



**Jordan University of Science and Technology**  
**Faculty of Engineering**  
**Industrial Engineering Department**

IE561 Product Development - JNQF Level: 7

Second Semester 2023-2024

**Course Catalog**

3 Credit Hours. Product Development is a project-based course that covers modern tools and methods for product design and development. The cornerstone is a project in which teams of students conceive, design and prototype a physical product. Class sessions are conducted in workshop mode and employ cases and hands-on exercises to reinforce the key ideas. Topics include identifying customer needs, concept generation, product architecture, industrial design, and design-for-manufacturing, demands forecasting, inventory management and facility planning.

**Teaching Method:** On Campus

**Text Book**

<b>Title</b>	Axiomatic Design: Advances and Applications
<b>Author(s)</b>	N. P. Suh
<b>Edition</b>	3rd Edition
<b>Short Name</b>	Ref 1
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref 2	Product Design and Development	Ulrich, Karl, and Steven Eppinger	3rd Edition	
Ref 3	The Design of Everyday Thing	Norman, D	2nd Edition	

**Instructor**

Name	<b>Dr. NADER AL THEEB</b>
Office Location	C5-L2
Office Hours	
Email	naaltheeb@just.edu.jo

Class Schedule & Room	
Section 1:	Lecture Time: Mon, Wed : 10:00 - 11:30 Room: M5124
Section 2:	Lecture Time: Mon, Wed : 13:00 - 14:30 Room: M5124

Prerequisites		
Line Number	Course Name	Prerequisite Type
294611	IE461 Mechanics Of Machines	Prerequisite / Study
294680	IE468 Manufacturing Processes (2)	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction and teams forming, Project one kick off	
Week 2	Product life cycle, Identifying market need and target customer,	
Week 3	Customers needs and requirements formulation, Concepts generations methods	
Week 4	Concepts generations methods, Project one 1st presentation ( Proposal )	
Week 5	Concepts selection, engineering specifications, and House of quality	
Week 6	Detailed design, prototype building and usability study	
Week 7	Presentation skills, external speaker/ Shamalstart ( how to startup your business ? ), Project One Final Presentation	
Week 8	Rapid Technologies( AM, Hybrid AM ...etc), Design for AM, DFMA, Project Two Kick off	
Week 9	Design Fixation and mitigation, TRIZ , Packaging Design	
Week 10	Project Two 1st presentation , Manufacturing process selection, Trip to FABLAB	
Week 11	Forecasting demand for new product, Capacity requirements, Inventory management	
Week 12	Facility layout, Project Two submission and presentation	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Class is designed to have two projects. The first project focus on finding problems in one of existing products and then follow systematic design process to solve problems and improves product. The improved product is tested through usability study. The second project focus on identifying a need that is not satisfied and then work on developing a new product to satisfy it. [1SO2] [1L7S3]	50%	
Weekly reports and presentations. Assign in class project related tasks for teams to work on, plan and present on board to facilitate their collaboration and engagement. This class is designed to have two team projects, the team members who worked on the first project are rotated for the second project. This is to prepare and help student fit in any team. [1SO5] [1L7C3]	50%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
	50			50		

Relationship to NQF Outcomes (Out of 100%)	
L7S3	L7C3
50	50

Evaluation	
Assessment Tool	Weight
Assignment	40%
Project 1	20%
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Policy	
Assignment	Student will be given number of assignment during the course. Worth 20% of class grade
Teamwork	Students shall work in groups of 3-4 students each
In class exercises	Students will be asked to perform some in class exercises to enhance understanding of topics discussed in class, such as in class usability study , reverse engineering of a selected product during class time, forming and conducting interviews and surveys. Worth 20% of class grade

Project 1	<p>The first project will be focusing on teaching students the design process phases including problem identification, requirements gathering and formulations, concepts generation and selection, engineering specifications, detailed design, prototype building, usability study and design documentation.</p> <p>In project one, students will pick an existing product that has a set of unmet customer requirement and try to improve it.</p> <p>Worth 20% of class grade</p>
Project 2	<p>In project 2, students are required to come up with a completely new product based on a need that is not met in their surrounding, market,...etc.</p> <p>In addition to design process learnt in project one, students will learn how to select manufacturing processes, forecast demands for new product, do inventory management calculation and capacity requirements and end up planning the facility for their product in project two.</p> <p>Worth 40% of class grade</p>

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