School of System Design and Intelligent Manufacturing

Program of Industrial Design for International Students (2024)

I. Introduction

The bachelor's degree program in Industrial Design (ID) offered by Southern University of Science and Technology (SUSTech) serves Shenzhen, and cultivates high-level and international innovative industrial design leaders nationwide to meet the demand for high-end innovative and creative design talents in the Guangdong-Hong Kong-Macao Greater Bay Area, help improve the urban cultural soft power and industrial core competitiveness, promote the high-quality development of the innovative industrial design industry, and build an internationally leading cultural innovation and creative city.

This program makes full use of the characteristics of SUSTech and the advantages of the new engineering education (NEE) model developed by the School of System Design and Intelligent Manufacturing (SDIM), to cultivate high-level, international, and wide-ranging industrial design professionals. SDIM emphasizes student-centered, project-based teaching and learning, multi-disciplinary integration, learning by doing, and focuses on cultivating students' self-learning ability, interdisciplinary knowledge application ability and teamwork ability. Guided by this, the constructions of the curriculum, the professional team for teaching, the professional practice teaching conditions, and the professional teaching management system are carried out to promote the coordinated development of professional construction, fully utilize social resources to improve students' practical ability.

The ID program includes the study of product design theory and method, design thinking and system thinking, art and aesthetics, materials and manufacturing process, intelligent manufacturing and advanced design technology and tools, human-computer engineering, interaction and experience design, computing design and design methods. The content covers the training of students' common design thinking in different industries after taking office in the future, as well as

the training of corresponding design technologies for different industries. Learning and creation will explore design themes including but not limited to: life aesthetics and culture, smart home, health care, smart equipment and fashion, etc. Academic subject areas: Mechanical.

Program code: 080205

II. Objectives and Learning Outcomes

1. Objectives

The ID program is oriented towards the future development of innovative industrial design, with a focus on national strategic development in intelligent manufacturing and other fields. It aims to cultivate a solid theoretical foundation of industrial design, along with distinctive professional knowledge encompassing an international vision, design thinking ability, and systems thinking ability. The program aims to develop multidisciplinary knowledge application ability, user and market research skills, proficiency in product development processes and methods, familiarity with project management and system operation, a sense of social responsibility, teamwork spirit, and the ability to engage in innovative design of industrial products in enterprises and institutions. Additionally, graduates will be equipped to undertake professional design in design institutions, scientific research units, and related service and business model design fields. They will also possess expertise in human-computer interaction design, sustainable development design, and other areas related to the development, research, planning, education, and management of composite industrial design.

2. Learning Outcomes

Graduates from this program will be able to systematically master the principles, procedures, modern design expression methods, forms, structures, and material selection in industrial design. They will possess the ability to use professional knowledge and tools to address the relationship between industrial design and the environment, users, market, functions, shapes, colors, structures, materials, and processes. Graduates will be capable of engaging in various product development and design endeavors, with strong practical abilities in high-end equipment, intelligent products and interaction, healthcare, cultural creativity, and social innovation.

Upon completion of the program, graduates should possess the following knowledge and abilities:

(1) Demonstrate strong professional ethics in ID, maintaining a rigorous and realistic scientific attitude, a firm pursuit of innovation and excellence, a strong sense of patriotism and professionalism, social responsibility, and rich humanistic and artistic literacy.

(2) Possess the necessary knowledge of natural and social sciences relevant to ID, and understand the corresponding technical and social development trends.

(3) Systematically master a broad range of basic theoretical knowledge, including mathematics, physics, machinery, automation, electronics, computers, etc., as well as professional knowledge in ID. This primarily includes design thinking and engineering, fundamentals of ID, product design visualization, industrial design history, ergonomics, advanced material technology, computer simulation and design, aesthetics and design psychology, system design and management, etc.

(4) Possess a well-rounded engineering knowledge base and disciplinary expertise.

(5) Demonstrate strong design performance skills, hands-on ability, aesthetic appreciation, creativity, and proficiency in computer, Internet, multimedia, and foreign language applications.

(6) Possess the ability to analyze, identify, and solve problems based on an understanding of societal and consumer needs. Graduates should be able to participate in the planning, design, operation, and maintenance of the entire life cycle of products or services.

(7) Possess strong information acquisition and career development learning abilities, and be aware of the development trends and theoretical frontiers in ID.

(8) Possess effective design and management abilities, interdisciplinary communication skills, teamwork abilities, and the capacity to handle crises and emergencies.

(9) Possess a certain level of international vision and preliminary abilities to communicate, compete, and cooperate in a cross-cultural environment.

III. Study Length, Degree, and Graduation Requirements

1. Study length: 4 years.

2. Degree conferred: Students who complete and meet the degree requirements of the undergraduate program will be awarded a bachelor's degree in Engineering.

3. The minimum credit requirement for graduation: 164 credits. The specific requirements are as follows.

<table>
<tr><th colspan="2">Module</th><th>Category</th><th>Minimum Credit Requirement</th></tr>
<tr><td rowspan="15">General Education Courses</td><td>Chinese Language and Culture Module</td><td>Chinese Language and Culture</td><td>16</td></tr>
<tr><td rowspan="2">Arts and Physical Education Module</td><td>Physical Education</td><td>4</td></tr>
<tr><td>Arts</td><td>2</td></tr>
<tr><td rowspan="3">Competence Development Module</td><td>Computer Programming</td><td>3</td></tr>
<tr><td>Writing</td><td>2</td></tr>
<tr><td>Foreign Languages</td><td>14</td></tr>
<tr><td rowspan="3">Humanities and Social Sciences Module</td><td>Humanities</td><td rowspan="2">6</td></tr>
<tr><td>Social Sciences</td></tr>
<tr><td>Chinese Studies</td><td>2</td></tr>
<tr><td rowspan="4">Mathematics and Natural Sciences Module</td><td>Mathematics</td><td>12</td></tr>
<tr><td>Physics</td><td>10</td></tr>
<tr><td>Chemistry</td><td>3</td></tr>
<tr><td>Geoscience + Life Science</td><td>3</td></tr>
<tr><td>GE to Majors Bridging Module</td><td>Introduction to Majors</td><td>2</td></tr>
<tr><td rowspan="4">Major Courses</td><td rowspan="3">Major Required Courses</td><td>Major Foundational Courses</td><td>24</td></tr>
<tr><td>Major Core Courses</td><td>30</td></tr>
<tr><td>Practice-based Learning (Undergraduate Thesis, Internships, Research projects, etc.)</td><td>15</td></tr>
<tr><td>Major Elective Courses</td><td>Major Elective Courses</td><td>15</td></tr>
<tr><td colspan="3">Total</td><td>164</td></tr>
<tr><td colspan="4">Note: please see the General Education Requirement for more details on Chinese Language and Culture Module, Arts and Physical Education Module, Competence Development Module（Foreign Languages & Writing）, Humanities and Social Sciences Module, and GE to Majors Bridging Module.</td></tr>
</table>

IV. Course Requirements for the Mathematics and Natural Sciences Module and Computer Programming

Course Category	Course Code	Course Name	Credits	Terms	Prerequisite	Dept.
Mathematics	MA117	Calculus I	4	1 Fall	None	MA
	MA127	Calculus II	4	1Spring	MA117	
	MA113	Linear Algebra	4	1 Spring &Fall	None	
Physics	PHY105	College Physics I	4	1 Fall	None	PHY
	PHY106	College Physics II	4	1 Spring	PHY105	
	PHY104B	Experiments of Fundamental Physics	2	1-2 Spring &Fall	None	
Chemistry	CH105	Chemistry: The Central Science	3	1-2 Spring &Fall	None	CH
Geoscience + Life Science	BIO102B	Introduction to Life Science	3	1-2 Spring &Fall	None	BIO
	EOE100	Introduction to Earth Sciences	3	1-2 Spr. &Fall	NA	ESS, OCE, ESE
Computer Programming	CS112	Introduction to Python Programming	3	1-2 Spring &Fall	None	CS

Note:

1. Calculus I and II can be replaced by Mathematical Analysis I and II.
2. Linear Algebra can be replaced by Advanced Linear Algebra I.
3. College Physics I and II can be replaced by General Physics I and II.
4. The Central Science can be replaced by General Chemistry.
5. Introduction to life sciences can be replaced by Principles of Biology.
6. Students are required to choose one course from the Geoscience + Life Science Category.
7. Introduction to Python Programming can be replaced by Introduction to Computer Programming.
8. The above alternative courses are also applicable to the " Prerequisites for Major Declaration ".
9. The above alternative courses also apply to the prerequisite course requirements.

V. Prerequisites for Major Declaration

Major Declaration Time	Course Code	Course Name	Prerequisite
Declare major at the end of the first academic year	MA117	Calculus I	None
	MA127	Calculus II	MA117
	MA113	Linear Algebra	None
	PHY105	College Physics I	None
	PHY106	College Physics II	PHY105
	CS112	Introduction to Python Programming	None
Declare major at the end of the second academic year	MA117	Calculus I	None
	MA127	Calculus II	MA117
	MA113	Linear Algebra	None
	PHY105	College Physics I	None
	PHY106	College Physics II	PHY105
	CS112	Introduction to Python Programming	None
	PHY104B	Experiments of Fundamental Physics	None
	CH105	Chemistry: The Central Science	None
	BIO102B/EOE100	Introduction to Life Science/Introduction to Earth Sciences	None

Note:

1. If the number of students entering a major at the end of the first academic year in the department is greater than or equal to the total number of the teaching-research faculty (PI)*2*60%, all majors in the department may implement the prerequisites for major declaration at the end of the second academic year.
2. If the number of students entering a major at the end of the first academic year in the department is less than the total number of the teaching-research faculty (PI)*2*60%, all majors in the department do not implement the prerequisites for major declaration at the end of the second academic year.
3. Suppose the number of students applying for a major at the end of the first academic year exceeds four times the total number of the teaching-research faculty (PI), then the department may select students according to predetermined rules. In principle, the rules set by the department shall examine the students' suitability for the major and not based on weighted GPA (Specific rules shall be set by the department and announced in advance).
4. For departments that do not implement prerequisites for major declaration at end of the second academic year, if the cumulative number of students applying for a major at the end of the second academic year and the number of students who have entered a major at the end of the first academic year exceeds four times the total number of the teaching-research faculty (PI), the department may select students according to predetermined rules. In principle, the rules set by the department shall examine the students' suitability for the major and not based on weighted GPA (Specific rules shall be set by the department and announced in advance).

VI: Major Course Arrangement

Table 1: Major Required Courses

Program of Industrial Design

Course Category	Course Code	Course Name	Credits	Practice-based Learning Credits	Terms	Prerequisite	Dept.
Major Foundational Courses	SDM216	CAD:3D Modeling and Programming	3	3	2 Fall	None	SDIM
	SDM214	Fundamentals of Industrial Design	3	1	2 Fall	None	SDIM
	SDM213	Industrial Design History	3	1	2 Fall	None	SDIM
	SDM283	Mechanics for Design	3	1	2 Fall	MA127	SDIM
	SDM241	Electronic System Design	3	1	2 Spring	PHY106	SDIM
	SDM262	Fundamentals of Materials Engineering	3	1	2 Spring	None	SDIM
	SDM275	Rapid Prototyping for Product Development	3	1	2 Spring	None	SDIM
	SDM322	Product Quality Management	3	1	3 Fall	None	SDIM
	Total		24	10			
Major Core Courses	SDM212	Design Thinking and Engineering	3	1	2 Spring	None	SDIM
	SDM232	Mechanical Design and Manufacturing I	3	1	2 Spring	None	SDIM
	SDM218	Design Psychology and Aesthetics	3	1	2 Fall	None	SDIM
	SDM224	Fundamentals of System Engineering	3	1	2 Fall	None	SDIM
	SDM352	Computer Simulation and Design	3	1	3 Spring	None	SDIM
	SDM311	Thematic Product Design	3	1	3 Spring	SDM216 SDM114	SDIM
	SDM314	Fundamentals of Control Engineering and Design	3	1	3 Spring	SDM283	SDIM
	SDM354	Human Factors	3	1	3 Spring	CS112	SDIM

		Engineering					
	SDM313	Design for Intelligent Manufacturing	3	1	3 Fall	None	SDIM
	SDM315	Computational Design	3	1	3 Fall	None	SDIM
	Total		30	10			
Practice-based Courses	SDM406	Innovation Design Practice	3	3	3 Summer & 4 Fall	None	SDIM
	SDM491	Capstone	12	12	3 Spring	None	SDIM
	Total		15	15			
Total			69	35			
Note: Students who have completed COE491 Comprehensive Design Ⅰ and COE492 Comprehensive Design Ⅱ are not required to take theSDM491 Capstone.							

Table 2: Major Elective Courses

Program of Industrial Design

Course Code	Course Name	Credits	Practice-based Learning Credits	Terms	Prerequisite	Dept.
SDM102	Integrative System Design	3	3	1 Summer	None	SDIM
SDM116	Experience Design	3	1	1 Spring	None	SDIM
SDM316	Product Function and Mechanism	3	1	3 Fall	None	SDIM
SDM318	Interactive Media Design	3	1	3 Fall	None	SDIM
SDM392	Virtual Product Design and Analysis	3	1	3 Fall	None	SDIM
SDM394	Information Design	3	1	3 Fall	None	SDIM
SDM396	Product Innovation Design	3	1	3 Fall	SDM114	SDIM
SDM414	Industrial Design Professional Practices	3	1	3-4 Fall	Had got 100 credits and had finished at least 2 design stream major elective courses.	SDIM
SDM391	Interactive Design	3	1	3 Spring	SDM114	SDIM
SDM395	Product System Design	3	1	3 Spring	SDM114	SDIM
SDM317	Product Packaging and Advertising Design	3	1	3 Spring	SDM114	SDIM
SDM319	Product Branding and Entrepreneurship	3	1	3 Spring	SDM114	SDIM
SDM393	New Product Development and Design	3	1	3 Spring	None	SDIM
SDM412	Wearable Technology and Design	3	1	3-4 Spring	SDM212	SDIM
ME313	Product Design Practice	2	2	3 Spring & Summer	SDM232	ME

DS363	Design and Learning with Data	3	0	3 Spring	None	DS
ME405	Innovative Design Theory and Practice	3	1	4 Fall	ME313	ME
Above courses are the Design stream major elective courses.		50	19			
SDM372	Intelligent Manufacturing and Equipment	3	1	3 Fall	SDM232	SDIM
SDM371	Big Data [2]	3	1	3 Fall	MA113	SDIM
SDM376	Introduction to Internet of Things [3]	3	1	3 Fall	CS112 MA127 MA113	SDIM
SDM5002	Intelligent Sensing Systems in Mobile Robots [4]	3	1	3 Fall	EE104 CS112	SDIM
SDM374	Machine Learning System Design [1]	3	1	3 Spring	MA113	SDIM
SDM378	Computer Vision and Application [5]	3	1	3 Spring	CS112 MA127 MA113	SDIM
SDM375	Intelligent Robot Design [6]	3	1	3 Spring	CS112	SDIM
SDM373	Sensor and Intelligent Detection Technology	3	1	3 Spring	None	SDIM
SDM472	Additive Manufacturing Technology	3	1	4 Fall	SDM232	SDIM
SDM474	Advanced Design-Manufacture Integrated Technique	3	1	3-4 Fall	SDM262 SDM283	SDIM
SDM5001	Failure Mechanisms of Polymers in Microelectronic Packages	3	1	3-4 Fall	SDM262	SDIM
SDM471	AR / VR and Its Application	3	1	4 Spring	CS112	SDIM
Above courses are the Intelligent Manufacturing stream major elective courses.		36	12			
MA212	Probability and Statistics	3	0	2 Fall	MA127	ME
SDM274	AI and Machine Learning [7]	3	0	2 Fall	MA127 MA113	SDIM
CS203	Data Structures and Algorithm Analysis	3	1	2 Fall	CS109	CS
CS303	Artificial Intelligence	3	1	3 Fall	CS109 CS203 MA212	CS
CS324	Deep Learning	3	1	3 Spring	CS303	CS
Above courses are the Artificial Intelligence stream major elective courses.		18	4			
ME331	Robot Modeling and Control	3	0	3 Fall	MAE203B	ME
ME322	Robotic Actuation System	3	1	3 Fall	MA127	ME
SDM357	Computer Networking and its Industrial Application	3	0.5	3 Fall	None	SDIM
ME336	Collaborative Robot Learning	3	1	3 Spring	ME331	ME
SDM365	Robot Motion Control	3	1	3 Spring	MA127 MA113	SDIM
SDM358	Microcomputer and	3	1	3 Spring	SDM244	SDIM

	Embedded Systems					
SDM5008	Advanced Robot Control	3	1	4 Fall	SDM271 SDM263	SDIM
Above courses are the Robotic stream major elective courses.		21	5.5			
Total		125	40.5			

Note:
[1] SDM374 Machine Learning System Design can be used as an elective course for Artificial Intelligence stream at the same time.
[2] SDM371 Big Data can be used as an elective course for Artificial Intelligence stream at the same time.
[3] SDM376 Introduction to Internet of Things can be replaced by course CS314 Internet of Things.
[4] SDM5002 Intelligent Sensing Systems in Mobile Robots can be used as an elective course for Robotic stream at the same time.
[5] SDM378 Computer Vision and Application can be used as an elective course for Robotic stream and Artificial Intelligence stream at the same time.
[6] SDM375 Intelligent Robot Design can be used as an elective course for Robotic stream at the same time.
[7] SDM274 AI and Machine Learning can be used as an elective course for Robotic stream at the same time.

Table 3: Overview of Practice-based Learning

Program of Industrial Design

Course Code	Course Name	Credits	Practice-based Learning Credits	Terms	Prerequisite	Dept.
SDM102	Integrative System Design	3	3	1 Summer	None	
SDM114	Product Design Visualization	3	1	1 Spring & Fall	None	SDIM
SDM116	Experience Design	3	1	1 Spring	None	SDIM
SDM216	CAD:3D Modeling and Programming	3	3	2 Fall	None	SDIM
CS203	Data Structures and Algorithm Analysis	3	1	2 Fall	CS109	CS
CS203B	Data Structures and Algorithm Analysis B	3	1	2 Fall	CS109	CS
SDM283	Mechanics for Design	3	1	2 Fall	MA127	SDIM
SDM218	Design Psychology and Aesthetics	3	1	2 Fall	None	SDIM
SDM213	Industrial Design History	3	1	2 Fall	None	SDIM
SDM214	Fundamentals of Industrial Design	3	1	2 Fall	None	SDIM
SDM224	Fundamentals of System Engineering	3	1	2 Fall	None	SDIM
SDM212	Design Thinking and Engineering	3	1	2 Spring	None	SDIM
SDM232	Mechanical Design and Manufacturing I	3	1	2 Spring	None	SDIM
SDM241	Electronic System Design	3	1	2 Spring	PHY106	SDIM
SDM262	Fundamentals of Materials Engineering	3	1	2 Spring	None	SDIM
SDM275	Rapid Prototyping for Product Development	3	1	2 Spring	None	SDIM

SDM318	Interactive Media Design	3	1	3 Fall	None	SDIM
SDM392	Virtual Product Design and Analysis	3	1	3 Fall	None	SDIM
SDM396	Product Innovation Design	3	1	3 Fall	SDM114	SDIM
SDM316	Product Function and Mechanism	3	1	3 Fall	None	SDIM
SDM394	Information Design	3	1	3 Fall	None	SDIM
SDM372	Intelligent Manufacturing and Equipment	3	1	3 Fall	SDM232	SDIM
SDM376	Introduction to Internet of Things	3	1	3 Fall	CS112 MA127 MA113	SDIM
SDM371	Big Data	3	1	3 Fall	MA113	SDIM
SDM313	Design for Intelligent Manufacturing	3	1	3 Fall	None	SDIM
SDM322	Product Quality Management	3	1	3 Fall	None	SDIM
SDM5002	Intelligent Sensing Systems in Mobile Robots	3	1	3 Fall	EE104 CS112	SDIM
CS303	Artificial Intelligence	3	1	3 Fall	CS109 CS203 MA212	CS
CS324	Deep Learning	3	1	3 Spring	CS303	CS
SDM315	Computational Design	3	1	3 Fall	None	SDIM
SDM357	Computer Networking and its Industrial Application	3	0.5	3 Fall	None	SDIM
SDM365	Robot Motion Control	3	1	3 Spring	MA127 MA113	SDIM
SDM358	Microcomputer and Embedded Systems	3	1	3 Spring	SDM244	SDIM
SDM314	Fundamentals of Control Engineering and Design	3	1	3Spring	SDM283	SDIM
SDM354	Human Factors Engineering	3	1	3 Spring	CS112	SDIM
SDM352	Computer Simulation and Design	3	1	3 Spring	None	SDIM
SDM374	Machine Learning System Design	3	1	3 Spring	MA113	SDIM
SDM378	Computer Vision and Application	3	1	3 Spring	CS112 MA127 MA113	SDIM
SDM391	Interactive Design	3	1	3 Spring	SDM114	SDIM
SDM375	Intelligent Robot Design	3	1	3 Spring	CS112	SDIM
SDM373	Sensor and Intelligent Detection Technology	3	1	3 Spring	None	SDIM
SDM395	Product System Design	3	1	3 Spring	SDM114	SDIM
SDM317	Product Packaging and Advertising Design	3	1	3 Spring	SDM114	SDIM
SDM319	Product Branding and Entrepreneurship	3	1	3 Spring	SDM114	SDIM
ME313	Product Design Practice	2	2	3 Spring & Summer	SDM232	SDIM
ME336	Collaborative Robot Learning	3	1	3 Spring	ME331	SDIM
SDM393	New Product Development and Design	3	1	3 Spring	None	SDIM
SDM412	Wearable Technology and Design	3	1	3-4 Fall	SDM212	SDIM

SDM414	Industrial Design Professional Practices	3	1	3-4 Fall	Had got 100 credits and had finished at least 2 design stream major elective courses.	SDIM
SDM474	Advanced Design-Manufacture Integrated Technique	3	1	3-4 Fall	SDM262 SDM283	SDIM
SDM5001	Failure Mechanisms of Polymers in Microelectronic Packages	3	1	3-4 Fall	SDM262	SDIM
SDM472	Additive Manufacturing Technology	3	1	4 Fall	SDM232	SDIM
ME405	Innovative Design Theory and Practice	3	1	4 Fall	ME313	ME
SDM5008	Advanced Robot Control	3	1	4 Fall	SDM271 SDM263	SDIM
SDM471	AR / VR and Its Application	3	1	4 Spring	CS112	SDIM
SDM406	Innovation Design Practice	3	3	3 Summer & 4 Fall	None	SDIM
SDM491	Capstone	12	12	4 Spring	None	SDIM
Total		179	74.5			

Curriculum Structure of Industrial Design