WM9N5-15 Product Design

23/24

Department
WMG
Level
Taught Postgraduate Level
Module leader
Ali Ahmad
Credit value
15
Module duration
4 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Product design is an essential aspect of entrepreneurship because it plays a crucial role in determining the success of a business. Effective product design knowledge can help entrepreneurs create products that meet the needs of their target customers and differentiate themselves from competitors. Design, development and introduction of new products is hence the key to the long term competitiveness and survival of start-ups and corporations.

Intensification of competition, rapidly changing technologies and shorter product life cycles, require an integrated approach to management of product development in order to create better quality products with enhanced capabilities, at attractive prices with compressed time to market cycles. Today customers often buy products without making a conscious distinction between tangible product, service or brand.

This module is designed to equip students with the skills and knowledge needed to create innovative and functional products. It offers a curriculum that blends both theoretical and practical instruction, where students will be taken through the complete product design process, including research, ideation, prototyping, and testing. They will also be introduced to design thinking and user-centered design methodologies, which will equip them to create products that are user-friendly and meet the needs of customers.

In addition, students will gain knowledge in material science, manufacturing processes, and

engineering principles. This will allow them to understand the technical aspects of product design, and help them to design products that are not only aesthetically pleasing but also functional and efficient.

Sustainability and ethical considerations in product design will also be addressed, ensuring that students are equipped to create products that are environmentally responsible and ethical.

As a part of the course, students will be required to work on individual and group design tasks. These will allow students to apply their knowledge and skills to real-world challenges, and gain hands-on experience in designing products.

Module aims

This module will provide non-engineering students, and those with little prior background knowledge or experience in the topic, with the knowledge, skills, and expertise necessary to design innovative and functional products that meet the needs of consumers and businesses. Specifically, its aims include:

1. Develop advanced knowledge of the product design process: to provide students with an understanding of the product design process, including advanced research methods, ideation techniques, prototyping and testing strategies, and design management principles.
2. Foster expertise in design thinking and user-centered design: design thinking and user-centered design methodologies will enable students to design products that are not only functional but also emotionally resonant and contextually relevant.
3. Build a range of technical skills: students will build technical skills in material science, manufacturing processes, engineering principles, and other aspects of product design, enabling them to design products that are not only aesthetically pleasing but also functional, efficient, and manufacturable.
4. Foster a sustainability and ethics mindset: enabling students to design products that are environmentally responsible, socially responsible, and ethically sound.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Product development process
Effective Design Management
Lean New Product Introduction
The relationship of tangible product and brand
Management of creativity
Concurrent Engineering
Organisation for effective product design and development
Design protection and intellectual property rights
Case study
Tools, Techniques, and Technologies including;
- Concept generation and Selection

- Design for Assembly/Manufacture
- Life Cycle Costing and Design to Cost
- Design Validation
Industrial Experiences
User / Customer View
Innovative Products

Learning outcomes

By the end of the module, students should be able to:

- Appraise the main features of the product design process
- Create an emotionally resonant and contextually relevant product as a part of a team using appropriate design methodologies
- Apply technical skills to design a product that is functional, efficient and manufacturable
- Design a product as a part of team that is sustainable, ethical and socially responsible
- Apply innovative thinking as a part of a team to generate a novel and feasible product idea designed to solve a specified problem

Indicative reading list

Lockwood, T. (2010). Design Thinking: Integrating Innovation, Customer Experience, and Brand Value. Allworth Press.
Ulrich, K. T., & Eppinger, S. D. (2017). Product Design and Development. McGraw-Hill Education.
Olsen, D. (2015). The Lean Product Playbook: How to Innovate with Minimum Viable Products and Rapid Customer Feedback. Wiley.

Subject specific skills

Ideation and brainstorming: Students will learn how to generate new and innovative product ideas using various ideation and brainstorming techniques.

Research and analysis: Students will learn how to conduct market research, user research, and competitive analysis to identify user needs and market opportunities.

Sketching and prototyping: Students will learn how to create sketches and prototypes of their product ideas using various tools and materials, such as paper, 3D printing, and digital prototyping software.

Design thinking and user-centered design: Students will learn how to apply design thinking and user-centered design methodologies.

Technical design skills: Students will learn how to apply technical design skills in areas such as material science, manufacturing processes, and engineering principles.

Transferable skills

Project management: Students will learn how to manage product design and development projects, including project planning, execution, risk management, and evaluation.

Collaboration and teamwork: Students will learn how to work effectively in teams, including cross-functional teams, multidisciplinary teams, and international teams.

Communication and presentation skills: Students will learn how to effectively communicate and present their design concepts to a variety of audiences, including clients, stakeholders, and users.

Entrepreneurship and business skills: Students will learn how to identify market opportunities, develop business models, and create value propositions, and gain a deep understanding of the product development process from ideation to launch.

Study

Study time

Type	Required
Lectures	6 sessions of 1 hour (4%)
Seminars	16 sessions of 1 hour (11%)
Practical classes	8 sessions of 1 hour (5%)
Online learning (independent)	25 sessions of 1 hour (17%)
Private study	35 hours (23%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

Completing the set design tasks, learning to use design software, readings, podcasts and videos.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time
Group Product Design Project	70%	40 hours

Students allocated in teams of upto 4 will be asked to develop a product design project, from ideation to prototyping, testing, and final validation. The project will be based on a real-world

	Weighting	Study time

design problem, and will be evaluated based on creativity, feasibility, functionality, aesthetics, and user experience. Each student team member will be expected to take ownership of a particular component of the supplied assignment brief. Marking in appropriate weightage will be both individual and group based.

In-Module Design Challenge Presentation	30%	20 hours

Students working in teams will be asked to participate in a design challenge, where they will be assigned a specific design problem and a limited amount of time to come up with a solution. The challenge will be evaluated based on creativity, feasibility, functionality, aesthetics, and user experience.

Assessment group R

	Weighting	Study time
Individual assessed work as specified by department	100%	

Feedback on assessment

Verbal feedback will be provided after case studies / practical workshops, which will be focused upon the learning targets of each session. Feedback will also be provided to any questions which arise from students with the lecture session.

Written feedback will be provided using the standard WMG feedback templates.

Availability

There is currently no information about the courses for which this module is core or optional.