Syllabus

Course Description

Course Title	Product development and design
Course Code	47585
Course Title Additional	
Scientific-Disciplinary Sector	
Language	English
Degree Course	Master in Industrial Mechanical Engineering
Other Degree Courses (Loaned)	
Lecturers	Prof. Yuri Borgianni, Yuri.Borgianni@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/35189
Teaching Assistant	
Semester	First semester
Course Year/s	2
CP	6
Teaching Hours	32
Lab Hours	24
Individual Study Hours	80
Planned Office Hours	18
Contents Summary	The course provides insights into the new trends in product development and design. First, students will be guided in the adoption of a managerial view to understand how to structure an innovation process and how to incorporate the Voice of the Customer (VOC) in new product development decisions. Furthermore, they will learn how to investigate the patterns of consumer decision making through market research, thus better understanding the utility and desirability of new products. Second, they will be able to understand an engineering view of designing industrial products. Here, students will learn best

	practices in generation of new product concepts and their subsequent evaluation, which will take place by means of state-of-the-art systems and methods.
Course Topics	- Product innovation - New product development processes - Voice of the Customer - Conjoint Analysis - Quality Function Deployment - Forecasting techniques for new products - Engineering design cycles - Product planning and specifications - Conceptual design - Design creativity and assessment thereof - Human-product interaction - User Experience - Eye-tracking in design research
Keywords	product development; customer needs; engineering design; human-product interaction
Recommended Prerequisites	none
Propaedeutic Courses	
Teaching Format	Frontal lectures, exercises, laboratory and experimental activities
Mandatory Attendance	Not mandatory, but highly recommended
Specific Educational Objectives and Learning Outcomes	Intended Learning Outcomes (ILO) Knowledge and understanding Students should acquire the knowledge and the understanding of: • New product development process and related concepts • Essential tools and methods for customer involvement in new product development • Tools and approaches for market research in new product development • Engineering design cycles • Creative conceptual design • User Experience in engineering and product design • Systems to test human-product interaction Applying knowledge and understanding • Ability to frame a product development process and its

	governance structure • Ability to apply the Quality Function Deployment tool to a simple product • Ability to properly design a Conjoint Analysis • Ability to understand the main drivers behind product development and design • Ability to meditate about concepts instead of rushing to solutions • Ability to identify the main elements to be tested to allow the appraisal of design ideas and new products • Ability to organize tests aimed to evaluate people's experience with new products Making judgements • Ability to transfer the knowledge and methods learned to real practical applications thanks to groupworks, exercises and simulation of experimental activities within product development and design Communication skills • Ability to prepare, conduct and join interactive discussions in class • Ability to structure, prepare, and present arguments related to product development and design Ability to learn • Ability to autonomously extend the knowledge acquired during the study course by reading and understanding
Specific Educational Objectives and Learning Outcomes (additional info.)	-
Assessment	Written exam to verify the understanding of the contents and practical activities shown during the two modules. The duration of the written exam is 3 hours.
Evaluation Criteria	The mark is calculated as the average between the scores achieved in each single module. The following criteria are taken into consideration for the assignment of the marks:

	• Ability to accurately illustrate concepts about the topics of the course • Clarity of answers • Mastery of specialistic terminology
Required Readings	Lecture notes and documents for exercises will be available on the Microsoft Teams of the course.
Supplementary Readings	Books and articles will be possibly suggested by the lecturers during the course.
Further Information	-
Sustainable Development Goals (SDGs)	Responsible consumption and production, Industry, innovation and infrastructure

Course Module

Course Constituent Title	Product Development
Course Code	47585A
Scientific-Disciplinary Sector	IEGE-01/A
Language	English
Lecturers	Dott. Margherita Molinaro, Margherita.Molinaro@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/43550
Teaching Assistant	
Semester	First semester
CP	3
Responsible Lecturer	
Teaching Hours	16
Lab Hours	12
Individual Study Hours	40
Planned Office Hours	9
Contents Summary	The course provides insights into the new trends in product development and design. First, students will be guided in the adoption of a managerial view to understand how to structure an innovation process and how to

	incorporate the Voice of the Customer (VOC) in new product development decisions. Furthermore, they will learn how to investigate the patterns of consumer decision making through market research, thus better understanding the utility and desirability of new products. Second, they will be able to understand an engineering view of designing industrial products. Here, students will learn best practices in generation of new product concepts and their subsequent evaluation, which will take place by means of state-of-the-art systems and methods.
Course Topics	Customer-oriented product development • New product development process: history and phases • Portfolio management framework • From customer needs to product characteristics: the Quality Function Deployment (QFD) • Open innovation and crowdsourcing Market research for new products • Survey-based market research: the Conjoint Analysis • Forecasting new products: techniques and strategies • The role of crowdfunding
Teaching Format	Frontal lectures and exercises
Required Readings	-
Supplementary Readings	-

Course Module

Course Constituent Title	Engineering and Product Design
Course Code	47585B
Scientific-Disciplinary Sector	IIND-03/B
Language	English
Lecturers	Prof. Yuri Borgianni, Yuri.Borgianni@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/35189 dr. Aurora Berni,

	Aurora.Berni@unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/42284
Teaching Assistant	
Semester	First semester
CP	3
Responsible Lecturer	
Teaching Hours	16
Lab Hours	12
Individual Study Hours	40
Planned Office Hours	9
Contents Summary	The course provides insights into the new trends in product development and design. First, students will be guided in the adoption of a managerial view to understand how to structure an innovation process and how to incorporate the Voice of the Customer (VOC) in new product development decisions. Furthermore, they will learn how to investigate the patterns of consumer decision making through market research, thus better understanding the utility and desirability of new products. Second, they will be able to understand an engineering view of designing industrial products. Here, students will learn best practices in generation of new product concepts and their subsequent evaluation, which will take place by means of state-of-the-art systems and methods
Course Topics	Engineering design • Cycles to design new products • Conceptual design and early design phases • Creativity and other metrics to assess the quality of design outcomes • Stimulation and other treatments to support idea generation Human-Product Interaction • User Experience and product appraisal • Subjective and objective data in product evaluation • Use of eye-tracking in Human-Product Interaction • Hands-on activities to design experiments on Human-Product

	Interaction
Teaching Format	Frontal lectures, laboratory and experimental activities
Required Readings	-
Supplementary Readings	-