Instructive Cultivation Plan for the Program of Industrial Design

(Grade 2020)

Program code: 080205

1. Orientation

The undergraduate program of industrial design is based on engineering science, focuses on the fields of equipment and tool manufacturing, intelligent manufacturing, information and home appliances, faces the enterprise and society, takes the market as the goal, and aims at cultivating compound innovative talents who have the mastery of industrial design theory and knowledge, the ability to design practical operation and design, and innovative ability.

2. Cultivation Objective

2.1. General Objective

This program cultivates application-oriented design and management talents who have a sense of social responsibility, design innovation awareness and innovation capabilities, master industrial design theories and skills, have relatively solid basic knowledge of engineering technology and computer-aided design capabilities, and can be engaged in industrial product design.

2.2. Cultivation Value

This program has a teaching objective of “three in one” of value shaping, ability training, and knowledge transfer. The program takes socialist core values and Chinese excellent cultural heritage as the soul and main line, professional skills and knowledge as the carrier, and emphasizes value guidance in knowledge transfer. It will cultivate students' good professional ethics, professional discipline and professional responsibility.

3. Requirement for Graduation

3.1. Ideological, political and moral education requirements:have a strong sense of social responsibility and design ethics, good physical and psychological literacy, empathy, concentration and resilience.

3.2. Knowledge requirements:master the theories and methods of industrial design, systematic thinking methods, interdisciplinary thinking methods, and basic knowledge of humanities and art disciplines.

3.3. Ability requirements:have a strong sense of innovation and design, collaboration and communication, creative expression, three-dimensional space creation and quantitative construction, engineering ability with design realization as the objective and practical application ability.

3.4. Cognition requirements:self-discipline, self-reflection and lifelong learning awareness

Adapted career positions:

1). Engage in product development design and management in the product development department of small and medium-sized enterprises;

2). Engage in product planning, development and design in industrial design companies and product design companies;

3). Start a business independently or jointly and become a freelance designer.

4. Schooling System

Four-year undergraduate education

5. Length of Study

Generally four years. The length of schooling can be flexible from no less than three years to no longer than six years.

6. Requirements for Graduation and Degree Conferring

Students of this program must complete the minimum credits required for each category of courses and complete all the content specified in extracurricular class according to the requirements of the instructional training plan, and the total credits must reach 152 credits for graduation; those who meet the requirements for bachelor's degree can be conferred bachelor degree in engineering.

7. Discipline

Design Science, Mechanical Engineering.

8. Core Courses

8.1. Design Sketch

Through the study of this course, students will be trained to closely combine the observation, understanding and performance methods by using the eyes, brain, and hands, and train the use of lines and perspective laws to accurately express the relationship between form, material and structure. This course will cultivate students' aesthetic awareness through the training of picture composition.

8.2. Design Graphics

This course studies the application of various projection theories and technical drawings, and trains students to master the drawing methods and specifications of basic mechanical drawings and architectural drawings. Through the study of this course, students will be good at using various patterns to communicate with customers and understand the technical and technological requirements on the patterns; be able to reasonably reflect the three-dimensional shape of the design concept with two-dimensional plane graphics. The course emphasizes the combination of theoretical study and practical exercises, and focuses on the cultivation of students' standard drawing and hand-drawing skills.

8.3. Constitution of Design

This course mainly cultivate students' ability to observe and express the form, color, texture, composition, and beauty through the training of basic elements such as plane, three-dimensional, color, etc. Through the study of this course, students will be able to use the rules of composition, cultivate spatial perception and intuitive judgment, and lay a foundation for subsequent product design.

8.4. Design Thinking and Expression

This course mainly improves students' expression ability and creativity, uses graphical thinking methods to inspire students to actively improve product creativity, strengthens the logical

attributes of design, focuses on innovative thinking training, and trains the students to obtain creative new methods for solving problems.

8.5. Computer Aided Industrial Design 1

Through the teaching of this course, students will be proficient in the use of Rhino and KeyShot professional software. The key contents of this course are computer-aided industrial design technology based on Rhino software, so that students can master the NURBS curve modeling skills through learning and achieve industrial-level 3D design. At the same time, this course will achieve the purpose of product rendering performance through the KeyShot renderer and graphic design software.

8.6. Design method and principle

Through the study of this course, students will understand the methods and principles of design, thus laying the theoretical foundation of design ideas for future product system design and development. This course will enable students to establish the ideological concepts with multiple complex attributes such as scientific, systematic, economical, artistic, human-machine, and social in product design.

8.7. Ergonomics

Through the study of this course, students will be able to understand and master the relative relationships and reasonable scales of people, appliances and environments that need to be solved in the product design process, and improve the comfort, rationality and efficiency of people in the process of using products. This course will cultivate students' human-oriented industrial design concepts, enable them to understand the ergonomic design principles and codes in industrial design, and be able to analyze and design products by using ergonomics principles.

8.8. Product form design

Through the study of this course, students can understand the concept, level and value of product form semantics, basically master the semantic features, thinking, methods and typical characteristics, and have a preliminary understanding of the general process of product form semantic design and application, and can use this to guide product form semantics design practice.

8.9. Material and molding process

Familiarity with materials and even easy handling is a manifestation of the designer's level. This course mainly teaches the properties and characteristics of various materials commonly used in design. Through the study of this course, students will master the molding process and methods of commonly used materials, and understand the application of new materials and new processes in design. Through visiting activities, students will further deepen the perceptual understanding of materials, processes and molding methods.

8.10. Product Design Course Group

This course group mainly enables students to master the knowledge, principles and skills of product design, cultivates the basic abilities of students to discover, analyze, and solve problems, and further improves students’ design expression, performance and comprehensive design abilities, so that students will be improved in knowledge, sensation, creation, aesthetics and design skills. The course group is divided into three courses:product design I (information products), product design II (tools and equipment products), and product design III (household appliances). Each course completes the corresponding design topic in the teaching process.

9. Practical Training (Related courses)

Material modeling C, basic engineering training D, professional cognition practice, model making, graduation design (thesis)

10. Course Structure and Course Hours (excluding extracurricular class)

Category	Total Credit	%	Total Course Hours	Theory Learning	Practical Training
General Education	36.5	24	720	688	32
Basic Course	40.5	27	648	236	412
Professional Course	49.5	33	792	296	496
Practical Training	14.5	9	496	16	480
General Course	10	7	160	160	0
Total	151	100	2816	1396	1420
Theory :Practice(%)	50:50				

11. Teaching Schedule (1)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
General Education	Required	School of Marxism	b1080001	Basic principles of Marxism	Test	3	48	42	6	Autumn semester 1
	Required	School of Marxism	b1080003	Ideological and moral cultivation and legal foundation	Non-test	3	48	42	6	Autumn semester 1
	Required	School of Marxism	b1080006	Outline of Chinese Modern History	Non-test	3	48	42	6	Spring semester 1
	Required	School of Marxism	b1080004	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics I	Test	3	48	42	6	Autumn semester 2
	Required	School of Marxism	b1080007	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics II	Test	2	32	28	4	Spring semester 2
	Required	School of Marxism	-----	Situation and Policy (Module 1～4)	Non-test	2	32	28	4	Autumn semester 1～Spring semester 2
	Required	School of Marxism	b1080008	Labor Education A	Non-test	0.5	16	16		Spring semester 1
	Required	College of Arts and Sciences	b1020084	Advanced Mathematics C	Test	4	64	64		Autumn semester 1
	Required	College of Arts and Sciences	b1020018	College Chinese	Non-test	2	32	32		Autumn semester 1
	Required	Department of Physical Education	-----	Physical Education I～VI	Non-test	3	160	160		Autumn semester 1～Autumn semester 4
	Required	Others	b1110003	Military skills	Non-test	0.5	2W			Autumn semester 1
	Required	College of Arts and Sciences	b1110002	Military theory	Non-test	0.5	32	32		Spring semester 1
	★English	Module A	b1020003	General English III	Test	3	48	48		Autumn semester 1
			b1020004	General English IV	Test	3	48	48		Spring semester 1

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
	(Selective, 1 module, 10 credits)		b1020005	General Academic English A	Test	2	32	32		Autumn semester 2
			---	English development	Non-test	2	32	32		Spring semester 2
		Module B	b1020002	General English II	Test	3	48	48		Autumn semester 1
			b1020003	General English III	Test	3	48	48		Spring semester 1
			b1020006	General Academic English B	Test	2	32	32		Autumn semester 2
			---	English development	Non-test	2	32	32		Spring semester 2
		Module C	b1020001	General English I	Test	4	64	64		Autumn semester 1
			b1020002	General English II	Test	3	48	48		Spring semester 1
			b1020003	General English III	Test	3	48	48		Autumn semester 2
	★ German	College of Arts and Sciences	b1020040	German I	Test	3	48	48		Autumn semester 1
		College of Arts and Sciences	b1020041	German II	Test	3	48	48		Spring semester 1
		College of Arts and Sciences	b1020042	German III	Test	4	64	64		Autumn semester 2
	★ Japanese	College of Arts and Sciences	b1020077	Japanese I	Test	3	48	48		Autumn semester 1
		College of Arts and Sciences	b1020078	Japanese II	Test	3	48	48		Spring semester 1
		College of Arts and Sciences	b1020079	Japanese III	Test	4	64	64		Autumn semester 2
Sub-total (General Education)						**36.5**	**720**	**688**	**32**	
General Course	Selective	Others	b0-----	Social Science and Humanities Literacy (4 credits) Natural Science and Technological Innovation (4 credits) Other optional(2 credits)	Non-test	10	160	160		Autumn, Spring
Sub-total (General Course)						**10**	**160**	**160**	**0**	

(★Note:The first foreign language has a total of 10 credits, including College English, German, and Japanese. Choose the appropriate language according to your needs; among them, if you choose College English, please choose the appropriate module in module ABC)

11. Teaching Schedule (2)

Category	Type	Provided by	Course Code	Ability module	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
Basic Course	Required	School of Applied Art and Design	b2041098	Professional basic ability	Design concept	Test	2	32	20	12	Autumn semester 1
	Required	School of Applied Art and Design	b2041107		Design Sketch	Test	4	64	12	52	Autumn semester 1
	Required	School of Applied Art and Design	b2041099		Constitution of Design A	Test	3	48	12	36	Spring semester 1
	Required	School of Applied Art and Design	b2041100		Constitution of Design B	Test	2.5	40	16	24	Autumn semester 2
	Required	School of Applied Art and Design	b2041172		Photography basics A	Non-test	1	16	4	12	Spring semester 1
	Required	School of Applied Art and Design	b2041173		Photography basics B	Non-test	1	16	4	12	Autumn semester 2
	Required	School of Applied Art and Design	b2041174		Professional photography	Non-test	1	16	4	12	Spring semester 2
	Sub-total						14.5	232	72	160	
	Required	School of Applied Art and Design	b2041108	Design expression ability	Design Graphics	Test	4	64	48	16	Spring semester 1
	Required	School of Applied Art and Design	b2041175		Design Sketch	Test	3	48	8	40	Summer semester 1
	Required	School of Applied Art and Design	b2041010		PHOTOSHOP	Non-test	2	32	12	20	Autumn semester 2
	Required	School of Applied Art and Design	b2041007		ILLUSTRATOR	Test	2	32	8	24	Autumn semester 2
	Required	School of Applied Art and Design	b2041153		Design Thinking and Expression	Test	4	64	20	44	Spring semester 2
	Required	School of Applied Art and Design	b2041066		Computer Aided Industrial Design 1	Test	5	80	32	48	Spring semester 2
	Required	School of Applied Art and Design	b2041043		Product form design	Test	3	48	20	28	Autumn semester 3

	Selective 3points	School of Applied Art and Design	b2041176		Orchestration design A	Test	1.5	24	8	16	Spring semester 1
		School of Applied Art and Design	b2041177		Orchestration design B	Test	1.5	24	8	16	Autumn semester 2
		School of Applied Art and Design	b2041151		Font and graphic design	Non-test	3	48	16	32	Autumn semester 2
	Sub-total						**26**	**416**	**164**	**252**	
	Sub-total (Basic Course)						**40.5**	**648**	**236**	**412**	

11. Teaching Schedule (3)

Category	Type	Provided by	Course Code	Ability module	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
Professional Course	Required	School of Applied Art and Design	b2041026	Engineering technology application ability	Material and molding process	Test	2.5	40	14	26	Spring semester 2
	Required	School of Applied Art and Design	b2041178		Industrial Design Engineering Foundation	Non-test	3	48	32	16	Spring semester 3
	Required	School of Applied Art and Design	b2041067		Computer Aided Industrial Design 2	Test	4.5	72	24	48	Autumn semester 4
	Sub-total						**10**	**160**	**70**	**90**	
	Required	School of Applied Art and Design	b2041154	Market user research capabilities	Market research and marketing strategy	Non-test	2	32	20	12	Spring semester 3
	Selective 2 credits	School of Applied Art and Design	b2041102		Design management	Non-test	2	32	24	8	Spring semester 3
		School of Applied Art and Design	b2041110		Design Psychology	Non-test	2	32	24	8	Spring semester 3
	Sub-total						**4**	**64**	**44**	**20**	
	Required	School of Applied Art and Design	b2041097	Professional design ability	Design method and principle	Test	2.5	40	12	28	Autumn semester 3
	Required	School of Applied Art and Design	b2041088		Ergonomics	Test	2.5	40	16	24	Autumn semester 3
	Required	School of Applied Art and Design	b2041076		Interactive Design	Non-test	2	32	16	16	Autumn semester 3
	Required	School of Applied Art and Design	b2041037		Product design Ⅰ	Test	5	80	24	56	Autumn semester 3
	Required	School of Applied Art and Design	b2041038		Product design Ⅱ	Test	5	80	24	56	Spring semester 3
	Required	School of Applied Art and Design	b2041039		Product design Ⅲ	Test	5	80	24	56	Autumn semester 4
	Required	School of Applied Art and Design	b2041159		Thematic design	Non-test	3	48	18	30	Spring semester 3
	Required	School of Applied Art	b2041179		Professional comprehensive	Non-test	2	32	8	24	Autumn

		and Design			expression						semester 4
	Sub-total						27	432	142	290	
	Required	School of Applied Art and Design	b2041160	Diversified design capabilities	Furniture design	Test	3	48	20	28	Summer semester 3
	Required	School of Applied Art and Design	b4000040		Industrial design program innovation and entrepreneurship	Non-test	2	32	0	32	Autumn semester 4
	Selective 3.5 credits	School of Applied Art and Design	b2041180		Exhibition Design A	Non-test	1.5	24	8	16	Autumn semester 3
		School of Applied Art and Design	b2041181		Exhibition Design B	Non-test	2	32	12	20	Spring semester 3
		School of Applied Art and Design	b2041018		Package Design	Non-test	3.5	56	20	36	Summer semester 3
	Sub-total						**8.5**	**136**	**40**	**96**	
	Sub-total (professional courses)						**49.5**	**792**	**296**	**496**	
Practical Training	Required	Engineering Training Center	b4090004		Basic engineering training D	Non-test	2	48		48	Summer semester 1
	Required	School of Applied Art and Design	b4040005		Material modeling C	Non-test	2	48	8	40	Autumn semester 2
	Required	School of Applied Art and Design	b4040008		Model making	Non-test	2	48	8	40	Spring semester 2
	Required	School of Applied Art and Design	b4041001		Professional cognitive internship	Non-test	2	48		48	Summer semester 2
	Required	School of Applied Art and Design	b4040014		Labor Education B	Non-test	0.5	16		16	Spring semester 3
	Required	School of Applied Art and Design	b4040013		Graduation Practice and Graduation Design (Thesis) for Industrial Design	Non-test	6	288		288	Spring semester 4
	Sub-total (Practical Training)						**14.5**	**496**	**16**	**480**	

Extracurricular Class	Required	Others	b5110001	Extracurricular Class	Non-test	1	-	-	-	Autumn, Spring, Summer
Total						**152**	**2816**	**1396**	**1420**	

12. Prerequisite for Course Study

No.	Course Name	Prerequisite Course	No.	Course Name	Prerequisite Course
1	Orchestration design A	Constitution of Design A	5	Product form design	Design Thinking and Expression
		Photography basics A			Model making
					Ergonomics
2	Model making	Design Graphics	6	Computer Aided Industrial Design 2	Design Graphics
		Basic engineering training D			Industrial Design Engineering Foundation
		Constitution of Design B			Material and molding process、
3	Ergonomics	Design method and principle	7	Product design Ⅱ	Design method and principle
		Model making			Market research and marketing strategy
					Industrial Design Engineering Foundation
					Ergonomics
4	Product design Ⅰ	Design method and principle	8	Product design Ⅲ	Design method and principle
		Ergonomics			Market research and marketing strategy
		Interactive Design			Industrial Design Engineering Foundation
		Orchestration design			Ergonomics

13. Extracurricular Class

Through taking extracurricular classes, students are encouraged to take part in academic lectures, social practice activities, campus cultural and sports activities, innovative and entrepreneurial activities, voluntary activities, etc. to improve their social adaptability and enhance the competitiveness in the job market. Details are specified in Students' Manual.