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

Becoming a world class industrial engineering study program through advanced system and industrial digital transformation to fostering and empowering the society in building and serving the nation.

Mission

The missions of Product Design Engineering Program are to:

1. Developing excellent characters through holistic approach that meets global standards.
2. Resolving the nation's issues in Industrial Engineering field study through high impact research.
3. Fostering BINUSIAN as lifelong learners through self-enrichment in adapting to new system engineering and technology.
4. Empowering BINUSIAN to continuously serve society-based needs through industrial engineering applied technology.
5. Being the main driver to enrich the BINUS Higher Education system by using Industrial Engineering knowledge and technology.

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. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability 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. An ability to communicate effectively with a range of audiences.
4. An ability 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 context.

5. An ability 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. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusion.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Prospective Career of the Graduates

1. Industrial Design Engineer
2. Product Development Engineer
3. Airline Interior Designer
4. Transportation Designer
5. Automotive and Part Designer
6. Automobile Interior Designer
7. Sport Equipment Designer
8. Model Building
9. Lighting Designer
10. Tool and Equipment Designer
11. Process Engineer
12. Quality Engineer
13. Research and Development (R & D)
14. Entrepreneur Curriculum

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 entrepreneurships 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
	PDEN6084011	Mechanical Drawing and Design	2	
	SCIE6031011	Physics I	4	
	SCIE6037011	Biology	2	

Sem	Code	Course Name	SCU	Total
	MATH6098011	Calculus I	4	
	PDEN6025011	Expression Technique I	2	
	COSC6107011	Foundations of Programming and Cloud Computing	2	
	PDEN6029011	Image Manipulation Technique	2	
2	SCIE6060011	Physics II	4/1	20
	MATH6100011	Calculus II	4	
	MATH6175011	Chemistry	3	
	STAT6108011	Probability Theory	2	
	PDEN6030011	Expression Technique II	2	
	ISYE6199011	System Engineering & Analysis	2	
	COSC6013011	Foundations of Artificial Intelligence	2	
3	CHAR6017011	Character Building: Kewarganegaraan	2	22
	PDEN6005011	Material Science	2	
	MATH6108011	Linear and Discrete Mathematics	4	
	MATH6107011	Calculus III	4	
	STAT6183011	Applied Statistics	2	
	ISYE6197011	Human-Integrated Systems	2/1	
	COMM6094011	Technical Communication	2	
	ISYE6198011	Deterministic Optimization	3	
4	CHAR6018011	Character Building: Agama	2	17
	STAT6184011	Stochastic Process **(AIE)**	2	
	PDEN6034011	Intermediate PDE Project	2	
	PDEN6082011	Digital Modeling and Simulation	1/2	
	ISYE6110011	Engineering Economy	2	
	ISYE6105011	Leadership and Organizational Behavior	2	
	LANG6120011	Indonesian	2	
	ENPR6296011	Entrepreneurship: Prototyping	2	
5	PDEN6083011	Design Engineering Features	2	21
	PDEN6035011	Advanced PDE Project	1/2	
	ISYE6201011	Quality Engineering **(AIE)**	3	
	ISYE6203011	Production & Operation Analysis **(AIE)**	3/1	
	ISYE6204011	Systems Simulation	3	
	ISYE6313011	Facility Planning and Safety Engineering **(AIE)**	4	
	ENTR6590011	Entrepreneurship: Market Validation	2	
6	**Enrichment Program I**		20	20
7	**Enrichment Program II**		20	20
8	PDEN6033011	Final Project	6	6
				Total Credits 146 SCU

-) SCU for PDEN6084011, PDEN6025011, PDEN6029011, COSC6107011, PDEN6030011, PDEN6034011, PDEN6083011 are practical courses

-) **(AIE)** *- Artificial Intelligence Embedded*

Enrichment Program I (6th Semester) & Enrichment Program II (7th 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	IS	etc	IN	RS	EN	CD	SA	IS	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			
17		v									v			
18			v								v			
19				v							v			
20					v						v			
21	v											v		
22		v										v		
23			v									v		
24				v								v		
25					v							v		
26						v		v						
27						v			v					
28						v				v				
29						v					v			
30						v						v		
31	v												v	
32		v											v	
33			v										v	
34				v									v	
35					v								v	

Note:

IN : Company Internship
RS : Research Fellowship
EN : Entrepreneurship
CD : Community Impact Internship
SA : Study Abroad
IS : Specific Independent Study
etc : Study Program Special Purposes

Description:

Student will take one of enrichment program tracks

Company Internship Track

Code	Course Name	SCU	Total
Enrichment Program I			20
PDEN6051011	Industrial Design Experience	8	
PDEN6052011	Professional Responsibility I	6	
PDEN6053011	Technical Skills and Soft Skills	6	
Enrichment Program II			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

Entrepreneurship Track

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

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

Research Fellowship Track

Code	Course Name	SCU	Total
Enrichment Program I			20
PDEN6069011	Industrial Design Project I	8	
PDEN6062011	User-Centered Research and Evaluation	6	
PDEN6070011	Analytical and Creative Thinking Skills in Product Design Engineering Research I	6	
Enrichment Program II			20
PDEN6071011	Industrial Design Project II	8	
PDEN6072011	Research Method and Design	6	
PDEN6073011	Analytical and Creative Thinking Skills in Product Design Engineering Research II	6	

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

Community Impact Internship Track

Code	Course Name	SCU	Total
Enrichment Program I			20
PDEN6074011	Social Development Project I	8	
PDEN6061011	Sustainability Development	6	
PDEN6075011	Ethical Professional Practice I	6	
Enrichment Program II			20
PDEN6076011	Social Development Project II	8	
PDEN6077011	Design Thinking for Innovation	6	

Code	Course Name	SCU	Total
PDEN6078011	Ethical Professional Practice II	6	

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

Study Abroad Track

Code	Course Name	SCU	Total
Elective courses list for study abroad*			
Enrichment Program I			
GLOB6636011	Elective Course for Study Abroad 1	4	
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	20
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	
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	
Enrichment Program II			
GLOB6653011	Elective Course for Study Abroad 18	4	
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	20
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.

Specific Independent Study Track

Code	Course Name	SCU	Total
Elective courses list for Specific Independent Study*			20
CSIS6157011	Course Certification	3	
CSIS6158011	Technical Skill Enrichment	4	
CSIS6159011	Industrial Project	9	
CSIS6160011	Soft Skill Enrichment	4	
CSIS6123011	Elective Course for Specific Independent Study 1	4	
CSIS6124011	Elective Course for Specific Independent Study 2	4	
CSIS6125011	Elective Course for Specific Independent Study 3	4	
CSIS6126011	Elective Course for Specific Independent Study 4	4	
CSIS6127011	Elective Course for Specific Independent Study 5	4	
CSIS6128011	Elective Course for Specific Independent Study 6	2	
CSIS6129011	Elective Course for Specific Independent Study 7	2	
CSIS6130011	Elective Course for Specific Independent Study 8	2	
CSIS6131011	Elective Course for Specific Independent Study 9	2	
CSIS6132011	Elective Course for Specific Independent Study 10	2	
CSIS6133011	Elective Course for Specific Independent Study 11	2	
CSIS6134011	Elective Course for Specific Independent Study 12	2	
CSIS6135011	Elective Course for Specific Independent Study 13	2	
CSIS6136011	Elective Course for Specific Independent Study 14	2	
CSIS6137011	Elective Course for Specific Independent Study 15	2	
CSIS6138011	Elective Course for Specific Independent Study 16	3	
CSIS6139011	Elective Course for Specific Independent Study 17	3	

*) *For students who take BINUS specific independent study courses, they should take the first 4 courses on the list above (20 credits). Meanwhile, electives courses 1 to 17 are transferred courses for students who take specific independent study outside BINUS University. 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	Final Project	6	8	PDEN6084011	Mechanical Drawing and Design	2	1
				SCIE6031011	Physics I	4	1
				SCIE6037011	Biology	2	1
				MATH6098011	Calculus I	4	1
				PDEN6025011	Expression Technique I	2	1
				COSC6107011	Foundations of Programming and Cloud Computing	2	1
				PDEN6029011	Image Manipulation Technique	2	1
				SCIE6060011	Physics II	4/1	2
				MATH6100011	Calculus II	4	2
				MATH6175011	Chemistry	3	2
				STAT6108011	Probability Theory	2	2
				PDEN6030011	Expression Technique II	2	2

Course		SCU	Sem.	Prerequisite Course		SCU	Sem.
				ISYE6199011	System Engineering & Analysis	2	2
				PDEN6005011	Material Science	2	3
				MATH6108011	Linear and Discrete Mathematics	4	3
				MATH6107011	Calculus III	4	3
				STAT6183011	Applied Statistics	2	3
				ISYE6197011	Human-Integrated Systems	2/1	3
				COMM6094011	Technical Communication	2	3
				ISYE6198011	Deterministic Optimization	3	3
				STAT6184011	Stochastic Process	2	4
				PDEN6034011	Intermediate PDE Project	2	4
				PDEN6082011	Digital Modeling and Simulation	1/2	4
				ISYE6110011	Engineering Economy	2	4
				ISYE6105011	Leadership and Organizational Behavior	2	4
				PDEN6083011	Design Engineering Features	2	5
				PDEN6035011	Advanced PDE Project	1/2	5
				ISYE6201011	Quality Engineering	3	5
				ISYE6203011	Production & Operation Analysis	3/1	5
				ISYE6204011	Systems Simulation	3	5
				ISYE6313011	Facility Planning and Safety Engineering	4	5

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

No.	Course Code	Course Name	Minimal Grade
1.	CHAR6016011	Character Building: *Pancasila*	B