

# Design Studio Major Thesis Project

## MDD-10

### MODULE DESCRIPTOR

<b>ECTS credits<sup>1</sup></b>	30	<b>Programme</b>	MSc Medical Device Design
<b>NQF level</b>	9	<b>School</b>	School of Design
<b>Stage</b>	1	<b>Module Co-ordinator</b>	Enda O’Dowd
<b>Trimester</b>	Summer	<b>Module Team</b>	Enda O’Dowd & Derek Vallence
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<b>Responsibility</b>	The NCAD Academic Council, and the School of Design have responsibility for this module.		

## 1. Introduction

This module is the final industry collaborative project. This module will allow the student to independently demonstrate the learning they have acquired over the previous two trimesters on a medical device projects they would expect to encounter in industry but in a safe environment where they are allowed to explore different design opportunities and gain experience presenting at different milestones of a project to industry and produce a graduate who are capable of generating new design ideas while also having the ability to analyse those ideas to the rigorous level necessary in the medical device industry.

An industry partner is selected in accordance with the NCAD Medical Device Design collaborative project design guidelines. The industry partner is asked to interact with the project at four stages during the project as follows:

- **Delivering the brief:** The industry partner is requested to provide a brief which is open but has the usual constraints associated with working in the medical devices industry. They are asked to have at least one member of staff deliver the brief to the students. Briefs have to be human centred and are usually open for the students to interpret how they can tackle the problem or unmet clinical need. It is important at this stage that briefs are not incremental changes to a device or a procedure.
- **Research evaluation and feedback:** The industry partner is asked to be available for the student to present their research work. Feedback at this stage will give the student direction on their research insights.
- **Concept Presentation:** Each student produces at least three concepts to answer the design brief. Feedback from the industry partner will be used to evaluate the concepts and decide on the direction for the final design.

<sup>1</sup> European Credit Transfer and Accumulation System, where 60 ECTS credits equate to the workload of a full-time academic year

- Final Presentations: Each student produces a detailed final design presentation. This presentation consists of detailed designs complete with materials, manufacturing methods, product renderings and test rigs used to validate design decisions.

The aims of this module are to:

- Develop graduates who can confidently apply human-centred design within the medical device industry.
- Develop the students' ability to identify insights from robust research and transition these insights into conceptual directions for discussion with industry partners.
- Develop graduates who can work independently on an industry brief.
- Allow students to apply the learnings from modules completed during the previous two trimesters on an industry project.
- Develop the students' confidence in approaching industry.
- Develop the students' ability to present information and ideas in a confident, clear and structured manner.
- Develop a final design proposal based on valid testing and industry feedback.

## 2. What will I learn?

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On successful completion of this module students will be able to:

1. **Research** an industry proposed brief using applied human focused methods and contextual inquiry in collaboration with peers.
2. **Identify** insights and design opportunities from research to aid the development of multiple conceptual directions.
3. **Develop** conceptual routes in an open collaborative manner which are clearly linked to insights and opportunities identified in research.
4. **Validate** design decision making by demonstrating and applying appropriate testing methodologies
5. **Reflect** on feedback from various stakeholders to generate well developed and resolved design proposals.
6. **Specify** appropriate materials and manufacturing processes in accordance with regulatory guidelines.
7. **Present** primary and secondary research, conceptualisation and development in a concise, engaging and visually appealing manner, using industry appropriate tools .

### Module content

This module is delivered for the duration of the third trimester. A range of industry briefs will be proposed. The student in consultation with course coordinators will select a brief. A student can independently identify a brief and industry partner but this will need to be confirmed by the course coordinators before commencement.

This is a studio-based module with the aim of developing independent designers capable of working on industry standard briefs. The project is broken into three identifiable phases: Research, Concept and Final development. The student will organise industry update presentations at these milestones during the trimester. Along with these presentations to industry the student will record and document the entire project in a document, the structure of which will be made available to the student before the project commences.

Phase 1: Each student will identify a range of research areas appropriate to the project brief and independently conduct primary and secondary research to help them identify a large amount of design opportunities. The research is compiled into a large presentation which is delivered to industry partners for review. This portion of the project allows the student to practice the human centred tools and skill sets they have gained in the modules from the preceding two trimesters.

Phase 2: The student will independently reflect on the research finding and identify opportunities to help them construct a variety of conceptual directions which will be presented to the industry partner for discussion and direction finding. Each student will be encouraged to build and test their ideas with appropriate testing methodologies to provide confidence in their decision making.

Phase 3: Final development is conducted independently by the student. In consultation with project partners and tutors, the student is directed toward a conceptual direction with feedback which they must analyse and reflect on. The student is encouraged to develop the idea through further testing and evaluation, with tools or methodologies introduced in preceding two trimesters. The final presentation to industry should be constructed in a manner that is reflective of a medical device designer.

### 3. How will I learn?

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This module will be taught through a combination of studio practice; feedback from industry partners and tutorial guidance from module tutors. This module is an opportunity for the student to be reflective on their learnings from the previous modules and apply the appropriate tools, allowing them to navigate the project in an individual way to a conclusion. Peer to peer discussion and learning is seen as a key tool in their development and they are encouraged to seek direction from their fellow students and also offer advice in areas in which they feel confident. Students will learn to conduct contextual inquiry in a real world environment, leaning on the learnings from the Fundamentals and Human factors modules while using their research to initially produce many conceptual directions and iteratively produce a final design grounded in insights gained through their research and opportunity finding. Students will learn to work through iterative cycles of analysis and synthesis applying deep knowledge in the development of their medical design practice.

<b>Learning tool</b>	<b>Hours</b>
Lectures/Tutorials/Workshops/Reviews	60
Autonomous Student Learning	540
<b>Total Workload</b>	<b>600</b>

#### 4. What learning supports are provided?

Students are guided through the process of human centred research with support in place to enable them to conduct a broad range of primary and secondary research. Workshop materials for this module will be provided. Software used for the production of work will be derived from a combination of student based subscriptions. A personal laptop will be required to run this software.

#### 5. Am I eligible to take this module?

##### Module Requisites and Incompatibles

Pre-requisites	Before studying this module, students must have successfully completed all modules from trimester 1 & 2 (60 credits).
Co-requisites	None
Incompatibles	None
Prior learning	Where a student can demonstrate that they have achieved at least 80% of the learning outcomes of this module, by academic certified achievement, they can apply to the School for that prior learning to be recognised. Applications must be received prior to the commencement of delivery of the module.
Recommended	None

#### 6. How will I be assessed?

Assessment tool	% of final grade	Timing	Learning outcomes assessed
Communication	15%	Module end	7
Research	25%	Module end	1 & 2
Concept	15%	Module end	3
Development	15%	Module end	4
Final Design	30%	Module end	5 & 6
<b>Total</b>	<b>100%</b>		

The assessment will be conducted at the end of the trimester and a summative grade applied. The student will submit a draft thesis report which will detail the project development and conduct a viva presentation.

Each of the assessment tools presented in the above table have assigned learning outcomes. Each of the learning outcomes will be graded using the appropriate NCAD 'Grade descriptors', a copy of the grading and feedback template will be provided to the student at the start of the trimester, this has embedded the NCAD 'Grade descriptors' which will allow the student to see what is required to achieve an A, a B...

Communication - 'Communication & Presentation'

Research - 'Knowledge & Understanding' & 'Organisation & Engagement'

Concept - 'Creativity & Resourcefulness'

Development - 'Application & Realisation'

Final design - 'Application & Realisation' & 'Organisation & Engagement'

## 7. Feedback, results and grading

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This module will be graded in accordance with the standard NCAD grading criteria and will contribute to the overall programme award of PGDip/MSc Medical Device Design.

## 8. What happens if I fail?

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### Resit Opportunities

If you fail this module it is necessary to resit. Alternatively, students who have achieved 60 credits may exit with a postgraduate diploma.

Students can resit or resubmit final projects if appropriate staff are available for supervision and assessment. Resubmitted projects are subject to a pass/fail grade only.

## 9. When and where is this module offered?

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Medical Device Design Studio

Product Design Workshop

Summer Trimester (June to August)

## 10. How will I have the chance to evaluate the module?

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It is important to NCAD that students inform the development of teaching and learning at NCAD. We encourage all students to communicate their concerns and their observations about their study to members of staff so that any changes can be made in a timely manner.

At the end of Trimester 3, students have the opportunity to complete an online evaluation of their study and experience at NCAD. These evaluation events are important to current and future students, to ensure we can enhance the delivery of programmes at NCAD.

In addition, you are invited to discuss your experience on the module with your lecturers at any point during the year. You can also relay your comments to the class student representative who will communicate your comments to the staff.

**For further details on the content of your module and teaching arrangements,  
consult your Programme or Module Handbook**