

University of Glasgow

Academic Standards Committee - Friday 29 May 2009

Statement of Intent – Development of a MSc in Product Design Engineering in Collaboration with the Faculty of Engineering

Mrs Jackie McCluskey, Senate Office

The Glasgow School of Art
School of Design**DRAFT**

Provisional Programme Title: MSc in Product Design Engineering

Draft Programme Data**Provisional Programme Title**

Master of Science (MSc) in Product Design Engineering

Academic Award(s) to be conferred

SCQF Level 11/SHE level 5

Stage	Award	Credits	Nominal Learning Hours	Weeks
1	Postgraduate Certificate	60	600	15
2	Postgraduate Diploma	60	600	15
3	Master of Science	60	600	15
		180	1800	45

Funding source

Self funding

Mode of study/duration

12 months (45 weeks) full time, 24 months (90 weeks) part time

Awarding institution

The Glasgow School of Art / Glasgow University

Date of first intake

September 2010

Professional body association

None

Details of Memorandum of Cooperation

GU Memorandum

University Academic Regulations<http://senate.gla.ac.uk/calendar/current/contents.html>**Relevant QAA Subject Benchmark Groups**Art and Design
Engineering

Introduction

The proposed Master of Science (MSc) in Product Design Engineering is a new postgraduate programme being introduced in the School of Design in order to facilitate an increase in postgraduate student numbers at the GSA, and to further expand teaching provision in Design beyond the undergraduate curriculum. Extending and consolidating the relationship that exists between GSA and the University of Glasgow in the area of Product Design Engineering, this programme will be co-designed and co-delivered, with 50% of input being provided by each institution.

Undergraduate students at GSA presently studying PDE can go on to attain a postgraduate (level 11) award – an MEng. This takes the form of a five year ‘integrated masters’. The final year is not presently available as a stand alone programme: not only is its content specifically designed to build upon the undergraduate PDE curriculum, but the IMechE (Institution of Mechanical Engineers) who accredit the programme have made clear that they would not like to see year 5 available separately. The final year is thus not part of the suite of Common Academic Framework-compliant PGT programmes delivered at GSA.

The proposed new MSc programme has significantly different content to the extant MEng, and brings together a different combination of staff and specialisms from the University of Glasgow and GSA. Whereas the relationship between GSA’s PDE department and the Faculty of Engineering at the University of Glasgow has, until now, been largely with the department of Mechanical Engineering (Mech Eng), this new programme will also forge links with Electronics and Electrical Engineering (EEE) – indeed, the 50% of the programme delivered by staff at the University of Glasgow will be equally divided between Mech Eng and EEE. Although there may be some overlap, it is anticipated that the market for the new MSc programme will not be the same as that for the integrated masters.

Postgraduate provision in the School of Design has been limited in recent years to the MDes in Textiles as Fashion. That particular programme has recently been revalidated, and will soon be rebranded as an MDes in Textiles and Fashion. It is intended that this revalidation process, occurring alongside the validation of the new MDes in Design Innovation, and the construction of new masters programmes in Communication Design and PDE, will enable some strategic planning: identification of areas of common PGT provision across the School of Design (facilitating economies of scale, and cutting back delivery costs); design of electives that will appeal to postgraduate students across GSA; and so on. The PDE programme will be fully compliant with the PGT Common Academic Framework at GSA, whilst also fitting with the structures of postgraduate provision at the University of Glasgow.

Expansion of postgraduate provision within the School of Design has become a pressing need. The Glasgow School of Art Strategic Plan for 2004-08 (2007-08 Update) identified an ‘ambition... to increase the percentage of postgraduate students from its current 9% to 15% in 2008 and 22% by 2015.’ This ambition was echoed in the School of Design’s Strategic Plan for 2007-08, which noted the urgent requirement to expand the range of taught postgraduate programmes in design. Further, the International Recruitment Review and Strategy, 2007-08, noted that ‘we are clearly missing out on a postgraduate design market, especially where this is the sector providing most growth across our disciplines. We have low numbers of students from all countries... This is quite clearly due to the lack of programmes we offer in comparison to our competitors.’ At present, postgraduate students are a very small percentage of total numbers in the School of Design: in 2007-8, there were c.680 undergraduate students across design disciplines, and 7 students taking the MDes in Textiles as Fashion. If undergraduate numbers hold steady, a postgraduate cohort in the School of Design of 15% would equate to 120 students; a cohort of 20% would be 170 students. Evidently, there is a significant amount of growth needed here: the MSc in Product Design Engineering is envisioned as a vital step towards such expansion.

There are very few postgraduate programmes in Product Design Engineering across the UK. The main competitor for the proposed MSc programme is the Innovative Design Engineering programme run between the Royal College of Art and Imperial College. However, the latter is a two year programme, and hence demands a more considerable commitment in terms of time and fees from its students. Kingston University runs an MSc in Advanced Product Design Engineering; Loughborough University runs an MSc in Engineering Design. Outside of the UK, there are potential competitor programmes at TU Delft (an MSc in Integrated Product Design) and TU Eindhoven (who run a masters in Industrial Design), as well as at Stanford and at MIT. There is clearly, then, considerable room for a new programme in this field; it would be the first of its kind in Scotland. The unique selling point of this proposed programme is its bringing together of two institutions, and three particular departments: PDE at GSA, and Mech Eng and EEE at the University of Glasgow. This combination is not only intellectually motivated – it will stimulate interdisciplinary modes of thinking and practice – but it also reflects some of the most innovative and interesting product design engineering happening in the sector at present.

The new MSc programme co-delivered by GSA and the University of Glasgow will offer specific incentives that will appeal to students over all other programmes available across the UK and elsewhere. Students will have access to staff expertise in both institutions, as well as the broad range of facilities that both offer. They will benefit from studying in two institutions, and mixing with other postgraduate students in both art school and traditional university environments. At GSA, students will be able to take advantage of existing opportunities available through PDE, including connections to industrial enterprises and organizations around the globe (which it is hoped this programme will help to expand yet further), and links with other relevant HEIs around the world, such as Trondheim NTNU in Norway. More broadly, students will have access to staff and resources within the School of Design. Staff from the School of Design at GSA, along with representatives from the University of Glasgow, the University of Strathclyde, and The Lighthouse are all involved in the development of Design Innovation Scotland. Further partnerships exist between the School of Design and the Scottish Government, the Scottish Parliament's Futures Forum, Skills Development Scotland, Scottish Enterprise, Highlands and Islands Enterprise, Gray's School of Art, NESTA, and with BT and Philips Design in the Netherlands. Further, it is hoped in developing the MSc in Product Design Engineering that useful practical and pedagogic links can be made between the programme curriculum and the activities and aims of certain research centres at GSA, such as the DDS.

Not only will these links and activities provide students with some firsthand experience of the burgeoning design field across Scotland, but they will also feed back into Scotland's creative economy. The introduction of the MSc in Product Design Engineering will hopefully contribute to sustainable economic growth in Scotland by developing industrial and public creativity through excellence in applied design thinking. The academic environment will link studio projects into various aspects of the public, civic and private sectors, and thus expand knowledge transfer and knowledge exchange possibilities.

Rationale and purpose of the programme

There are increasing pressures, from both existing and emerging world marketplaces, for products which not only respond to the needs of function, user and society, but which can be brought to market ever more rapidly through state-of-the-art development and manufacturing processes. Industries which develop, manufacture and market today's products need high-calibre graduates equipped to handle these processes with management skill and creative drive, and this new PDE MSc programme will develop graduates with these skills.

As already identified, the proposed programme would be the first of its kind in Scotland. Its ethos is to offer a relevant and applicable technological footprint that is not currently offered

elsewhere. It also offers a unique combination of Product Design, Mechanical Engineering, and Electronic and Electrical Engineering that distinguishes it from the integrated masters presently available, and provides a distinctive and attractive character. Demands from industry and academic research highlight the need for postgraduates who can articulate and synthesise the fields brought together by this programme.

It is also hoped that some of the students on this PDE programme will pursue further study to MPhil and PhD levels.

Intended student numbers

As already identified, in order to meet a target of 20% of postgraduate students in the School of Design, assuming that undergraduate figures hold firm, the PG cohort needs to reach 170.

The new MSc in Product Design Engineering programme will appeal to a variety of potential students, including:

- existing GSA UG PDE students; not only will the programme be pitched to these students through open events, but likely candidates for the MSc will be identified as early as possible by staff teaching in PDE;
- undergraduate students without a background in PDE, but who have a requisite range of design and/or engineering/technical skills gained from studying other subjects;
- individuals working in the design and/or engineering/technical industries who desire the space and time to experiment with alternative approaches to practice.

Although it is expected that most applicants to the new programme will have some experience of studying design or engineering/technical subjects at an undergraduate level, each application will be considered on its own merits.

It is envisioned that an MSc in Product Design Engineering will have a particular appeal to overseas candidates. The postgraduate programmes presently available in Engineering at the University of Glasgow predominantly attract significant cohorts of overseas students – their largest markets are from East Asian countries and India. Engineering staff who have been involved in developing the content of this new programme predict that they will be able to pitch the programme to similar territories.

In relation to Design, HESA statistics for 2006-7 highlight that, of all overseas students coming to study creative arts and design in the UK (10450), more than 50% study design (5400), in contrast to around 10% studying fine art (1010). HESA identify the top markets for overseas students coming to the UK to study design subjects as China, Taiwan, South Korea, India, the United States, and Japan (with smaller numbers coming from Thailand, Canada, Malaysia and Hong Kong). GSA already attends annual fairs to promote its undergraduate and postgraduate programmes in East Asian territories, as well as the US; a concerted effort could be made to sell the new MSc programme in these countries. Anecdotal evidence from the Head of Recruitment at GSA has identified the interest in studying design subjects at postgraduate level expressed by potential students from East Asian countries. The Head of PDE at GSA annually receives a notable number of email queries from potential students regarding the possibility of undertaking postgraduate-level PDE study.

In the first instance, it is hoped that the new programme would attract a cohort of around 8 students (4 Home/EU, 4 OS), with student numbers increasing as the MSc establishes itself, and graduating students are able to recommend the programme to others.

Educational aims and intentions of the programme

The MSc in Product Design Engineering programme aims to:

- Offer each individual student the opportunity to critically develop his or her own work in the context of a rigorous but supportive intellectual climate;
- Acquire key skills in the areas of user-centred design, product design, mechanical engineering, and electronic and electrical engineering;
- Encourage students to identify and explore key contextual issues relevant to their practice;
- Develop students' awareness and knowledge base in design philosophy, theory, practice and research in the context of innovative forms of design;
- Enable students to achieve the highest possible standards in their work, so that graduates have the confidence, maturity and intellectual and interpersonal skills necessary to function successfully in the design engineering field;
- Equip students with the highly developed intellectual, practical and interpersonal skills deemed necessary for their career.

Learning outcomes

Programme learning outcomes

By the end of the MSc in Product Design Engineering, students will be able to:

- Understand design contexts, and demonstrate advanced knowledge of the socio-cultural, technological and political debates affecting the contemporary practice of design and design theory;
- Demonstrate an advanced engineering skill base, in the areas of mechanical engineering, and electronic and electrical engineering;
- Demonstrate a high level of communication skills in the presentation of ideas and design and engineering concepts;
- Relate broad design and engineering principles, methods and ideas to their work;
- Demonstrate the application of knowledge gained through outputs produced for assessment, whether formative or summative;
- Demonstrate the ability to conceptualise, manage and carry through to completion a major project.

Stage learning outcomes

At the end of each stage, each student should have the ability to work with and/or demonstrate:

	Stage 1 PgCert	Stage 2 PgDip	Stage 3 MSc
Knowledge and Understanding	<p>An understanding of cultural production in relation to contemporary socio-political and economic issues.</p> <p>An understanding of the principles and rationale of independent research.</p>	<p>An understanding of the critical balance between research and practice in the planning of a significant project within PDE.</p> <p>An enhanced understanding of studio practice in relation to interdisciplinary contexts.</p>	<p>The ability to make informed judgments and decisions in relation to current issues within PDE practice.</p> <p>The ability to contextualize one's own work in relation to broader contemporary practices.</p>
Applied Knowledge and Understanding	The development of work in response to	The development of a body of work for	The development of a body of work for

	contemporary themes and issues.	public use and display that is distinctly expressive of the student's point of view, in relation to thematic issues. The capacity to undertake appropriate research in order to define and develop a relevant topic of inquiry.	public display and final assessment, which is a full articulation of the student's 'own voice'. The exercise of autonomy, independence and rigorous critical analysis in the conception and production of a large-scale project.
Professional Practice: Communication, Presentation, Working with Others	An appropriate response to the views and positions of others, and an ability to offer substantial constructive criticism to others. An awareness of the ethical issues arising from design, engineering, and research practice.	A heightened awareness of his/her own position within and contribution to the wider contexts of cultural practice, including the ability to present and discuss own work. The ability to make informed choices regarding the multidisciplinary aspects of the development of individual learning experiences.	Good practice and cooperation when working in professional contexts, including working constructively with others in a variety of pedagogical, institutional and professional situations.

Staff in PDE centre aims and learning outcomes around 'the three p's': Product, Process and Presentation.

Product: what the product the student is designing has to do and have

As the candidate progresses through the programme, they should gain an increasing knowledge and understanding of:

Human Interaction

- Meeting the user's functional, aesthetic and emotional needs - including, but not limited to, user cycle, experience and feedback, aesthetics, semantics, symbology, form and colour

Materials and Manufacturing

- Appropriate selection and specification

Technologies and Components

- Choosing and selecting appropriate technologies and components and incorporating their function within the product

Process: how the student carries out the activity of designing products

As the candidate progresses through the programme, they should gain an increasing ability to apply their knowledge of product in practical problem-solving situations, including in situations similar to those found in a professional working environment.

Use of applicable engineering theory

- Incorporating theoretical understanding into design work

Economic and Commercial issues

- Product costs vs Volumes vs Manufacturing methods

Environmental and Societal issues

- Ecological and sustainable issues that relate to politics and society, and that affect the development of products

Professional and Ethical Responsibilities

- Evidence of appropriate engagement with users and external contacts demonstrating correct moral conduct

Contemporary, Contextual and Historical Design Issues

- Past, present and future products, technologies and market influences that can inspire and influence design

Creativity

- How creative a student's ideas are, and techniques that can help

Design Process and Investigation

- Developing a design, concept generation and evaluation, iteration, detail development embedded in design, including:
 - *Analysing*: Breaking down a variety of information, issues, structures and objects, from simple to complex, in order to understand the purpose, significance, characteristics, and inter-relationship of their component parts;
 - *Synthesising*: Creatively combining knowledge, ideas and physical objects to generate new knowledge, ideas or objects which fulfil a defined purpose;
 - *Evaluating*: Weighing up knowledge, ideas and objects against appropriate criteria, in order to decide their usefulness and relevance to the task in hand.

Learning skills

- Response to staff input and feedback; learning from studio experiences; responding to staff advice.

Commitment and Energy

- Engagement with studio activity; attendance and personal timekeeping.

Project and Time Management

- Managing and scheduling project activity.

Research Activity

- Appropriate information gathering; analysis; extracting key issues and product requirements.

Presentation: Externalising and Representing Ideas

As candidates progress through the programme, they should maintain and develop knowledge, understanding and working ability in:

Project Documentation

- Externalising, recording and developing ideas; Design Journal, Logbook, research findings

Presentation and Communication of Ideas

- Visual and verbal communication of ideas to others; presentation sheets and drawings

Contributory skills

- Freehand drawing
- Formal drawing
- Physical modelmaking
- 3D digital modeling (CAD)
- 2D digital image manipulation
- General IT skills (word processing, spreadsheet, internet usage, network usage)

Provisional programme structure

PgCert	PgDip	Masters
15	15	60
15	15	
15	15	
15	15	

Stage	1	2	3
GSA mand. course	15		
GSA elective		15	
GSA core courses	30		
GU core courses	15	45	
Final project			60

Proposed programme content:

Stage 1, 60 credits

Core Research Skills for Postgraduates (15 credits, GSA)
 Workshop skills (including model-making and prototyping) (15 credits, GSA)
 CAD and FEA (15 credits, GSA)
 Design for Manufacture (15 credits, GU)

Stage 2, 60 credits

Human Factors (15 credits, GSA – new cross-school elective)
 Project Management (15 credits, GU)
 Integrated Engineering Design (15 credits, GU)
 Microelectronics in Consumer Products (15 credits, GU)

Stage 3, 60 credits

Studio Project, co-taught and co-assessed by GSA and GU

In line with the PGT Common Academic Framework, this programme will be constructed from credit rated courses, each of a multiple of 15 credits. Students will be able to exit from the programme at 3 points, with a PgCert (after 15 weeks), a PgDip (after 30 weeks), or a full MSc (after 45 weeks).

In Stage 1, students will take the mandatory Core Research Skills course at GSA. This will be supplemented by a 15 credit course at GU, and by 30 credits of programme-specific courses at GSA. At Stage 2, students will opt for one 15 credit elective course from the range of Stage 2 PGT electives available across GSA (and as part of the development of this programme, a new elective in Human Factors will be constructed). In addition, they will take 45 credits of courses at Glasgow University. Stage 3 will be comprised of one large, 60 credit project course of largely self-directed study, co-delivered and co-assessed by staff from GSA and GU.

Anticipated demand on staffing, resources and services

The initial developments of the MSc in Product Design Engineering have been orchestrated by Craig Whittet, as part of his remit with the School of Design whilst working as Head of the

Department of Product Design Engineering. Evidently, putting together the curriculum content for the new MSc, and managing its launch, will require some dedicated staff time. This is expected to be:

- 0.2 FTE programme leader at GSA
- 0.1 FTE administrative support

In the first instance, in order to keep costs down, the additional staffing for GSA's input into the programme will be provided through backfill: the PDE programme will be run, delivered and assessed by existing members of staff, and the undergraduate teaching it removes them from will be covered by VLs. The staffing at GU, in both Mech Eng and EEE, will be organised and coordinated by the Faculty of Engineering.

The finances for the new programme will operate along the lines of the MRes in Creative Education (formerly MADAE) at GSA. The programme will be owned, coordinated, and administered by GSA. Staff contributions from the University of Glasgow will be charged, through GSA's finance office, to the School of Design. The programme will be advertised as part of the suite of PGT programmes available at GSA, and applications from students will go through GSA's Registry. (The programme will also appear on the GSA pages of the University of Glasgow's postgraduate prospectus).

Studio space and workshop provision (already earmarked) will be provided for the students in both the Haldane and Foulis buildings; they will also have access to workshop space in the Faculty of Engineering at the University of Glasgow. Costs will be kept down by sharing of courses with other programmes of study within the School of Design, across GSA, and with other postgraduate programmes in the Faculty of Engineering at the University of Glasgow. It is expected that a small amount of money would be necessary to cover consumables (computers, materials, software licences, and so on) at GSA. All of the expenses, however, would be covered by the fees of 8 students (4 home/EU, 4 OS). For a full breakdown of expected costings, please see the attached financial rationale.

Compatibility of the new proposal with the School's existing portfolio of programmes

The proposed MSc programme will be fully integrated with, and contribute to, the GSA taught postgraduate Common Academic Framework. It will derive elements from the framework (a structure based on 15 credit courses, the Stage 1 mandatory course, and so on), and will make available a new open elective course of study to other programmes. Common courses continue to be developed across the School of Design at postgraduate level, some of which should be able to fruitfully link together students studying on the MSc in PDE with those on other postgraduate programmes of study.

In addition, the MSc in Product Design Engineering will create and deliver an array of taught courses which enhance and expand the provision of the School of Design in this area. The undergraduate PDE programme, and its integrated masters option, is annually rated highly by external assessors, advisors, and collaborators for the quality of provision and of the work produced by students. This new postgraduate programme will further enhance the status of the department, and of the School of Design at GSA, as well as developing further productive alliances with staff and departments at the University of Glasgow.

Finally, the MSc in Product Design Engineering will complement the array of other postgraduate programmes already available at GSA. It has a distinctive character and offers a fresh approach to the field of design; its interdisciplinary and inter-institutional nature enables potential links with other PGT provision across both GSA and the University of Glasgow. Perhaps most crucially, the introduction of this programme will facilitate the growth of postgraduate numbers at GSA – and contribute to the development of a distinctive postgraduate community.

Draft project plan

Action	Date
Production of Statement of Intent for MSc in PDE, incorporating consultation with Marketing and Recruitment; R&PG; Finance	March 2009
Presentation of Sol to SoD PGMC and SoD Board of Studies	April 2009
Presentation of MSc Statement of Intent to PGC	May 2009
Begin advertising and recruitment for MSc in PDE	July/August 2009
Development of MSc rationale and DPD	June-Nov 2009
Stage 1 Validation for MSc	Nov/Dec 2009
Stage 2 Validation for MSc	Feb/March 2010
Launch of MSc in PDE	September 2010