

## Product Design Engineering

### Introduction

Product Design Engineering (PDE) provides stakeholders with the ultimate product design engineering's prioritizing outcome toward the human-centered and the sustainability of the product within realistic constraint. The priorities are aligned with the local wisdom of Industrial Revolution 4.0 (IR 4.0) in Indonesia, recognized as Making Indonesia 4.0. PDE in Binus Aso School Engineering (BASE). It integrates the program Making Indonesia 4.0 with Japanese wisdom of Society 5.0. In wider perspective, PDE in BASE generates a holistic approach of Breakthrough, Agility, Sustainability and Empowerment.

### Vision

To be the most prestigious and dynamic Product Design Engineering program based upon Indonesia and Global wisdom enables the human-centered and sustainable product design for industries and communities as stakeholders through young talented graduates.

### Mission

The missions of Product Design Engineering Program are to:

1. Fostering all young talents, in term of education and enrichment, that contribute to the Indonesia local wisdom, and global prestige and dynamic through Product Design Engineering program.
2. Educate all young talents through an integrated approach of Product Design Engineering program and personal develop through solid manner for perseverance and integrity.
3. Enrich all young talents through effective learning experience within IR 4.0's megatrends of physical, digital and biology as the spearheaded and cutting edge of learning experience.
4. Empowering all young talents to build and serve Indonesia toward industries and communities as stakeholders through prioritizing human-centered and sustainable product design through 5 stages of design thinking approach.
5. Prioritize all young talents to synergize human-centered and sustainable products design through ambidexterity of continuous improvement and breakthrough toward disruptive innovation.

### Program Objective

The objectives of the program are:

1. Utilize appropriate engineering design methods and tools that are principal to work beneficially within their professions & communities.
2. Possess effective teamwork and leadership skills and commit to the standard of the profession and ethical practice.
3. Continuously develop oneself to meet the evolving demands and increasing responsibilities of a successful career, to benefit the organization and society.

### Student Outcomes

After completing the study, graduates are:

1. Able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Able to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Able to communicate effectively with a range of audiences.

4. Able to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Able to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Able to acquire and apply new knowledge as needed, using appropriate learning strategies.

### Prospective Career of the Graduates

- Product Specialist
- Industrial Design Engineer
- Product Development Engineer
- Vehicle Design Engineer
- Process Engineer
- Quality Engineer
- Research and Development (R & D)
- Entrepreneur
- Consulting Firm
- Manufacturers

### Curriculum

Courses in PDE and Design Thinking Framework are designed to enhance and orchestrate the comprehensive theoretical with the industrial implementation to adapt students toward the professional and entrepreneurship of real work challenge in Digital Era. The aforementioned PDE enables the humancentered and sustainable product design for industries and society. This aligns with vision of BINUS University; fostering and empowering Indonesia. The facilities are equipped with computer laboratories and other relevant facilities that comply with the challenge in Digital Era. All facilities are synergized to ensure students toward the challenge in the future within Digital Transformation and Ecosystem building among the need as academicians throughout the study period and as practitioners within the professionals and entrepreneurship stages upon the study completion.

Core A: Math and Basic Science

Core B: Engineering Topics

Core C: Institutional

Core D: Humanities and Social Science

Core E: Creativity and Aesthetic Experience

Core F: Major

### Course Structure

Sem	Code	Course Name	SCU	Total
1	CHAR6016011	Character Building: Pancasila	2	20
	PDEN6027011	Mechanical Drawing and Design	2	
	SCIE6031011	Physics I	4	
	SCIE6037011	Biology	2	
	MATH6098011	Calculus I	4	
	PDEN6028011	Chromatology	2	
	PDEN6025011	Expression Technique I	2	
	PDEN6026011	Introduction to Programming	2	

Sem	Code	Course Name	SCU	Total
2	CHAR6017011	Character Building: Kewarganegaraan	2	20
	PDEN6029011	Image Manipulation Technique	2	
	PDEN6030011	Expression Technique II	2	
	SCIE6060011	Physics II	4/1	
	MATH6100011	Calculus II	4	
	MATH6175011	Chemistry	3	
	STAT6108011	Probability Theory	2	
3	PDEN6005011	Material Science	2	20
	MATH6108011	Linear and Discrete Mathematics	4	
	MATH6107011	Calculus III	4	
	STAT6183011	Applied Statistics	2	
	ISYE6197011	Human-Integrated Systems	2/1	
	ISYE6198011	Deterministic Optimization	3	
	ENTR6589011	Entrepreneurship: Ideation	2	
4	CHAR6018011	Character Building: Agama	2	20
	COMM6094011	Technical Communication	2	
	STAT6184011	Stochastic Process	2	
	PDEN6034011	Intermediate PDE Project	2	
	PDEN6031011	Digital Modeling and Simulation	2/2	
	ISYE6199011	System Engineering & Analysis	2	
	ISYE6110011	Engineering Economy	2	
	ISYE6105011	Leadership and Organizational Behavior	2	
	ENTR6590011	Entrepreneurship: Market Validation	2	
5	PDEN6032011	Introduction to IoT and Machine Learning	2/1	20
	ISYE6200011	Facility Planning	2	
	PDEN6035011	Advanced PDE Project	1/2	
	ISYE6201011	Quality Engineering	3	
	ISYE6202011	Health and Safety Engineering	2	
	ISYE6203011	Production & Operation Analysis	3/1	
	ISYE6204011	Systems Simulation	3	
6	<b>Enrichment Program I</b>		20	20
7	<b>Enrichment Program II</b>		20	20
8	PDEN6033011	Final Project	6	6
			<b>Total Credits 146 SCU</b>	

**Enrichment Program I (6<sup>th</sup> Semester) & Enrichment Program II (7<sup>th</sup> Semester):**

-) *Enrichment Program is a compulsory off-campus enrichment program for all students. Students will take one of the enrichment of choice program tracks (off-campus). See the enrichment appendix for the tracks detail.*

**Enrichment Track Scheme**

Track	Semester 6							Semester 7						
	IN	RS	EN	CD	SA	PP	etc	IN	RS	EN	CD	SA	PP	etc
1	v							v						
2	v									v				
3	v											v		
4	v												v	
5			v					v						
6			v							v				
7			v									v		
8			v										v	
9					v			v						
10					v					v				
11					v							v		
12					v								v	
13						v		v						
14						v				v				
15						v						v		
16						v							v	

**Note:**

IN : Internship  
 RS : Research  
 EN : Entrepreneurship  
 CD : Community Development  
 SA : Study Abroad  
 PP : Professional Practice  
 etc : Study Program Special Purposes

**Description:**

Student will take one of enrichment program tracks

**Certified Internship Track**

Code	Course Name	SCU	Total
<b>Enrichment Program I</b>			20
PDEN6051011	Industrial Design Experience	8	
PDEN6052011	Professional Responsibility I	6	
PDEN6053011	Technical Skills and Soft Skills	6	
<b>Enrichment Program II</b>			20
PDEN6054011	Integrated Product Design	8	
PDEN6055011	Professional Responsibility II	6	
PDEN6042011	Project Management	6	

*Enrichment Program is a compulsory off-campus enrichment program for all students*

**Certified Entrepreneurship Track**

Code	Course Name	SCU	Total
<b>Enrichment Program I</b>			
PDEN6056011	Idea Exploration & Prototype	8	20
PDEN6057011	Product Development Process	6	
PDEN6058011	Business Communication	6	
<b>Enrichment Program II</b>			
PDEN6048011	Professional Responsibility	8	20
PDEN6049011	Business and Product Development	6	
PDEN6043011	Contemporary Business Communication	6	

Enrichment Program is a compulsory off-campus enrichment program for all students

**Certified Professional Practice Track**

Code	Course Name	SCU	Total
<b>Enrichment Program I</b>			
PDEN6059011	Industrial Design Project	8	20
PDEN6060011	Technical & Soft Skills**	6	
PDEN6061011	Sustainability Development**	6	
PDEN6062011	User-Centered Research and Evaluation**	6	
PDEN6063011	Portfolio Design and Exhibition I**	6	
<b>Enrichment Program II</b>			
PDEN6044011	Industrial Project	8	20
PDEN6050011	Integrated Product Design**	6	
PDEN6064011	Portfolio Design and Exhibition II**	6	
PDEN6046011	Social Development Project**	6	
PDEN6047011	Entrepreneurial Project**	6	

Enrichment Program is a compulsory off-campus enrichment program for all students. Student will take one of enrichment program tracks. See enrichment appendix for the track detail. Industrial Project is a compulsory subject.

\*\* Student is required to fulfill 20 sks, by selecting and/or combining subjects

**Certified Study Abroad Track**

Code	Course Name	SCU	Total
<b>Elective courses list for study abroad*</b>			
<b>Enrichment Program I</b>			
GLOB6636011	Elective Course for Study Abroad 1	4	20
GLOB6637011	Elective Course for Study Abroad 2	4	
GLOB6638011	Elective Course for Study Abroad 3	4	
GLOB6639011	Elective Course for Study Abroad 4	4	
GLOB6640011	Elective Course for Study Abroad 5	4	
GLOB6641011	Elective Course for Study Abroad 6	2	
GLOB6642011	Elective Course for Study Abroad 7	2	
GLOB6643011	Elective Course for Study Abroad 8	2	
GLOB6644011	Elective Course for Study Abroad 9	2	
GLOB6645011	Elective Course for Study Abroad 10	2	
GLOB6646011	Elective Course for Study Abroad 11	2	
GLOB6647011	Elective Course for Study Abroad 12	2	

Code	Course Name	SCU	Total
GLOB6648011	Elective Course for Study Abroad 13	2	
GLOB6649011	Elective Course for Study Abroad 14	2	
GLOB6650011	Elective Course for Study Abroad 15	2	
GLOB6651011	Elective Course for Study Abroad 16	3	
GLOB6652011	Elective Course for Study Abroad 17	3	
<b>Enrichment Program II</b>			
GLOB6653011	Elective Course for Study Abroad 18	4	20
GLOB6654011	Elective Course for Study Abroad 19	4	
GLOB6655011	Elective Course for Study Abroad 20	4	
GLOB6656011	Elective Course for Study Abroad 21	4	
GLOB6657011	Elective Course for Study Abroad 22	4	
GLOB6658011	Elective Course for Study Abroad 23	2	
GLOB6659011	Elective Course for Study Abroad 24	2	
GLOB6660011	Elective Course for Study Abroad 25	2	
GLOB6661011	Elective Course for Study Abroad 26	2	
GLOB6662011	Elective Course for Study Abroad 27	2	
GLOB6663011	Elective Course for Study Abroad 28	2	
GLOB6664011	Elective Course for Study Abroad 29	2	
GLOB6665011	Elective Course for Study Abroad 30	2	
GLOB6666011	Elective Course for Study Abroad 31	2	
GLOB6667011	Elective Course for Study Abroad 32	2	
GLOB6668011	Elective Course for Study Abroad 33	3	
GLOB6669011	Elective Course for Study Abroad 34	3	

\*) Transferred courses will be transferred based on credit transfer policies on study program with total of 20 credits.

### The Table of Prerequisite for Product Design Engineering Program

Course	SCU	Sem.	Prerequisite Course	SCU	Sem.
PDEN6033011	6	8	All Core Courses of Industrial Engineering Program and Product Design Engineering Program		

### Student should pass all of these quality controlled courses as listed below:

No.	Course Code	Course Name	Minimal Grade
1.	CHAR6016011	Character Building: <i>Pancasila</i>	B