

Design Studio Collaborative Project 3

MDD-08

MODULE DESCRIPTOR

ECTS credits¹	10	Programme	MSc Medical Device Design
NQF level	9	School	School of Design
Stage	1	Module Co-ordinator	Derek Vallence
Trimester	Spring	Module Team	Enda O’Dowd & Derek Vallence
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Responsibility	The NCAD Academic Council, and the School of Design have responsibility for this module.		

1. Introduction

This module is the third of the industry collaborative projects. Collaborative module projects are employed to introduce the students to 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, building a confidence in their design ability. The student is encouraged to reflect on the project feedback from industry partners and tutors, to help develop them as a human-centred medical device designer.

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 students to present their research work. Feedback at this stage will give the students 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.

¹ 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 and collaboratively as part of a team.
- Allow students to explore the learnings from other modules and apply them to industry projects.
- Introduce students to industry projects and partners, to develop 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?

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 in the second half of the second trimester. It will commence with the introduction of the industry partners and the proposed brief. 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 key phases: Research, Concept and Final development with presentation to industry partners marking the end of each phase.

Phase 1: Research will be conducted in teams, with each team being responsible for a predetermined research topic. This allows the class to quickly break down often complex and new subject matter into more manageable research areas and go deeper, divining a larger amount of design opportunity. The research is compiled into a large presentation which is delivered to industry partners for review but also to the class as a whole so that everyone is aware of the complex nature of the brief. This portion of the project allows the student to practice the tool and skill sets they have gained in the research and human factors modules.

Phase 2: Conceptualisation is conducted independently by the student. 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. Students 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 the human factors and fundamentals modules. The final presentation to industry should be constructed in a manner that is reflective of a medical device designer.

3. How will I learn?

This module will be taught through a combination of studio practice; feedback from industry partners and tutorial guidance with module tutors. Students will learn to work in a multidisciplinary team with students from other backgrounds in the research component but also during the subsequent phases by observing and analysing other students' presentations in a collaborative studio. Students are expected to be critical and reflective of what they see so as to inform their own design practice development. 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 this 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.

Credits

Learning tool	Hours
Lectures/Tutorials/Workshops/Reviews	60
Autonomous Student Learning	140
Total Workload	200

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	None
Co-requisites	Students must have completed the following modules, or be studying them at the same time: <ul style="list-style-type: none"> • Research Methods OR PGVC1001 - Introduction to Research Methods • PGDES1005 Human Factors 1 (Applied Research) • PGDES1004 Fundamentals of Medical Device Design
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
Research Presentation	25%	⅓ through
Concept Presentation	25%	⅓ through
Final Presentation	50%	Module end
Total	100%	

Feedback and formative grades will be generated at each presentation stage: Research, Concept and Final and an overall module summative grade applied at the end of the project. This will be compiled into a feedback sheet which will be given to the student at the end of the module. It is expected that the student will reflect on this feedback to help in their learning.

Each of the presentation stages have assigned learning outcomes which are identified in the ‘Assessment tool’ table below. Each presentation stage learning outcomes will be grade using the appropriate NCAD ‘Grade descriptors’, a copy of the grading and feedback template will be provided to the student at the start of each module, this has embedded the NCAD ‘Grade descriptors’ which will allow the student to see what is required to achieve an A, a B...

For this module the following Grade descriptors headings have been applied to the summative assessment point of Research, Concept and Final presentations:

Research presentation - ‘Knowledge & Understanding’ and ‘Communication & Presentation’

Concept presentation - ‘Knowledge & Understanding’, ‘Creativity & Resourcefulness’, and ‘Communication & Presentation’

Final presentation - ‘Application & Realisation’, ‘Organisation & Engagement’, and ‘Communication & Presentation’

Assessment tool	Learning outcomes assessed
Research Presentation	1, 2, 7
Concept Presentation	2, 3, 4, 7
Final Presentation	4, 5, 6, 7

7. Feedback, results and grading

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?

Resit Opportunities

Opportunities will be provided during or at the end of Trimester 2 to students who do not complete all assessments in Trimester 1, but students will not be able to progress to the next stage of the programme until they have successfully completed all Trimester 1 & 2 modules, equivalent to 60 credits.

9. When and where is this module offered?

Medical Device Design Studio

Product Design Workshop

Spring Trimester (January to May)

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

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.

About two-thirds of the way through the year, a student forum will be convened to gather students’ comments about their study and the delivery of the programme. In addition, at the end of Trimester 2, 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**