Glasgow School of Art Programme Specification
Programme Title: MSc in Product Design Engineering

Please note that this programme specification is correct on the date of publication but may be subject to amendment prior to the start of the 2023-24 Academic Year.

1. Programme Details:

Programme Title	MSc in Product Design Engineering
HECOS Code	
School	School of Design
Programme Leader	Craig Whittet
Minimum Duration of Study	12 months, registered study
Maximum Duration of Study	24 months, registered study
Mode of Study	Both Full and Part Time
Award to be Conferred	Master of Science
Exit Awards	Stage 1: Postgraduate Certificate in Product Design Engineering Stage 2: Postgraduate Diploma in Product Design Engineering Stage 3: Master of Science (MSc) in Product Design Engineering
SCQF Level:	11
Credits:	180

Academic Session	2023-24
Date of Approval	PACAAG August 2022

2. Awarding Institution	University of Glasgow
3. Teaching Institutions	The Glasgow School of Art University of Glasgow
3.1 Campus	Glasgow
4. Lead School/Board of Studies	School of Design
5. Other Schools/Board of Studies	N/A
6. Programme Accredited By (PSRBs)	Institute of Mechanical Engineers

7. Entry Qualifications	
7.1 Highers	N/A
7.2 A Levels	N/A
7.3 Other	Entry requirements are normally a 2.2 Honours degree or equivalent (eg GPA of 3.0 or above) in a relevant subject area (product design engineering, mechanical engineering, electronic and electrical engineering being of particular relevance) or equivalent professional practice. Depending on your previous experience and qualifications, applicants may be asked to complete a design engineering assignment as part of their application.
7.4 English Language Requirements	All students will have to provide evidence of English language proficiency when applying.

	International Students Students who require a Tier 4 visa to study in the UK must meet one of the following requirements in order to gain entry: • IELTS for UKVI Academic with an overall score of 6.5 with a minimum of 6.0 in all components; • complete an acceptable Pre-sessional English Language Programme taught from within the UK with an outcome that equates to the IELTS scores as stated above. Students who have a degree from an English speaking country, or are a national of an English speaking country as listed in the UKVI Guidance, may use this as proof of English language ability.

8. Programme Scope:

The MSc in Product Design Engineering (PDE) is a joint programme between the Glasgow School of Art (GSA) and the University of Glasgow. The GSA elements of the programme are based in the School of Design and embrace the ethos of a studio-based learning and teaching environment common throughout the Glasgow School of Art. The University of Glasgow elements of the programme are primarily provided by the College of Science and Engineering, through the School of Engineering.

The PDE MSc programme seeks to add to the conventional understanding and application of design engineering as a tool for driving technological and economic innovation. It achieves this through a concentration on the user as the fundamental driver of the Product Design Engineering process. One of the PDE programme aims is to respond to the industry demand for confident and skilled design engineering graduates who can apply a creative process to the development of products to meet user needs. The programme also aims to inspire students to become the developers, facilitators and leaders in the development of products and related services.

The programme includes subject material from Product Design, Human Factors, Mechanical, Electrical/Electronic and Software Engineering. In addition to the core subjects, students can select electives from the Glasgow School of Art and University of Glasgow.

9. Programme Structure:

The programme comprises 180 credits in total, 120 credits of taught material and a project of 60 credits. It is governed by the Generic Regulations for Taught Masters Degrees. Early exit awards of Certificate (60 credits) and Diploma (120 credits) are available.

* In exceptional circumstances it may be possible in the early stages of the programme to consider an alternate Core Research Methods course in Stage 1

Stage 1	**Location**	**Credits**	**SCQF Level**
PCXS106 Core Research Methods for Design*	GSA	20	11
PPDE102 PDE Introduction Project (UoG ENG5255P)	GSA	10	11
PPDE103 Advanced Manufacture (UoG ENG5096)	UOG	20	11
PPDE104 Microelectronics in Consumer Projects 4 (UoG ENG4098)	UOG	10	11
Total		**60**	

Stage 2			
PPDE206 PDE Human Factors M (UoG ENG5157)	GSA	10	11
PPDE207 Integrated Engineering Design (UoG ENG5043)	UOG	20	11
PGT Elective M	GSA	20	11
Optional Courses Students choose 1 course from the following:			
ENG3034 Instrumentation & Data Systems 3	UOG	10	
ENG3091 Advanced Programming and Software Eng 3	UOG	10	
ENG5031 Fault, Detection, Isolation and Recovery	UOG	10	
Total		**60**	
Stage 3			
PPDE301PDE Final Project M (UoG ENG5156P) *Note: The student selects a subject from project list, subject to acceptance by supervisor and availability of resources.*		60	11
Total		**60**	

9.1 Programme Structure – Exchange In/Exchange Out/Study Abroad:
N/A

10. What are the requirements for progressing from each stage?
A student will be permitted to progress to Stage 3 only if they have obtained a grade point average of C3(12.0) or above in the taught courses (Stage 1 & 2) with at least 75% of the credits at grade D3(9) or above and all credits at grade F3(6) or above.

11. Programme Aims:
The specific aims of the programme are as follows. To allow students the opportunity to acquire and understand the key principles of theory, research and practice within the field of Product Design Engineering. These principles include contemporary design engineering practice and its context; product design engineering as a collaborative process; research methodologies; and the critical, analytical, problem-based learning skills required for both autonomous practice and team-working. To develop a greater understanding of the design techniques, production and manufacturing processes, as well as the conceptual and research components previously acquired. It aims to build upon stage 1 through an emphasis on: producing and reporting on practical projects, frequently through group activity; technological potential within user-led collaboration, e.g. Human Factors; and creative collaboration and the generation of social and economic value. Students will be expected to develop a proposal of study outlining their self-directed final project, before embarking on the Masters project. To further develop and apply the understanding of previous stages in a critical and reflective manner through the completion of a self-directed project and report. This will require and involve the application of integrating skills including negotiation, research, evaluation, communication and project management.
11.1 Stage 1 Aims:
Stage 1 (PGCert) – Weeks 1 through 15: 60 credit points

The programme aims at Stage 1, the Postgraduate Certificate in Product Design Engineering, are designed to allow students the opportunity to acquire and understand the key principles of theory, research and practice within the field of Product Design Engineering. These principles include contemporary design engineering practice and its context; product design engineering as a collaborative process; research methodologies; and the critical, analytical, problem-based learning skills required for both autonomous practice and team-working. Students successfully completing this stage of the programme can progress to Stage 2 (PG Dip).

11.2 Stage 2 Aims:

Stage 2 (PGDip) – Weeks 16 through 30: 60 credit points

Stage 2 of the programme, the Postgraduate Diploma in Product Design Engineering, aims to develop a greater understanding of the design techniques, production and manufacturing processes, as well as the conceptual and research components acquired in Stage 1. It aims to build upon stage 1 through an emphasis on: producing and reporting on practical projects, frequently through group activity; technological potential within user-led collaboration, e.g. Human Factors; and creative collaboration and the generation of social and economic value. Students will be expected to develop a proposal of study outlining their self-directed final project during this stage. On successfully completing this stage of they can advance to the Masters stage, Stage 3

11.3 Stage 3 Aims:

Stage 3 (Masters) – Weeks 31 through 45: 60 credit points

Stage 3 of the programme aims to further develop and apply the understanding of previous stages in a critical and reflective manner through the completion self-directed project and report. This will require and involve the application of integrating skills including negotiation, research, evaluation, communication and project management.

12. Intended Learning Outcomes of Programme:

The PDE MSc Intended learning outcomes are clustered into the three categories of “Product”, “Process” and “Presentation”.

The certificate stage equates broadly to initial teaching of core skills and methods – and in particular some of those outcomes listed under “Presentation” and “Process”. The diploma stage equates broadly to the application of these skills and methods – predominantly, but not exclusively “Process” outcomes. The final stage is where these skills and methods will be integrated to demonstrate Mastery of the subject through a self-directed project. In this stage “Product” outcomes are notably added to those achieved in the certificate and diploma stages.

PRODUCT – What the Product being designed has to do and have.
At the end of this MSc programme students should be able to:

1. Explain the main theories of human interaction through product solutions:
2. Develop a User Requirement Specification which meets the user’s functional, aesthetic and emotional requirements and expectations (including but not limited to: User Cycle, Experience and Feedback, Aesthetics, Semantics, Symbology, Form and Colour).
3. Select and specify appropriate Materials and Manufacturing processes:
4. Select and specify appropriate technologies and Components for product specification

PROCESS – How to carry out the activity of designing products.
As the student progresses through the MSc programme, he/she should gain an increasing ability to develop and apply knowledge of the Product in practical problem-solving situations, eventually in situations akin to those found in a professional working environment. Many of these skills are specific to (but not limited to) the Product Design Engineering programme. At the end of this MSc programme students should be able to:

1. Apply Engineering Theory in both studio and practical work:
2. Compute optimum Product Costs against Volumes against Manufacturing Methods for strategic product development
3. Evaluate ecological and responsibility issues from Politics and Society that affect the development of products and justify their introduction to Market
4. Engage with users and external contacts demonstrating an awareness of professional and ethical responsibilities
5. Develop justifiable product solutions using creative approaches, techniques and methods.
6. Apply concept generation & evaluation techniques resulting in optimised Design solutions.
7. Analyse a variety of information, issues, structures & objects, from simple to complex, in order to understand the purpose, significance, characteristics and inter-relationship of their component parts.
8. Synthesise knowledge, ideas and physical objects in creative ways to generate new knowledge, ideas or objects which fulfil a defined purpose.
9. Evaluate knowledge, ideas and objects, against appropriate criteria and specification, in order to decide their usefulness and relevance to the task in hand.
10. Engage with staff input & feedback, learning from studio experiences; responding to staff advice.
11. Engage with studio activity; attendance & personal timekeeping
12. Manage & schedule project activity effectively
13. Gather and analyse appropriate information and extract key issues & justify product requirements
14. Formulate research questions to methods of utilising visual and written sources.

PRESENTATION – Externalising and representing your ideas.
A range of skills are important in many aspects of life, and across a variety of personal and professional situations. At the end of this MSc programme you should be able to:

1. Externalise, record & develop ideas; (including Freehand sketching & drawing
2. Design Journal, Logbook, research findings).
3. Communicate to a range of audiences using Visual & Verbal Presentation Techniques and Methods
4. Generate Orthographic drawing to appropriate professional standards
5. Produce physical models as an integral component of the design process including prototyping for experience.
6. Produce virtual 3D Models (CAD) and Reverse Modelling/Engineering simulation
7. Apply appropriate IT Skills (including 2D Digital Image Manipulation and Compositing).

The programme learning outcomes described earlier under the headings Product, Process and Presentation apply to a greater, or lesser, extent to all three stages of the PDE MSc programme. Stage 1 equates broadly to initial teaching of core skills and methods, while Stage 2 equates broadly to the application of these skills and methods. In the final stage, Stage 3, these skills and methods are integrated to demonstrate Mastery of the subject through a self-initiated and self-directed project. The table below therefore indicates the stage at which each learning outcome is

primarily introduced and assessed. It should be noted that learning in one stage will continue to influence the quality of outputs in later stages of the programme.

	Stage 1	Stage 2	Stage 3
Product		1,2,4	3
Process	1,5,6,7,10,11,14	4,9	2,3,8,12,13
Presentation	1,2,4,5	3,6	

Table: Primary points of introduction and assessment of intended learning outcomes

12.1 Intended Learning Outcomes of Stage 1

Stage 1 you are developing new skills, design methods and processes. By the end of Stage 1 you should be able to demonstrate your ability to:

PROCESS – How you carry out the activity of designing products.

1. Apply Engineering Theory in both studio and practical work.
2. Develop justifiable product solutions using creative approaches, techniques and methods.
3. Apply concept generation & evaluation techniques resulting in optimised Design solutions.
4. Analyse a variety of information, issues, structures & objects, from simple to complex, in order to understand the purpose, significance, characteristics and inter-relationship of their component parts.
5. Engage with staff input & feedback, learning from studio experiences; responding to staff advice.
6. Engage with studio activity; attendance & personal timekeeping.
7. Formulate research questions to methods of utilising visual and written sources.

12.2 Intended Learning Outcomes of Stage 2

As you progress from Stage 1 through Stage 2, you should gain an increasing ability to apply your knowledge of Product, Process and Presentation and demonstrate design skills and methods in practical problem-solving situations. At the end of Stage 2 you should be able to:

PRODUCT – What the Product you're designing has to do and have.

1. Explain the main theories of human interaction through product solutions.
2. Develop a User Requirement Specification which meets the user's functional, aesthetic and emotional requirements and expectations (including but not limited to: User Cycle, Experience and Feedback, Aesthetics, Semantics, Symbology, Form and Colour).
3. Select and specify appropriate technologies and Components for product
4. specification

PROCESS – How you carry out the activity of designing products.

1. Apply Engineering Theory in both studio and practical work.
2. Engage with users and external contacts demonstrating an awareness of professional and ethical responsibilities.
3. Develop justifiable product solutions using creative approaches, techniques and methods.
4. Apply concept generation & evaluation techniques resulting in optimised Design solutions.
5. Analyse a variety of information, issues, structures & objects, from simple to complex, in order to understand the purpose, significance, characteristics and inter-relationship of their component parts.
6. Evaluate knowledge, ideas and objects, against appropriate criteria and specification, in order to decide their usefulness and relevance to the task in hand.

7. Engage with staff input & feedback, learning from studio experiences; responding to staff advice.
8. Engage with studio activity; attendance & personal timekeeping.
9. Formulate research questions to methods of utilising visual and written sources.

PRESENTATION – Externalising and representing your ideas.

1. A range of skills are important in many aspects of life, and across a variety of personal and professional situations. At the end of this MSc programme you should be able to:
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3. Communicate to a range of audiences using Visual & Verbal Presentation Techniques and Methods.
4. Generate Orthographic drawing to appropriate professional standards.
5. Produce physical models as an integral component of the design process including prototyping for experience.
6. Produce virtual 3D Models (CAD) and Reverse Modelling/Engineering simulation.
7. Apply appropriate IT Skills (including 2D Digital Image Manipulation and Compositing).

12.3 Intended Learning Outcomes of Stage 3

In the final stage, Stage 3, you should be able to demonstrate the integration of knowledge, skills, methods and process developed through Stages 1 and 2 evidenced through a self-initiated and self-directed project. At the end of Stage 3 you should be able to:

PRODUCT – What the Product you're designing has to do and have.

1. Explain the main theories of human interaction through product solutions.
2. Develop a User Requirement Specification which meets the user's functional, aesthetic and emotional requirements and expectations (including but not limited to: User Cycle, Experience and Feedback, Aesthetics, Semantics, Symbology, Form and Colour).
3. Select and specify appropriate Materials and Manufacturing processes.
4. Select and specify appropriate technologies and Components for product specification.

PROCESS – How you carry out the activity of designing products.

1. Apply Engineering Theory in both studio and practical work.
2. Compute optimum Product Costs vs Volumes vs Manufacturing Methods for strategic product development.
3. Evaluate ecological and responsibility issues from Politics and Society that affect the development of products and justify their introduction to Market.
4. Engage with users and external contacts demonstrating an awareness of professional and ethical responsibilities.
5. Develop justifiable product solutions using creative approaches, techniques and methods.
6. Apply concept generation & evaluation techniques resulting in optimised Design solutions.
7. Analyse a variety of information, issues, structures & objects, from simple to complex, in order to understand the purpose, significance, characteristics and inter-relationship of their component parts.
8. Synthesise knowledge, ideas and physical objects in creative ways to generate new knowledge, ideas or objects which fulfil a defined purpose.
9. Evaluate knowledge, ideas and objects, against appropriate criteria and specification, in order to decide their usefulness and relevance to the task in hand.
10. Engage with staff input & feedback, learning from studio experiences; responding to staff advice.
11. Engage with studio activity; attendance & personal timekeeping.

12. Manage & schedule project activity effectively.
13. Gather and analyse appropriate information and extract key issues & justify product requirements.
14. Formulate research questions to methods of utilising visual and written sources.

PRESENTATION – Externalising and representing your ideas.

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5. Produce virtual 3D Models (CAD) and Reverse Modelling/Engineering simulation.
6. Apply appropriate IT Skills (including 2D Digital Image Manipulation and Compositing).

13. Learning and Teaching Approaches:

These vary from scheduled lectures, labs and tutorials to studio work, seminars, critiques, workshops and independent study.

Students will be contacted in the pre-arrival period and provided with additional material about their programme.

14. Assessment Methods:

Combination of:

- written assignments
- practical project
- presentations
- written examinations
- Assignments
- technical reports
- Design Process Journal

Engagement with formative assessment is a mandatory requirement.

15. Relevant QAA Subject Benchmark Statements and Other External or Internal Reference Points:

GSA Strategic Plan
GSA Learning and Teaching Enhancement Strategy
SCQF Level 11 Descriptor

16. Additional Relevant Information:

Support for students is provided by the Postgraduate/Undergraduate Adviser(s) of Studies supported by University resources such as the Effective Learning Adviser located in the Student Learning Service (www.gla.ac.uk/services/tls/sls/),
the Student Counselling and Advisory Service (www.gla.ac.uk/services/counselling/),
the Student Disability Service (www.gla.ac.uk/services/studentdisability/) and
the Careers Service (www.gla.ac.uk/services/careers/).
Support information from the Glasgow School of Art, www.gsa.ac.uk

Please refer to the University Calendar for the full PGT regulations:
https://www.gla.ac.uk/myglasgow/senateoffice/policies/uniregs/regulations2019-20/gsa/genericpgt/