.</p> <p>Knowledge and competence assessment is performed by tutors and peers, this both formative and summative. This includes seminars, viva-voce, coursework, practical case studies, theory projects, time constrained examinations, and practical assessments.</p>

Skills and other attributes

Intellectual / cognitive skills:

Analysis of customer related issues and the ability to design and implement solutions based on user requirements and specification.

Argue rationally and draw independent conclusions based on a rigorous, analytical and critical approach to demonstration and argument.

Synthesise theory and practice to design/implement a range of solutions.

Assess and resolve competing issues such and resources.

Write fully researched and referenced technical reports, which evaluate both technical and management issue. This will involve the use of a variety of IT tools.

Demonstrate, in an analysis of a specified problem, a high level of competence and understanding of the data manipulation, information presentation and delivery.

Apply new technologies and techniques to solve present and future industrial and commercial problems nationally and internationally.

Teaching, learning and assessment methods used:

Intellectual skills are developed through teaching and learning programme previously outlined.

Analytical and problem solving skills are further developed using a range of appropriate 'real' and 'theoretical' case-studies and problem based learning scenarios.

The course comprises 4 themes, all requiring an element of written work, which will demonstrate the students' ability to apply the knowledge gained to a specific problem.

Each Theme attracts 27 credits with a notional 270 hours. The theme will normally have up to 3 elements of assessment.

The formative assessments are to be used to monitor progress and to feed this progress back to the student.

Assessment can include practical work, individual written coursework, group presentations, viva voce, individual and group reports, practical assessments, closed and open book time constrained examinations.

Practical, research and independent learning skills:

Access information from the internet, journals, books, research papers and appraise its suitability for at a master's level research.

To demonstrate the ability to work autonomously or in a group and accept responsibility for the action taken.

Reflect on personal practice, attributes, both learning and doing. If required and modify learning approach to maximise learning opportunities.

Interpret and critically evaluate knowledge, concepts and ideas and/or forms of creative expression, to deliver a quality product or service.

Comprehend and solve mathematical or analytical problems at a level required by the chosen course of study.

Demonstrate the knowledge and skills outlined within the PSDU and PPDU Learning Outcomes.

Apply the knowledge, skills and methodologies of design to the analysis and solution of complex problems or to the expression of sophisticated creative solutions.

Possess a defined body of knowledge, skills and understanding and analyse its relationships with conceptual frameworks and, where appropriate, professional practice.

Develop design focussed skills in the areas of creativity, aesthetic appreciation, and the relationship between product

Teaching, learning and assessment methods used:

The acquisition of appropriate and transferable practical skills is central to the learning strategy of the programmes

Initiative and independence are fostered throughout, and develop incrementally as the course progresses.

Emphasis is placed on guided, self-directed and student-centred learning, with increasing independence of approach, thought and process. This independent learning will undergo a process of peer review in order to evaluate the effectiveness of the learning.

Learners are encouraged to plan their own work schedules and are required to meet strict deadlines.

Learners are required to plan and execute a related dissertation.

The **Postgraduate Study Development Unit** provides the vehicle for the development learning skill developments. The PSDU, which is of 60-hours duration comprises:

Learning Review- The Postgraduate Learning Review will be started during the Postgraduate Study Development Unit and completed to Stage 1. Assessment of Stage 1 will take place at the end of the PSDU.

Learning, Research and ICT skills development- Report writing skills, Information skills, IT skills, Basic mathematical / statistical skills, Oral presentation, Time management, CV preparation.

PSDU Assessment includes a variety of competence based formative and summative assessment including interview, preparation of a formal written report, an oral presentation, group activity and the production of an electronic presentation.

<p>design and society</p>	<p>The Postgraduate Project Development Unit focuses on the identification of a potential Master's project. The PPDU , which is of 60-hours duration comprises:</p> <p>Learning Review- The Postgraduate Learning Review will be completed up to stage 2 and reviewed as part of the assessment of the PPDU.</p> <p>Research and Report writing skills: Types and structure of reports (essays/technical reports/conference papers/executive summaries). Stages of report generation. Reference lists and Bibliographies.</p> <p>Primary and Secondary Research Methodologies.</p> <p>Time management: Analysing weekly schedule. Planning activities. Background/easy/difficult tasks, prioritising.</p>
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Transferable / key skills:	Teaching, learning and assessment methods used:
Elicit the co-operation of others and contribute to team goals	<p>Transferable/key skills are core to the learning strategy of the programme. They are pervasive, and are incorporated into work units and assessments as appropriate, for example; team-working skills are fostered through the use of group, task-based practical projects.</p> <p>Keeping logbooks and submitting self-assessment documentation in support of personal performance fosters reflection and self awareness.</p> <p>The use of information technology plays an active role throughout the course. The support materials are available through the URLs provided on the theme, work unit and module guides.</p> <p>A full range of resources are identified including books, journals as well as locally created material.</p> <p>Assessment methods include seminars, viva-voce, coursework, practical projects, theory projects, timed examinations and practical assessments.</p>
Manage time and prioritise workloads	
Make effective oral and written presentations which are coherent and comprehensible to others	
Access and make appropriate use of relevant mathematical and theoretical data analysis.	
Use various forms of communication and expression, then to employ them selectively, appropriately and effectively according to the requirements of the solution.	
Plan and deliver an oral presentation, including Viva-Voce, lead discussion and facilitate arguments, in an eloquent and professional manner, making use of a computer-based presentation aids, where necessary.	
Understand career opportunities and begin to plan a career path, including obtaining placement opportunities.	
Show confidence and self-awareness, reflect on own learning, and be self-reliant and constructively self-critical.	
Ability to communicate and present information visually	
Ability to instigate and develop innovative ideas	

10 Programme structure and requirements, levels, modules, credits and awards

The MSc programme is normally studied over one year full-time or two years part-time, and students may if they wish move between full- and part-time modes of attendance. The academic year is divided into semesters of approximately 14 weeks each, which run from September to January and January to June. The course is divided into 7 distinct study units, a Postgraduate Study Development Unit (6 Credits at level 7), a Postgraduate Project Development Unit (6 Credits), four themes, (27 credits) and a Master's project (60 credits). Students complete 60 credits at the Postgraduate Certificate stage, 120 credits at the Postgraduate Diploma stage and 180 credits at the MSc stage. Each credit represents 10 hours of student learning and assessment.

The structure of the course, the theme, levels and credit ratings and the awards that can be gained are shown below. Personal Development Planning is an integral part of the learning process of each element of the course.

Stage 1

Element name	Credit
POSTGRADUATE STUDY DEVELOPMENT UNIT (PSDU)	6
<p>Learning Review- The Postgraduate Learning Review will be started during the Postgraduate Study Development Unit and completed to Stage 1. Assessment of Stage 1 will take place at the end of the PSDU.</p> <p>Learning, Research and ICT skills development- Report writing skills, Information skills, IT skills, Basic mathematical / statistical skills, Oral presentation, Time management, CV preparation.</p>	
DIGITAL DESIGN	27
<p>Digital Design deals with digital technologies, processes and applications. This area is related to all the others as it is the communication framework around which other work is developed and presented and becomes the platform on which to develop the masters project.</p> <p>Design Process Design Specification to provide a basis for design activities, The 2D, sketch visualisation, stage –creative ideation & exploration, Criteria based Design Review and Filtering to select route for 3D development, 3D Modelling design and development activities, Design and Modelling techniques, network inputs and outputs, Engineering feasibility inputs and outputs & communication tools, Requirement for physical models to fully understand and verify design.</p> <p>Digital Systems & Communication This unit encompasses an overview of the major digital design / engineering systems and associated virtual testing regimes. The topics covered include:- Virtual prototyping – range of possibilities, purpose, Finite Element</p>	

Analysis, Chassis systems and kinetic modelling, Aerodynamics and CFD, Thermodynamic requirements, Process modelling, Communication tools.

3D CAD Modelling Systems

Transfer from 2D Sketches, Construction of Block Surfaces, Construction of Swept and Lofted Surfaces, Analysis of Surface Integrity, Surface Rendering, Constructing Complex Assemblies, Analysing Assembly Motion and Component Clash. **Visualisation Techniques** - Scene-building, Setting up of Model inc. Lighting, Background etc, Ray-Tracing , Surface Quality Analysis Techniques

DESIGN IN BUSINESS

27

Design in Business looks at how design interacts with and affects industry, specifically understanding the marketplace, managing work of this nature and protecting intellectual property. Each of these subject areas have their own place within the design process and will be incorporated into the masters project.

Design for Market

Quality Functional Deployment (QFD) , Market Research Methods, Marketing Strategies & Psychology, Brand Identity & Management, Financial Constraints, Global Business Environment & Changing Markets

Managing Innovation

Clear Definition of Indicative Design Activities at each Stage of the Process, Innovation Techniques, Design Assessment and Improvement Procedure, Idea Management, Managing Risk, Contextual Value and Sustainable Thinking

Design Legislation

Legislation in the automotive industry (e.g. EU and World Product/Vehicle Safety Criteria, EU and World Pedestrian Safety Criteria, EU and World Vehicle Lighting Legislation), EU and World Environmental Protection Legislation, Other Pertinent Legislative Criteria, Intellectual Property Rights, Product liability e.g. Consumer Protection Act, British standards

Award: Postgraduate Certificate (60 credits)

Stage 2

Element name	Credits
<p>POSTGRADUATE PROJECT DEVELOPMENT UNIT (PPDU)</p> <p>Learning Review- The Postgraduate Learning Review will be completed up to stage 2 and reviewed as part of the assessment of the PPDU.</p> <p>Research and Report writing skills: Types and structure of reports (essays/technical reports/conference papers/executive summaries). Stages of report generation. Reference lists and Bibliographies.</p>	<p>6</p>

Primary and Secondary Research Methodologies.

Time management: Analysing weekly schedule. Planning activities. Background/easy/difficult tasks, prioritising.

PRODUCT DESIGN

27

Product Design allows students to gain deep knowledge of the interaction between humans and products, including use of calculative techniques to analyse and predict responses and outputs. It also explores the social and cultural aspects of product development. These building blocks form the heart of the course as they deal with human – machine interaction and allow students to form product concepts with an understanding of user need and perception.

Human Factors

The human as a system component, Psychology and Physiology of vision and hearing, The human motor system, The Psychology of attention, visual perception and memory. Cognition, Ergonomics and human limitations. Layout, workspace and anthropometrics, Models of work, Ergonomics and the Psychology of work, The concept of cognitive overload; errors, failures and human reliability. Current models and approaches.

Ergonomic Biomechanics

Human factors engineering fundamentals, Human systems design and development, Biostatic and biodynamic mechanics, Biothermodynamics, Ergonomic biodynamics, Quantitative workload analysis, Neuromuscular control systems, Human operator control.

Design in Practice

Design and engineering design historical studies, Contemporary practice and future developments, Political, legislative and environmental influences, The business context, The nature and aesthetics of design, Creative thinking and associated techniques, The management of innovation.

27

DESIGN FOR THE FUTURE

Design for the Future develops an understanding of cutting edge technologies and the implementation of new technologies, social and cultural trends that will occur in the future. This has a relationship with business in developing future corporate strategies and with the human centred content as it enables designers to predict the social and cultural impact of these technologies.

New materials and their Applications

New Materials, Surface Engineering, Lightweight materials, Polymers, Ceramics, Metals, New concepts – nanomaterials, smart materials, biomimetics, Materials selection.

<p>Advanced Manufacturing Processes Near net shape manufacturing techniques, Control of processes to produce specific material structures, Developments in metal processing techniques, Polymer processing, Ceramics processing – sintering, HIPping, Precision manufacturing, Concurrent engineering vs. traditional design, CE enabling technologies, Manual DFA, value engineering, DFX, time compression technologies, quality assurance.</p> <p>Futurology The history of technological development, Potential new technological developments, Effects of climate change, Futurology state-of-the-art and its current role, Linear and non-linear extrapolation, Trends analysis & scenario building, Emerging materials and manufacturing techniques, New product development.</p>	
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Award: Postgraduate Diploma (120 credits)

Stage 3

Element name	Credit
<p>Master's Project - The project is the ultimate test of the student's ability to integrate and synthesise what has been learnt on the course. It provides an opportunity to apply knowledge gained to a substantial problem.</p>	<p>60</p>

Award: MSc (180 credits)

MSc Engineering Product Design Structure

MSc 180 Credits

Master's Project
including Project Proposal and Research Plan and the write-up
600 hours at Level 7 (30 weeks)

PgD 120 Credits

Product Design
27 Credits 270 Hours

Design for the Future
27 Credits 270 Hours

PPDU (2 weeks) Preparation for the project – Deliverable 2000 report outlining the proposed area of research for the Master's Project the student would wish to undertake plus the Learning Review to stage 2 - 6 Credits 60 Hours

PgC 60 Credits

Digital Design
27 Credits 270 Hours

Design in Business
27 Credits 270 Hours

PSDU (2 weeks) Learning Skills Development – Deliverable 2000 word report and presentation related to the specific course being undertaken along with a Learning Review to stage 1 - 6 Credits 60 Hours

11 Support for Learning

Students are encouraged to identify and, with guidance, to reflect on their own learning needs and are offered the following support as appropriate to those needs:

A 60 hour PSDU that includes a review and assessment of the fundamental requirements of the study.

A 60 hour PPDU that focuses on the requirements for the Master's project.

A fully resourced Learning Centre.

A student handbook containing information relating to the University, TIC and the themes of study.

A virtual learning environment to support students remotely via collaborative tools and technologies.

Access to teaching, support and management staff.

Postgraduate website accessed through TIC intranet.

Access to TIC and UCE resources seven days per week e.g. Library, eLearning materials – outside normal class times.

Access to student services, including Students Union.

12 Criteria for admission

Candidates must satisfy the general admissions requirements of the programme, which are as follows:

Minimum 2(ii) Honours degree from a UK University or equivalent in a relevant subject.

Alternative Entry Routes

Students who do not hold the standard entry requirements may be considered for admission provided they can satisfy the Course Director and relevant Theme tutors that their qualifications and/or industrial experience are equivalent to that attained through the completion of an appropriate honours degree programme.

13 Evaluation and improvement of quality and standards

Committees:

Course Committee
Board of Studies
Examination Board
Learning Management Committee (LMC)
Learning Quality Committee (LQC)
Faculty Board
Academic Quality and Support

Mechanisms for review and evaluation:

Review and validation events
Annual Monitoring
Student feedback questionnaires
Annual staff appraisal
External Examiners' Reports
Course team meetings and Away Days

14 Regulation of assessment

Students are issued with copies of the University's Standard Postgraduate Assessment Regulations on commencing the course, and individual and collective guidance is given by academic staff on their operation at appropriate times throughout the course.

Standard Postgraduate Assessment Regulations have been reviewed and comply with the National Qualifications Framework.

To qualify for a **Postgraduate Certificate** a student must successfully complete all required assessments and obtain a minimum of 60 credits of which at least 30 must be at level 7. The pass-mark in all modules is 40%.

The award of Postgraduate Certificate is not differentiated.

To qualify for a **Postgraduate Diploma** a student must successfully complete all required assessments and obtain a minimum of 120 credits of which at least 90 must be at level 7. The pass-mark in all modules is 40%.

The award of **Postgraduate Diploma with Commendation** will be made to students who satisfy the requirements for the award and achieve an overall average mark of 60 – 69% at the first sitting in the marks awarded for Stage 2 modules equivalent to at least 60 credits.

The award of **Postgraduate Diploma with Distinction** is made to students who achieve an average mark of 70% at the first sitting in the marks awarded for Postgraduate stage, which is equivalent to 60 credits.

To qualify for a **Master's Degree** a student must successfully complete all required assessments and obtain a minimum of 180 credits of which at least 150 must be at level 7. The pass-mark in all modules is 40%.

The award of **Master's Degree with Commendation** will be made to students who satisfy the requirements for the award and achieve an overall average mark of 60 - 69% at the first sitting in the marks awarded for Stage 3 modules equivalent to at least 60 credits.

The award of **Masters Degree with Distinction** is made to students who achieve an average mark of 70% at the first sitting in the marks awarded for the Master's Project, which is equivalent to at least 60 credits.

External Examiners are appointed. Their work includes:

- reviewing coursework assignments and assessment criteria
- approving examination papers
- monitoring standards through moderation of completed assessments
- attending Examination Boards
- participating in the course development processes.p

MSc Engineering Product Design

Student Guide

Background

Students with skills in a wide range of areas will find this course enjoyable and stimulating. In addition to the traditional first degree routes of product design and engineering, it would also suit those from other disciplines with skills in creativity and problem solving.

Within the consumer product sector, pressures for more flexible design and manufacturing processes are increasing as customers demand more frequent new product introductions, and wider specification variants.

In order to meet the new market requirements and still be cost competitive, product & component manufacturers are reconsidering both their design and manufacturing methods through a number of methods. Amongst these are, the application of new technologies and materials, the adoption of more flexible production methods, and the use of accelerated design and development techniques (such as digital 3D design styling, computer based performance prediction/analysis and virtual component testing), that now comprise the digital product development process.

The use of these new and emerging techniques requires new skill demands from a flexible design & engineering design workforce. To meet the new volatile market needs with timely and creative responses, designers and engineers need to be capable of working closely together, utilising a range of advanced creative design and detail performance/analysis tools. This course develops design professionals that meet the industry need for creative engineering product designers.

What does the industry want?

Graduates empowered with these 'Creative Engineering' skills will become valuable members of any team working within product design, development and production. Industry actively welcomes professionals who can demonstrate the ability to understand the needs of the whole organisation and beyond, displaying 'joined up thinking.'

By combining the best aspects of both design and engineering in one Post-Graduate Programme, the course provides an extremely powerful basis for the provision of engineering designers who can start to tackle complex problems immediately whilst understanding how to manage and guide the company. The need for creativity is becoming more and more important in all established and emerging economies. The route to survival in these economies lies in innovative solutions being delivered across the organisation from marketing through design to manufacture.

What will I Study?

The MSc Engineering Product Design course offers the following themes:

- **Postgraduate Study Development Unit**
- **Digital Design** – Design Process, Digital Systems and Communication, 3D CAD Systems
- **Design in Business** – Design for Market, Managing Innovation, Design Legislation

- **Postgraduate Project Development Unit**
- **Design for Product** – Human Factors, Biodynamic Mechanics, Design in Practice
- **Design Futures** – New Materials, Design for Manufacture, Futurology
- **Master's Project**

You will experience a wide variety of subjects and many different types of learning environment including lectures, tutorials, and computer simulation and visualisation. The course incorporates a significant amount of mini project work to provide you with an opportunity to develop and apply your knowledge.

One of the aims of the course is to develop active, autonomous learning. The variety of skills and knowledge that you bring to the courses will be developed by a variety of means outlined within the theme book. As a part of each of the elements of the course you will participate in peer review sessions where your work and the work of others will be reviewed and analysed by fellow students. This reflects the way in which product design and development occurs in the industrial or commercial environment.

Who will teach me?

The course team is at the Technology Innovation Centre, at the University of Central England. In addition, external industrialists are used to provide guest lectures/seminars, offering more substantial support across entire modules and complementing existing academics.

Am I just going to be taught from a Classroom?

No, a Purpose built Design Studio and other Labs and Workshops, boasting high-technology facilities, are available for you. Classrooms are used when the subject content makes them the best environment for learning.

What are my employment prospects?

The Master of Science degree in EPD will provide you with the expertise and knowledge required for the specification, design, implementation and management of complex engineering product design projects.

The study of current methodologies and practices within the context of practical case-studies and projects will give you the confidence to tackle a wide range of multidisciplinary problems within the industry. It will develop and enhance existing skills, and introduce new ones. The course fills a particular need for students requiring advanced study in a wide range of modern techniques for whole product design and engineering, within a flexible learning environment.

Typical routes of employment that could lead from this programme includes:

- Staff designers working within design and manufacturing companies
- Design consultants working with a range of manufacturing companies
- Project managers using a range of skills to manage large, complex projects

How do I apply?

University Faculty: Technology Innovation Centre
Course Length: 1 year and 1 term full-time and normally 2 years part-time
Location: Millennium Point, Curzon Street, Birmingham B4 7XG
Enquiries: Information Officer (at the above address) or at enquiries@tic.ac.uk or Telephone: (+44) (0)121 331 5400

MSc Engineering Product Design

Employers Guide

Introduction

The Technology Innovation Centre, part of the University of Central England, offers a portfolio of engineering based programmes. This course focuses on the development of creative, business aware design engineers, proficient in the use of the latest digital tools and processes.

The course is particularly designed to reflect the growing demand in industry for the use of digital tools and communication systems. It will provide the student with an insight and skill level in how they are utilised, in order to gain competitive advantage and market share.

Facilities / Partnerships

You will have access to state-of-the-art facilities at the Technology Innovation Centre (**tic**). The course is based within the **tic**, which is a part of the University of Central England. The **tic** is located within Birmingham's prestigious Millennium Point building, a £114 million development providing some of the best resources and facilities in the country and the cornerstone of Birmingham's Eastside Learning Zone. The course makes full use of industrial visits and guest speakers encompassing a wide range of expertise.

Programme Aims

To provide a course of study that develops the student intellectually and creatively by combining knowledge and skills in the use of complex design engineering systems to meet the market need for professionals in the changing environment.

The Curriculum

The MSc Engineering Product Design offers the following themes:

- **Postgraduate Study Development Unit**
- **Digital Design** – Design Process, Digital Systems and Communication, 3D CAD Systems
- **Design in Business** – Design for Market, Managing Innovation, Design Legislation
- **Postgraduate Project Development Unit**
- **Design for Product** – Human Factors, Biodynamic Mechanics, Design in Practice
- **Design Futures** – New Materials, Design for Manufacture, Futurology
- **Master's Project**

Expected Outcomes

Postgraduates can be expected to have acquired extensive knowledge and hands-on practical experience of product development.

Typical Postgraduates from the MSc EPD course should be proficient in the following:-

- 3D surface and solid modelling
- New product development and introduction
- Engineering design of manufactured products
- Demonstrate a real understanding of the business/market context of a particular design.
- Relating sound engineering practice to design which maximises customer value.
- A balance of judgement between the visual/creative requirements and engineering practicality and feasibility
- Product design and its relationship with business.
- Be creative in the approach to all design tasks or problems, and utilise the most appropriate new technologies and processes, including the latest project communication & knowledge based software
- A drawing & model making capability and a strongly developed ability to think in three dimensions

Contact Details

University Faculty: Technology Innovation Centre
Course Length: 1 year and 1 term full-time and normally 2 years part-time
Location: Millennium Point, Curzon Street, Birmingham B4 7XG
Enquiries: Information Officer (at the above address) or at enquiries@tic.ac.uk or Telephone: (+44) (0)121 331 5400