Instructive Cultivation Plan for the Program of Composites Manufacturing Engineering

(Grade 2020)

Course code: 080416T

1. Orientation

Based on the Yangtze River Delta and focusing on the whole country, the program will cultivate first-line engineering technical talents who are suitable for composite material molding process design, tooling design and related testing and testing, etc., capable of product development, application research, and operation management in aviation companies, machinery manufacturing companies, and composite materials processing companies.

2. Cultivation Objectives

1. General cultivation objective

This program cultivates application-oriented technical talents who can meet the needs of national economic development, adapt to the application needs of composite materials, have broad material and mechanical basic knowledge, solid composite material forming theory, methods and skills, have team spirit, innovative spirit and certain organizational management capabilities, and can be engaged in composite material product design, molding process control, related equipment development and manufacturing, and related management in materials processing field, especially in the field of aviation manufacturing.

2. Objective of value guidance

With the objective of cultivating engineering application talents that adapt to social development, taking aviation spirit as the value orientation and relying on school-enterprise cooperation and curriculum teaching as the carrier, this program will enhance students' independent learning ability, teamwork ability, innovation ability and social adaptability.

3. Objectives students must achieve five years after graduation:

- Be able to analyze, formulate and solve engineering problems related to professional positions, be able to independently solve more complex composite material molding technical problems, and adapt to an independent and team working environment;
- Familiar with the current status and development trend of the program at home and abroad; familiar with industry regulations and standards;
- Have a certain amount of practical experiences in engineering technology, have relevant work experience in intelligent manufacturing, be able to absorb advanced technology at home and abroad, and achieve certain results in improving research, design level and economic benefits.
- Be able to understand and solve engineering problems in composite material molding and related fields from the perspectives of social responsibility, legal and ethical training, safety and environmental awareness, sustainable development and economy.

3. Requirement for Graduation

In accordance with the 12 general standards for program certification and the actual situation of our school, the composite material molding program of our school expands the content of the core competence and quality expressions of the 12 graduation requirements. The index points of each graduation requirement are broken down as follows:

1. Engineering knowledge: be able to use mathematics, natural sciences, engineering foundations and professional knowledge to solve engineering problems in composite material molding.

1.1 Be able to apply the basic concepts of mathematics and natural science to the appropriate expression of complex engineering problems in composite material molding engineering;

1.2 Be able to establish a mathematical model for a complex system or process of composite material molding and be able to solve the model;

1.3 Be able to use relevant knowledge and mathematical models to derive and analyze complex engineering problems in composite material molding engineering;

1.4 Be able to analyze and compare solutions to complex engineering problems in composite material molding filed from the perspective of mathematics and natural science, and can try to improve.

2. Problem analysis: Be able to apply basic knowledge of mathematics, machinery, materials and aviation to identify, express, and analyze composite material molding engineering problems through literature research, so as to obtain effective conclusions.

2.1 Be able to apply the basic principles of mathematics, natural sciences and engineering sciences to identify and describe complex engineering problems in composite material molding field, and can analyze them through literature research to obtain effective conclusions;

2.2 Be able to apply the basic principles of mathematics, natural sciences and engineering sciences, to express complex engineering problems in composite material molding engineering filed, and can analyze them through literature research, so as to obtain effective conclusions;

2.3 Be able to apply the basic principles of mathematics, natural sciences and engineering sciences to analyze the complex engineering problems of composite material molding engineering through literature research, so as to obtain effective conclusions.

3. Develop solutions: be able to design molding process and process its molds for composite parts, and reflect the sense of innovation in the design while considering social, environmental, health, safety, legal, cultural and other factors.

3.1 Be able to determine the unit engineering design plan or process design plan according to user needs;

3.2 Be able to conduct research on the feasibility of the schemes involved through technical and economic evaluations under the constraints of society, health, safety, law, culture, and environment;

3.3 Be able to perform structural or unit process calculations and tooling design calculations through modeling;

3.4 Be able to integrate the overall process of the unit for process design, optimize process design schemes, and reflect the sense of innovation.

4. Research: Be able to research complex composite material molding problems based on

scientific principles and by using scientific methods, including material analysis and testing, designing experimental programs, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

4.1 Be able to apply basic knowledge of materials to conduct material analysis, testing and inspection, and obtain the law of influence of test parameters on material properties and their reasons.

4.2 Be able to apply professional technical knowledge and principles to carry out complex mechanism design or material development, and obtain the rationality of the mechanism or material through experiments or principle verification.

5. Use modern tools: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex material molding, processing, and tooling design issues, including prediction and simulation of complex composite material molding engineering problems, and be able to understand its limitations. 5.1 Be able to take advantage of information resources, literature search tools, modern engineering tools and information technology tools proficiently to understand the frontier development trends in the field of composite molding engineering;

5.2 Be able to use relevant modern engineering tools and information technology tools, such as computer technology, data analysis and graphics processing technology, to model, predict and simulate general engineering problems, and be able to understand its limitations.

6. Engineering and society: Based on the background knowledge related to composite material molding engineering, be able to conduct reasonable analysis, evaluate the impact of engineering problem solutions on society, health, safety, law and culture, and can understand the responsibilities to be born.

6.1 Master the national standards related to composite material molding engineering, as well as relevant machinery industry standards and aviation industry standards;

6.2 Be able to evaluate solutions to complex engineering problems based on professional knowledge and standards and from the aspects of social, health, safety, legal and cultural impact.

7. Environment and sustainable development: Be able to understand and evaluate the impact of engineering practice for complex molding technology of composite materials on the environment and sustainable development of society.

7.1 Understand the development of related industries, and be able to correctly understand the status and role of composite material molding technology in the entire industrial environment;

7.2 Master the evaluation methods of the impact of composite material molding engineering related technologies on the environment and sustainable social development, and be able to make reasonable evaluations.

8. Professional standards: Have humanities and social science literacy and a sense of social responsibility, be able to understand and abide by engineering professional ethics and standards in engineering practice, and perform the responsibilities.

8.1 Have a correct outlook on life and values, have a healthy physique and good qualities, and understand the individual's status in society and natural environment;

8.2 Be aware of the importance of physical and mental health to individual professional development, respect life, and have a humane accomplishment;

8.3 Familiar with the rules and systems related to the background of composite molding

engineering, understand and abide by professional ethics and regulations.

9. Individuals and teams: Be able to assume the roles of individuals, team members and leaders in a team under a multidisciplinary background.

9.1 When solving the complex engineering problems of composite material molding engineering, be able to actively share professional information with members of other disciplines, and can independently complete the work assigned by the team;

9.2 When solving complex engineering problems of composite material molding engineering, be competent for the roles and responsibilities of team members or leaders, and cooperate to complete the established tasks.

10. Communication: Be able to effectively communicate and exchange with industry colleagues and the public on composite material molding engineering issues, including writing reports and design manuscripts, making statements, expressing clearly or responding to instructions, and be able to communicate and exchange in a cross-cultural context.

10.1 Be able to accurately explain and express complex engineering issues in the field of material molding by writing reports and design manuscripts, presentations, clear expressions or responding to instructions, and can communicate effectively with industry colleagues and the public;

10.2 Master at least one foreign language, be able to read and understand professional foreign language literature and materials, and can communicate and exchange effectively with industry colleagues or the public.

11. Project management: understand and master engineering management methods, and be able to apply them in a multi-disciplinary environment.

11.1 Understand the important management content involved in the field of composite material molding engineering, and master relevant engineering management methods;

11.2 Be able to apply engineering management to the multidisciplinary environment of machinery, materials, and aviation.

12. Lifelong learning: have the consciousness of independent learning and lifelong learning, and have the ability to continuously learn and adapt to development.

12.1 Be able to combine problems, master the ways to acquire knowledge independently, and have the ability to continuously learn and adapt to the development of reading comprehension;

12.2 Be able to continuously learn and adjust based on social development to adapt to social development.

4. Schooling System

Four years

5. Length of Study

Flexible study period, generally four years, the minimum length of flexibility is not less than three years, the longest not more 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

Mechanical Engineering, Material Science and Engineering, Material Processing Engineering

8. Core Courses

1. Modern engineering drawing (96 course hours)

Through the study of this course, students will be able to master the basic theory of projection method, master the projection laws of spatial points, lines, surfaces and bodies, master the projection diagram expression methods of mechanical parts, be able to use common drawing tools and instruments to draw engineering draws correctly and skillfully, master the computer drawing ability of engineering drawings, master the general methods and specific steps of reading engineering drawings, and comprehensively improve the comprehensive quality of mechanical disciplines. This course will cultivate students' ability to draw engineering drawings, read engineering drawings, and initially conceive space shapes, thus laying a solid foundation for the realization of the Chinese aerospace dream.

2. Engineering Mechanics (96 course hours)

This course is divided into "Engineering Mechanics I" and "Engineering Mechanics II". Through the study of "Engineering Mechanics I", students will be able to select the isolator from the mechanism or structure and draw the free-body diagram accurately; be able to analyze the static force of the component and determine the binding force correctly; understand and solve the friction of the plane force system; correctly calculate the velocity and acceleration of a point, the angular velocity and angular acceleration of a rigid body; understand the relativity of motion, master the method of point motion and synthesis; correctly calculate the velocity and acceleration of each point on a rigid body in plane motion; use dynamics general theorems (theorem of momentum, theorem of moment of momentum, theorem of kinetic energy, theorem of mass center motion, differential equation of fixed axis rotation) to solve dynamic problems; use D'Alembert principle to solve dynamic reaction problems; understand the principle of virtual displacement. Through the study of "Engineering Mechanics II", students will obtain the preliminary ability to simplify general rod-like components into mechanical diagrams; be able to make the internal force diagrams of rods under basic deformation proficiently, calculate their stress and displacement, and carry out strength and stiffness calculations; understand the concept of stress state and strength theory, and apply it to the strength calculation of rods under combined deformation; understand the method of solving simple statically indeterminate problems; understand the concept of stability of compression rods, and be able to calculate the critical load and critical stress of axial compression rod, and check for stability; understand the concepts of dynamic load coefficient in dynamic load and fatigue failure and endurance limit in alternating stress; have a preliminary understanding of the basic mechanical properties and test methods of commonly used materials; have a preliminary understanding of the basic principles and methods of stress analysis in electrical measurement experiments. Engineers and technicians who are proficient in the knowledge structure of the basic courses of engineering mechanics will surely be able to play an important role in promoting China from a manufacturing country to a manufacturing power.

3. Mechanical principle and design (80 course hours)

This course mainly contains two parts, one part is the study of mechanical principles, enabling students to master and understand the working principles and design calculation methods of various mechanisms, master and understand the basic theories and basic knowledge of mechanism structure, mechanical kinematics and dynamics, and initially have the ability to determine the transmission system scheme and mechanism design, and cultivate and develop innovative

capabilities; this part mainly teaches the basic principles of mechanism composition, related theories and design calculation methods of various commonly used mechanisms (such as gear mechanisms, cam mechanisms, linkage mechanisms, gear trains, etc.). The second part is the mechanical design, which mainly introduces the general knowledge of mechanical design, the main types, performance, structural characteristics, applications, materials, standards, etc. of mechanical parts. Students are required to master the basic principles of mechanical design, the working principle of mechanical parts, stress analysis, stress state, failure mode, working capacity calculation criteria, etc. Through the study of this course, students will learn to design and calculate simple machines, be trained in design calculations, structural design and drawing, experiments, and technical documentation skills. The course learning is trained from the principles of mechanical design, the history of mechanical development, and the research and development of major national heavy equipment, and the socialist values and concepts is integrated into mechanical design through conceptual creativity and innovative design.

4. Electrician and Electronics (48 course hours)

This course will enable students to master the basics of electrical engineering and electronics necessary for the program. Through the study of this course, students will grasp the basic concepts and basic laws of circuits, be familiar with the basic analysis methods of DC and AC circuits; be familiar with the transition process of circuits, and obtain the ability to read and analyze relay contact control circuits; be familiar with the knowledge of factory power transmission and distribution and safe power use; master the application characteristics of common semiconductor components and the application of amplifying circuits and integrated operational amplifiers, be familiar with negative feedback circuits, and be familiar with gate circuits and combinational logic circuits, and trigger sequential logic circuits; be familiar with the basic experimental methods of electrical and electronic application technology. The study of this course is a necessary condition for students to become builders in the field of mechanical and electrical integration in the process of socialist modernization and to inherit the spirit of craftsmanship.

5. Comprehensive Chemistry (48 course hours)

As one of the important basic courses for this program, this course is a course with equal emphasis on theory and practice. The course content covers the basic knowledge of university chemistry, organic chemistry and physical chemistry, but also focuses on the knowledge of composite materials. This course introduces comprehensively the principles and methods of substance synthesis, substance structure and properties, chemical equilibrium, chemical reaction thermodynamics and kinetics, and basic knowledge of interface chemistry. Through the study of this course, students will understand the basic theories of chemistry, have the necessary basic knowledge and certain basic skills, and lay the necessary foundation for learning related follow-up courses and further mastering new scientific and technological achievements. The combination of theory and practice is the prominent embodiment of socialist values in the course study. Through a firm grasp of basic knowledge, the dream of aerospace will be realized.

6. Basic materials science (32 course hours)

Basic materials science is a professional basic course for students majoring in composite materials. Combining metals and alloys, ceramics, polymers, composite materials and other materials, this course focuses on describing the basic theories and applications of materials science, including crystallography, crystal defects, solid material structure and bonding theory, solid dynamics (diffusion) and other contents. Through the study and mastery of the basics of material science, this course is helpful for students to select materials reasonably and adapt to local conditions in the future modernization construction, thereby promoting the realization of the dream of aerospace.

7. Fundamental of mechanical manufacture (48 course hours)

This course teaches the basic knowledge in mechanical manufacturing, including the mechanical properties of commonly used metal materials, selection of metal materials and main heat treatment

methods; basic knowledge of metal blank casting, forging, and welding forming methods; basic knowledge of cutting principles; based knowledge required for various cutting and machining methods of commonly used parts, and the machine tools, technology and other aspects required for the cutting process. The study of this course can promote the development of our country from a large manufacturing country to a strong manufacturing power, and promote the process of socialist construction under the guidance of the spirit of craftsmen and model workers.

8. Composite material molding mold design and course design (72 course hours)

This course mainly teaches composite material forming process, process specification formulation and dimension chain, work-piece positioning, reference and clamping knowledge and methods, typical composite material mold structure classification and characteristics, composite material mold design ideas and methods, etc. This course will cultivate students' ability to analyze the mold structure, the ability to design a reasonable mold, the ability to engage in mold manufacturing process technology and organize mold production management. A good foundation determines the superstructure. The design of the mold is very important to the processing and manufacturing of the product. The formation of a complete knowledge system is a microcosm of socialist modernization. It takes the storage and utilization of thousands of knowledge to realize the take-off of the motherland.

9. Polymer matrix composite material and its molding process (64 course hours)

This course mainly contains two parts: one part introduces the basic concepts, basic principles and basic properties of polymer matrix composites, including the concept, characteristics, application and progress of composite materials. Through this part, students will understand the preparation methods and performance characteristics of different polymer matrix composites, and understand the application of polymer matrix composites. The other part mainly introduces the main molding technology of composite materials, including autoclave molding, injection molding process and application, compression molding process and application, winding molding process and application and other technologies. This part enables students to master various molding processes and obtain the ability to prepare composite materials. Students will carry out in-depth and specific learning on composite materials, as the main research object of this program. This is conducive to the integrity of the students' knowledge structure, and provides them with a solid theoretical foundation for working and serving the society in the future, thus providing sufficient reserve force for rise of the nation.

9. Practical Training

The main practice links are composed of basic practice links, off-campus practice, basic experiments on composite materials, special experiments on composite materials, design and synthesis. The basic practice links include college physics experiments and basic engineering training C required for engineering students. The basic experiments of composite materials involve composite material preparation and performance testing. The processing and molding practice links include interchangeability and measurement technology practice, computer-aided design, mold numerical control processing and curriculum design, composite material molding design and curriculum design, etc. Through the complementation of the basic experiments of composite materials and the practice links of processing and molding, students will have a deeper grasp and understanding of the performance, characterization, processing and molding of composite materials. Through different stages of corporate internships, such as cognition internship, corporate practice, 5-week comprehensive practice, and 8-week production internship, etc., students will be familiar with the production, processing and molding of composite materials, and the process of component assembly. In the senior grades, through the training of innovation and entrepreneurship courses, graduation design and graduation internships, students will obtain comprehensive design and application development capabilities, strengthen teamwork and innovation idea, and have the ability to adapt to social development.

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

Category	Total Credit	%	Total Course Hours	Theory Learning	Practical Training
General Education	48.5	32	928	864	64
Basic Course	33	22	528	488	40
Professional Course	24	16	384	332	52
Practical Training	35	23	1144	0	1144
General Course	10	7	160	160	0
Total	151	100	3144	1844	1300
Theory : Practice(%)	59:41				

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	spring 1
	required	School of Marxism	b1080003	Ideological and moral cultivation and legal foundation	non-test	3	48	42	6	spring 1
	required	School of Marxism	b1080006	Outline of Chinese Modern History	non-test	3	48	42	6	autumn 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 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 2
	required	School of Marxism	-----	Situation and Policy (module 1～4)	non-test	2	32	28	4	autumn 1～ spring 2
	required	School of Marxism	b1080008	Labor Education A	non-test	0.5	16	16		autumn 2
	required	College of Arts and Sciences	b1020080	Advanced Mathematics A1	test	4	64	64		autumn 1
	required	College of Arts and Sciences	b1020081	Advanced Mathematics A2	test	4	64	64		spring 1
	required	College of Arts and Sciences	b1020012	Linear algebra	test	2	32	32		autumn 2
	required	College of Arts and Sciences	b1020018	College Chinese	non-test	2	32	32		spring 1
	required	College of Arts and Sciences	b1020062	College Physics A(module 1)	test	3	48	48		spring 1
	required	College of Arts and Sciences	b1020065	College Physics B	test	2	32	32		autumn 2
	required	College of Arts	b1020066	College Physics C	non-test	1	32		32	spring 1

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
		and Sciences								
	required	Department of Physical Education	-----	Physical Education I～VI	non-test	3	160	160		autumn 1～ autumn 4
	required	Others	b1110003	Military skills	non-test	0.5	2W			autumn 1
	required	College of Arts and Sciences	b1110002	Military theory	non-test	0.5	32	32		autumn 2
	★English (selective, 1 module, 10 credits)	Module A	b1020003	General English III	test	3	48	48		autumn 1
			b1020004	General English IV	test	3	48	48		spring 1
			b1020005	General Academic English A	test	2	32	32		autumn 2
			---	English development	non-test	2	32	32		spring 2
		Module B	b1020002	General English II	test	3	48	48		autumn 1
			b1020003	General English III	test	3	48	48		spring 1
			b1020006	General Academic English B	test	2	32	32		autumn 2
			---	English development	non-test	2	32	32		spring 2
		Module C	b1020001	General English I	test	4	64	64		autumn 1
			b1020002	General English II	test	3	48	48		spring 1
			b1020003	General English III	test	3	48	48		autumn 2
	★German	College of Arts and Sciences	b1020040	German I	test	3	48	48		autumn 1
		College of Arts and Sciences	b1020041	German II	test	3	48	48		spring 1
		College of Arts and Sciences	b1020042	German III	test	4	64	64		autumn 2
	★Japanese	College of Arts and Sciences	b1020077	Japanese I	test	3	48	48		autumn 1
		College of Arts and Sciences	b1020078	Japanese II	test	3	48	48		spring 1
		College of Arts and Sciences	b1020079	Japanese III	test	4	64	64		autumn 2
Total (General Education)						**48.5**	**928**	**864**	**64**	

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
General Course	required	College of Engineering	b2011470	Scientific paper writing and document retrieval	non-test	2	32	32		autumn 1
	selective	Others	b0-----	Social Science and Humanities (4 credits) Natural Science and Technological Innovation (2 credits) Public Art (2 credits)	non-test	8	128	128		Autumn, spring
Subtotal (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	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
Basic professional courses	required	College of Engineering	b2011317	Introduction to Composite Material Molding Engineering	non-test	1	16	16		autumn 1
	required	College of Engineering	b2011137	Modern Engineering Drawing I	test	3	48	48		autumn 1
	required	College of Engineering	b2011318	Comprehensive Chemistry	test	3	48	48		autumn 1
	required	College of Engineering	b2011319	Introduction to Aerospace	non-test	2	32	32		autumn 1
	required	College of Engineering	b2011138	Modern Engineering Drawing II	non-test	3	48	32	16	spring 1
	required	College of Engineering	b2011388	Polymer physics	test	2	32	32		spring 1
	required	College of Engineering	b2011389	Fundamentals of Materials Science (English teaching)	non-test	2	32	32		autumn 2
	required	work training	b2090001	Electrician and Electronics	test	3	48	42	6	spring 2
	required	College of Engineering	b2011350	Mechanical principle and design	test	5	80	72	8	spring 2
	required	College of Engineering	b2011049	Engineering Mechanics Ⅰ	test	3	48	48		autumn 2
	required	College of Engineering	b2011050	Engineering Mechanics Ⅱ	test	3	48	44	4	spring 2
	required	College of Engineering	b2011080	Machinery Manufacturing Foundation	test	3	48	42	6	autumn 2
Subtotal (Basic professional courses)						**33**	**528**	**488**	**40**	
Professional courses	required	College of Engineering	b2011351	Composite interface and performance	test	2	32	32		autumn 2
	required	College of Engineering	b2011359	Polymer-based composite material and its molding process	test	4	64	64		autumn 3
	required	College of	b2011152	Hydraulic and Pneumatic Transmission	test	2	32	28	4	spring 2

		Engineering								
	required	College of Engineering	b2011353	Material analysis and testing	non-test	2	32	16	16	autumn 3
	required	College of Engineering	b2011354	Corporate culture and quality management	non-test	1	16	16		spring 3
	required	College of Engineering	b2011357	Advanced connection technology	non-test	2	32	32		autumn 3
	required	College of Engineering	b2011358	Non-destructive testing technology for aviation materials and parts	non-test	1	16	10	6	autumn 4
	required	College of Engineering	b2011360	Collaborative manufacturing	non-test	2	32	32		autumn 4
	Subtotal (required professional courses)					**16**	**256**	**230**	**26**	
	★Module selective 8 credits	Module A	b2011361	Aircraft Construction	non-test	2	32	28	4	autumn 3
			b2011362	Advanced resin-based composite material automated manufacturing technology	test	3	48	40	8	autumn 3
			b2011363	Aircraft Assembly Technology	test	3	48	42	6	spring 3
		Module B	b2011364	Polymer material molding process	test	3	48	44	4	autumn 3
			b2011365	Technology of Mechanical Manufacture	test	3	48	40	8	autumn 3
			b2011366	Composite material processing technology	non-test	2	32	24	8	spring 3
		Module C	b2011127	Special processing technology	non-test	2	32	26	6	spring 3
			b2011365	Technology of Mechanical Manufacture	test	3	48	40	8	autumn 3
			b2011367	Polymer Material Mould CAD	test	3	48	36	12	autumn 3
	Subtotal (modular professional courses)					**8**	**128**	**102**	**26**	
Subtotal (professional courses)						**24**	**384**	**332**	**52**	

11. Teaching schedule (3)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hour	Theory Learning	Practical Training	Semester
Vocational practice	required	College of Engineering	b4000023	Innovation and entrepreneurship of composite material molding engineering	non-test	2	48		48	spring 3
	required	work training	b4090003	Basic engineering training C	non-test	2	48		48	spring 1
	required	College of Engineering	b4011043	Interchangeability and measurement technology practice	non-test	2	48		48	summer 1
	required	College of Engineering	b4011222	Cognition practice	non-test	1	24		24	summer 1
	required	College of Engineering	b4011228	Material mechanical performance test	non-test	1	24		24	summer 2
	required	College of Engineering	b4011223	Computer Aided Design (CATIA)	non-test	2	48		48	summer 1
	required	College of Engineering	b4011286	Business practice	non-test	2	48		48	summer 2
	required	College of Engineering	b4011225	Course exercise of mechanical principle and design	non-test	2	48		48	summer 2
	required	College of Engineering	b4011226	Composite material preparation and performance test	non-test	2	48		48	autumn 3
	required	College of Engineering	b4011227	Composite material mould design and course design	non-test	3	72		72	spring 3
	required	College of Engineering	b4011152	Mould CNC machining (CAM)	non-test	3	72		72	spring 3
	required	College of Engineering	b4011287	Production Practice	non-test	4	192		192	autumn 4
	required	College of Engineering	b4011229	Comprehensive Practice	non-test	3	120		120	summer 3
	required	College of Engineering	b4011339	Labor Education B	non-test	0.5	16		16	spring 3
	required	College of Engineering	b4011230	Graduation Practice and Graduation Design (Thesis) of Composite Material Molding	non-test	6	288		288	spring 4

				Engineering						
Subtotal (professional practice)						**35.5**	**1144**		**1144**	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	non-test	1	-	-	-	Autumn, spring, summer
Total						**152**	**3144**	**1844**	**1300**	

★ 1. Guidance for professional module courses:

Professional courses are divided into modules according to different ability requirements. Students must select one of the modules and obtain the required credits for that module.

1. Module A: Aircraft manufacturing and assembly
2. Module B: Composite material processing
3. Module C: Mold manufacturing

2. Professional Certificates can be gained after learning following courses:

Students who have passed the Computer Aided Design (CATIA) course can participate in the professional qualification certificate assessment related to the program: CATIA intermediate certificate; CATIA advanced certificate.

Students who have obtained the CATIA Intermediate Certificate and above can apply for exemption from Computer Aided Design (CATIA) course and obtain corresponding credits.

12. Prerequisite for Course Study

No.	Course name	Prerequisite Course	No.	Course name	Prerequisite Course
1	Interchangeability and measurement technology practice	Modern Engineering Drawing	7	Aircraft Assembly Technology	Introduction to Aerospace
		Basic engineering training C			Aircraft Construction
					Advanced connection technology
2	Composite interface and performance	College Physics	8	Composite material processing technology	Technology of Mechanical Manufacture
		Fundamentals of material science			Polymer-based composite material and its molding process
		Comprehensive Chemistry			Composite material preparation and performance test
3	Machinery Manufacturing Foundation	Modern Engineering Drawing	9	Course exercise of mould CNC machining (CAM)	Technology of Mechanical Manufacture
		Basic engineering training C			Computer Aided Design (CATIA)
		Interchangeability and measurement technology practice			Composite material mould design and course design
4	Mechanical principle and design	Calculus	10	Collaborative manufacturing	Non-destructive testing technology for aviation materials and parts
		Linear algebra			Advanced connection technology
		Engineering Mechanics			Hydraulic and Pneumatic Transmission
		Machinery Manufacturing Foundation			Polymer-based composite material and its molding process

5	Polymer-based composite material and its molding process	Comprehensive Chemistry	11	Advanced resin-based composite material automated manufacturing technology	Composite interface and performance
		Fundamentals of material science			Introduction to Aerospace
		Composite interface and performance			
		Mechanical principle and design	12	Technology of Mechanical Manufacture	Basic engineering training C
		Machinery Manufacturing Foundation			Machinery Manufacturing Foundation
6	Composite material mould design and course design	Polymer-based composite material and its molding process			
		Computer Aided Design (CATIA)			
		Mechanical principle and design			
		Interchangeability and measurement technology practice			

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.