Intelligent Manufacturing Engineering

(Grade 2023)

Course code: 080213T

I. Cultivation Objectives

1. General cultivation objective

The program strives to cultivate high quality interdisciplinary engineering talents with comprehensive development of morality, intellect, physique, aesthetics and labour, who have solid basic knowledge of natural science theories and good humanities, master the professional knowledge of mechanical design, electrical control, computer and information management technology and other disciplines, and have strong engineering practical ability to engage in the design, manufacture and integration of intelligent mechatronics systems in the field of intelligent manufacturing engineering, as well as operation and management, intelligent equipment installation, application and maintenance in intelligent factories.

2. Objective of value guidance

The program is led by the overall goal of the "Made in China 2025" development plan for a strong manufacturing China, and takes the spirit of model workers and craftsmanship as its value orientation. In the process of education and teaching, the values of engineers and engineering ethics will be taught through the spirit of craftsmanship, and students will develop a rigorous, meticulous and dedicated working attitude, the concept of fine craftsmanship and perfection, and the mastery of excellent skills and techniques. Students will be trained to have a good knowledge of intelligent manufacturing engineering and a sense of mission to join the construction of a strong manufacturing China, and to aspire to achieve the development goals of a strong manufacturing China and the Chinese dream of the great rejuvenation of the Chinese nation.

3. Five years after graduation, students in this program should achieve the following objectives:

(1) Have good engineering practice ability and innovation spirit, and be able to analyse and solve complex engineering problems related to professional positions by making comprehensive use of interdisciplinary knowledge in fields related to intelligent manufacturing engineering.

(2) Have a well developed personality and good scientific and cultural qualities, be able to work in strict compliance with professional codes, have moral qualities and a sense of social responsibility, have a sense of safety and environmental protection, and be able to actively serve the country and society in their field of work.

(3) Have strong teamwork spirit, be able to communicate effectively with colleagues, peers and clients, can adapt to team work and carry out project activities as a team member or leader.

(4) Be able to continuously improve their qualities and abilities through independent learning and adapt to the needs of their career development.

II. Requirement for Graduation

According to the 12 general standards of engineering certification, combined with the positioning of intelligent manufacturing engineering program, the core competencies and quality expressions of the 12 graduation requirements are expanded, and the indicators of each graduation requirement are listed as follows:

1. Engineering knowledge: Be able to apply mathematical, natural science and engineering fundamentals and professional knowledge to the solution of complex engineering problems in Intelligent Manufacturing Engineering and related fields.

1-1: Be able to master the mathematical, natural science, engineering fundamentals and professional knowledge

necessary for the intelligent manufacturing engineering and to use them in the rational formulation of complex engineering and technical problems in intelligent manufacturing.

1-2: Be able to develop mathematical models and solve them for specific intelligent manufacturing systems or production process objects.

1-3: Master the fundamentals of mechanical drawing, mechanical design, mechanical manufacturing, PLC, principles of engineering control and other professional knowledge, and can used them to calculate, verify and analyze the design solutions for complex engineering problems in intelligent manufacturing.

1-4: Be able to comprehensively apply professional knowledge of intelligent manufacturing engineering to compare and improve solutions of complex engineering problems in intelligent manufacturing.

2. Analysis of the Problem: Be able to apply the fundamental principles of mathematics, natural and engineering sciences to identify, describe, and through literature research to analyse complex engineering problems in intelligent manufacturing and related fields in order to reach valid conclusions.

2-1: Be able to apply fundamental knowledge and fundamental principles of mathematics, natural and engineering sciences to identify and determine key technologies and critical parameters of complex engineering problems in intelligent manufacturing.

2-2: Be able to realize the diversity of solutions to complex engineering problems in intelligent manufacturing and to seek effective solutions through literature research and analysis.

2-3: Be able to master professionally relevant technical methods and modelling methods to express complex engineering problems using drawings, diagrams, text and mathematical models, etc.

2-4: Be able to apply knowledge and principles of intelligent manufacturing engineering and application areas to analyse impact factors and reach valid conclusions with the help of literature research.

3. Design/develop of solutions: For complex engineering problems in the field of intelligent manufacturing engineering, be able to design solutions and systems, control engineering, components or equipment to meet specific needs, and demonstrate the spirit of innovation in the design process, taking into account social, health, safety, legal, cultural and environmental factors.

3-1: Master basic design/development methods and techniques for the full life cycle and full process of designing mechatronics systems and developing products of intelligent equipment in the field of intelligent manufacturing engineering, be able to propose design objectives and analyse the factors affecting design objectives and technical solutions.

3-2: Be able to design mechatronics integrated systems, units (components) or processes that meet the specific needs of complex engineering problems in intelligent manufacturing.

3-3: Be able to integrate social, health, safety, legal, ethical, cultural and environmental considerations into the design and propose reasonable technical solutions for design, development, operation and management, and demonstrate a sense of innovation.

3-4: Be able to present design results in the form of design reports, engineering drawings or physical objects.

4. Research: Be able to conduct research on complex engineering problems in the field of intelligent manufacturing engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and synthesizing information to reach reasonable and valid conclusions.

4-1: Be able to select routes of research, design a practical experimental plan and conduct experimental research based on basic professional knowledge and the characteristics of complex engineering problems in intelligent

manufacturing.

4-2: Be able to construct experimental systems based on experimental protocols, conduct experiments safely and collect experimental data correctly.

4-3: Master the methods of data collection and analysis, be able to process and interpret experimental data, reach reasonable and valid research conclusions through information synthesis, and have the ability to optimise design.

5. Use of modern tools: Be able to develop, select and use appropriate techniques, resources, modern engineering tools and information technology tools for complex engineering problems in the field of intelligent manufacturing engineering, including prediction and simulation of complex engineering problems, and be able to understand their limitations.

5-1: Be able to understand the working principles and methods of commonly used modern instrumentation, IT tools, engineering tools and simulation software for complex engineering problems in intelligent manufacturing.

5-2: Be able to develop, select and use appropriate techniques and modern engineering tools to simulate and predict professional problems for complex engineering problems in intelligent manufacturing engineering, and be able to understand their limitations.

5-3: Master the sources and methods of accessing to important literature in the field of intelligent manufacturing engineering.

6. Engineering and Society: Be able to perform reasonable analysis based on intelligent manufacturing engineering-related contextual knowledge and evaluate how the solutions to complex engineering problems in intelligent manufacturing engineering may impact society, health, safety, law, and culture, and understand the responsibilities involved.

6-1: Have experience in engineering practice and internship, be acquainted with professional related background knowledge, master the technical standards, intellectual property rights, industrial policies and laws and regulations of the intelligent manufacturing engineering industry, and understand the potential impact of different social cultures on intelligent manufacturing engineering activities.

6-2: Be able to analyze and evaluate the impacts of engineering practices and problem solutions for intelligent manufacturing on society, health, safety, law, culture and the impacts of these constraints on project implementation, and understand the responsibilities involved.

6-3: Understand properly the social, safety and legal responsibilities expected of intelligent manufacturing engineers and technicians in engineering practice.

7. Environment and Sustainable Development: Be able to understand and evaluate the environmental and social sustainability impacts of engineering practices specific to the field of intelligent manufacturing.

7-1: Understand the national sustainable development strategy and related policies and laws and regulations, be able to understand the meaning and significance of environmental protection and sustainable development in engineering practice, and be able to carry out the concept of environmental protection and sustainable development when solving complex engineering problems.

7-2: Be able to evaluate whether engineering practice activities such as the design and application of actual intelligent manufacturing systems can reflect environmentally friendly features such as clean production and green manufacturing, as well as their impact on the sustainable development of society.

8. Professional Codes: Have humanistic, social and scientific qualities, social responsibility, and the ability to understand and comply with engineering ethics and codes in the practice of mechanical engineering and fulfill the

responsibilities.

8-1: Have proper world perspective, philosophy and values, good humanistic, social and scientific qualities and a sense of social responsibility, an understanding of the relationship between the individual and society, and an understanding of China's national situation

8-2: Be physically healthy and mentally fit, understand the social responsibility of intelligent manufacturing engineers and technicians for the safety, health and well-being of the public and for environmental protection, have a proper understanding of one's place in society and the natural environment, and fulfil their responsibilities consciously.

8-3: Understand the engineering ethics and codes of honesty, integrity and loyalty and be able to consciously observe them in their engineering practice activities.

9. Individual and team: Be able to assume the role of individual, team member and leader of multidisciplinary team.

9-1: Have teamwork spirit and awareness, good interpersonal skills and strong adaptability, be able to communicate effectively with members of other disciplines, make suggestions, promote the implementation of team plans, and work independently and cooperatively.

9-2: Be able to organize, coordinate and direct the work of a team in a multidisciplinary context and make proper decisions.

10. Communication: Be able to communicate and interact effectively with industry peers and the public on complex mechatronics engineering issues, including writing reports and design submissions, presenting statements, clearly expressing or responding to instructions, and having an international perspective and the ability to communicate and interact in a cross-cultural context.

10-1: Be able to communicate and interact effectively with others on complex engineering issues in intelligent manufacturing, including writing reports and briefs design, presenting statements, expressing views accurately, responding to challenges, and understanding the differences between communication with peers and the public.

10-2: Have an international perspective, be able to read and understand scientific and technical literature in foreign languages, be aware of international trends in their field of specialization, and be able to use foreign languages proficiently to communicate and interact in a basic intercultural context on professional engineering issues.

11. Project Management: Understand and master the principles of engineering management and economic decision-making methods and be able to apply them in a multidisciplinary environment.

11-1: Understand engineering management and economic decision-making issues in intelligent manufacturing systems and have knowledge of engineering management and economic decision-making methods.

11-2: Be able to apply engineering management and economic decision-making methods in the design and development of intelligent manufacturing project solutions in a multidisciplinary environment.

12. Spirit and ability of lifelong learning: Have the spirit of independent and lifelong learning and the ability to learn and adapt to development constantly.

12-1: Understand the diversity of technologies and environments, the demands of technological progress and social development on knowledge and competencies, and be able to understand the necessity of continuous exploration and learning.

12-2: Be able to understand, summarize and generalize complex engineering and technical problems in intelligent manufacturing, to adapt to the needs of technological progress and social development, and to persist in continuous

learning and improvement in engineering practice.

III. Schooling System

Four years.

IV. 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.

V. 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 166 credits for graduation; those who meet the requirements for bachelor's degree can be conferred bachelor degree in Intelligent Manufacturing Engineering.

VI. Discipline

Mechanical Engineering, Control Science and Engineering, Computer Science and Technology

VII. Core Courses

Modern Engineering Drawing, Engineering Mechanics, Electrical and Electronic Engineering, Fundamentals of Mechanical Design, Fundamentals of Machinery Manufacturing, Embedded System Design, Programmable Controller (PLC), CNC Machine Tools and Programming, Artificial Intelligence Technology and Application, Cyber Physical Systems (CPS), Industrial Robotics, Sensor and Intelligent Detection Technology, Intelligent Manufacturing Production Management (MES/ERP), Practice for Computer Aided Design and Manufacturing, Practice for PLC technology application, Practice for Smart Factory Production, Comprehensive Practice for Intelligent Manufacturing, etc.

VIII. Course Structure and Course Hours (excluding Extracurricular Class)

Course Type	Total Credits	%	Total Course	Theory Learning	Practical Training
Public Fundamental Course	60.5	37	1104	1018	86
General Education	10	6	160	160	0
Engineering Fundamental Course	20	12	320	278	42
Professional Fundamental Course	14	8	224	196	28
Professional Course	27	16	432	362	70
Professional Practice	33.5	20	976	0	976
Total	165	100	3216	2014	1202
Theory: Practical (%)	62:38				

IX. Teaching schedule (1)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Public Fundamental Course	required	School of Marxism	b1080006	Outline of Modern Chinese History	non-test	3	48	42	6	Autumn 1
	required	Others	b1110004	Mental Health Education for University Students	non-test	2	32	16	16	Autumn 1
	required	School of Marxism	b1080001	Basic Principles of Marxism	test	3	48	42	6	Spring 1
	required	School of Marxism	b1080009	Ethics and the Rule of Law	non-test	3	48	42	6	Spring 1
	required	School of Marxism	b1080010	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	test	3	48	42	6	Spring 2
	required	School of Marxism	b1080011	Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	test	3	48	42	6	Autumn 2
	required	School of Marxism	-----	Situation and Policy (Modules 1 to 4)	non-test	2	32	28	4	Autumn 1 to Spring 2
	required	School of Marxism	b1080008	Labour Education A	non-test	0.5	16	16		Autumn 2
	required	School of Mathematics, Physics and Statistics	b1020080+	Advanced Mathematics A1	test	4	64	64		Autumn 1
	required	School of Mathematics, Physics and Statistics	b1020081+	Advanced Mathematics A2	test	4	64	64		Spring 1
	required	School of Mathematics, Physics and Statistics	b1020012	Linear Algebra	test	2	32	32		Spring 2
	required	School of Mathematics, Physics and Statistics	b1020013	Probability Theory and Mathematical Statistics	test	2	32	32		Autumn 2
	required	School of Mathematics, Physics and Statistics	b1020023	Functions of complex variables and integral transformations	non-test	2	32	32		Spring 2
	required	School of Mathematics, Physics and Statistics	b1020076	Calculation method	test	2	32	32		Spring 2
	required	School of Mathematics, Physics and Statistics	b1020062	Academic Physics A (Module 1)	test	3	48	48		Spring 1
	required	School of Mathematics, Physics and Statistics	b1020065	Academic Physics B	test	2	32	32		Autumn 2
	required	School of Mathematics, Physics and Statistics	b1020111	Academic Physics C	non-test	2	32		32	Spring 1
	required	College of Resources and Environment	b1013001	Academic Chemistry	test	2	32	28	4	Autumn 1
	required	School of Foreign Language and Cultural Communication	b1020018	Academic Chinese	non-test	2	32	32		Spring 1
	required	Others	b1110003	Military skills	non-test	0.5	2W			Autumn 1
	required	Others	b1110002	Military theory	non-test	0.5	32	32		Autumn 2
	required	College of Physical Education	-----	Physical Education I to VI	non-test	3	160	160		Autumn 1 to Autumn 4
	★ College English (10 Credits for 1	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 Knowledge Expansion	non-test	2	32	32		Spring 2
		Module B	b1020002	General English II	test	33	48	48		Autumn 1

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
	Module)		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
	★ College German	School of Foreign Language and Cultural Communication	b1020040	College German I	test	3	48	48		Autumn 1
		School of Foreign Language and Cultural Communication	b1020041	College German II	test	3	48	48		Spring 1
		School of Foreign Language and Cultural Communication	b1020042	College German III	test	4	64	64		Autumn 2
	★ College Japanese	School of Foreign Language and Cultural Communication	b1020077	College Japanese I	test	3	48	48		Autumn 1
		School of Foreign Language and Cultural Communication	b1020078	College Japanese II	test	3	48	48		Spring 1
		School of Foreign Language and Cultural Communication	b1020079	College Japanese III	test	4	64	64		Autumn 2
Subtotal			**Subtotal**	**(Public Fundamental Course)**		**60.5**	**1104**	**1018**	**86**	
General Education	selective	Art Education Center	b0------	Aesthetic Education	test	2	32	32		Autumn, Spring
	selective	Each Colleges	b0------	Social Sciences and Humanistic Qualities	test	4	64	64		Autumn, Spring
				Natural Sciences and Technology Innovation	test	4	64	64		Autumn, Spring
Subtotal			**Subtotal**	**(General Education)**		**10**	**160**	**160**		

★Note: The total number of credits for the first foreign language is 10, including 3 languages, namely College English, College German, and College Japanese, and the language should be selected as needed; among them, when choosing College English, the appropriate module should be selected in Module A, B and C.

IX. Teaching schedule (2)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Engineering Fundamental Course	required	School of Intelligent Manufacturing and Control Engineering	b2011137	Modern Engineering Drawing I	non-test	3	48	40	8	Autumn 1
	required	School of Intelligent Manufacturing and Control Engineering	b2011138	Modern Engineering Drawing II	test	3	48	32	16	Spring 1
	required	School of Intelligent Manufacturing and Control Engineering	b2011397	Fundamentals of Engineering Materials	non-test	2	32	28	4	Spring 1
	required	School of Intelligent Manufacturing and Control Engineering	b2011049	Engineering Mechanics I	non-test	3	48	48		Autumn 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011050	Engineering Mechanics II	non-test	3	48	44	4	Spring 2
	required	Engineering Training	b2090001	Electrical and Electronic Engineering	non-test	3	48	42	6	Spring 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011521	Fundamentals of Thermal Engineering and Fluid	non-test	3	48	44	4	Autumn 3
Subtotal (Engineering Fundamental Course)						**20**	**320**	**278**	**42**	
Professional	required	School of Intelligent Manufacturing and Control Engineering	b2011394	Introduction to Intelligent Manufacturing Engineering	test	1	16	14	2	Autumn 1

Fundamental Course	required	School of Intelligent Manufacturing and Control Engineering	b2011315	Fundamentals of Programming	non-test	2	32	26	6	Spring 1
	required	School of Intelligent Manufacturing and Control Engineering	b2011345	Fundamentals of mechanical design	non-test	4	64	60	4	Spring 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011531	Modern control engineering	non-test	2	32	28	4	Spring 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011080	Fundamentals of machine building	non-test	3	48	42	6	Autumn 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011143	Project Management	test	2	32	26	6	Autumn 3
Subtotal (Professional Fundamental Course)						**14**	**224**	**196**	**28**	
Professional Course	required	School of Intelligent Manufacturing and Control Engineering	b2011520	Scientific and Technical Paper Writing and Literature	test	1	16	16	0	Autumn 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011530	Python Programming	non-test	2	32	28	4	Autumn 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011428	Embedded System Design	test	2	32	26	6	Spring 2
	required	School of Intelligent Manufacturing and Control Engineering	b2011182	Programmable Controllers (PLC)	test	2	32	24	8	Autumn 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011119	CNC machines and programming	non-test	2	32	26	6	Autumn 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011522	Artificial intelligence technologies and applications	test	2	32	26	6	Autumn 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011446	Industrial robotics	test	2	32	28	4	Autumn 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011152	Hydraulic and Pneumatic Transmission	non-test	2	32	28	4	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011331	Machine Vision Technology and Applications	test	2	32	26	6	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011329	Sensors and intelligent detection technology	non-test	2	32	26	6	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b2011433	Intelligent Manufacturing Production Management	non-test	2	32	24	8	Spring 3
	Subtotal (Required Professional Course)					**21**	**336**	**278**	**58**	
	Selective 6 credits	School of Intelligent Manufacturing and Control Engineering	b2011340	Cyber Physical System (CPS)	test	2	32	28	4	Autumn 3
		School of Intelligent Manufacturing and Control Engineering	b2011431	Intelligent Mechatronics Transmission Control	test	2	32	28	4	Autumn 3
		School of Intelligent Manufacturing and Control Engineering	b2011504	Industrial Internet Technologies and Applications	test	2	32	28	4	Autumn 3
		School of Intelligent Manufacturing and Control Engineering	b2011435	Predictive maintenance of mechatronics equipment	test	2	32	28	4	Spring 3
		School of Intelligent Manufacturing and Control Engineering	b2011434	Intelligent equipment fault diagnosis and maintenance	test	2	32	28	4	Spring 3
		School of Intelligent Manufacturing and Control Engineering	b2011436	Big Data and Deep Learning	test	2	32	28	4	Spring 3
	Subtotal (Selective Professional Course)					**6**	**96**	**84**	**12**	
Subtotal (Professional Course)						**27**	**432**	**362**	**70**	

IX. Teaching schedule (3)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Professional Practice	required	Engineering Training	b4090001	Basic Engineering Training A	test	3	72		72	Summer 1
	required	School of Intelligent Manufacturing and Control Engineering	b4011299	Practice for Engineering Drawing/Surveying and Interchangeability	test	2	48		48	Summer 1
	required	School of Intelligent Manufacturing and Control Engineering	b4011362	Project Training for Intelligent Assembly	test	2	48		48	Summer 2
	required	School of Intelligent Manufacturing and Control Engineering	b4011363	Practice for Electrical and Electronic Engineering Skills	test	1	24		24	Summer 2
	required	School of Intelligent Manufacturing and Control Engineering	b4011310	Practice for Embedded Systems Application	test	1	24		24	Summer 2
	required	School of Intelligent Manufacturing and Control Engineering	b4011059	Practice for Computer Aided Design and Manufacturing	test	3	72		72	Autumn 3

	required	School of Intelligent Manufacturing and Control Engineering	b4011302	Course Design for Mechanical Design(E)	test	2	48		48	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b4011339	Labour Education B	test	0.5	16		16	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b4000022	Innovation and Entrepreneurship in Intelligent Manufacturing Engineering	test	2	48		48	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b4011358	Industrial robot system integration	test	2	48		48	Spring 3
	required	School of Intelligent Manufacturing and Control Engineering	b4011082	CNC Machining Practice	test	1	24		24	Summer 3
	required	School of Intelligent Manufacturing and Control Engineering	b4011364	Practice for PLC technology	test	2	48		48	Summer 3
	required	School of Intelligent Manufacturing and Control Engineering	b4011365	Practice for Sensor and intelligent detection technology	test	1	48		48	Autumn 4
	required	School of Intelligent Manufacturing and Control Engineering	b4011252	Intelligent Manufacturing Engineering Graduation Internship and Graduation Design (Thesis)	test	6	288		288	Spring 4
	Subtotal (Required Professional Practice)					**28.5**	**856**		**856**	
	Select different courses in different modules for 5 credits	Module A	b4011359	Production Internship in Smart Factory	test	2	48		48	Autumn 4
			b4011360	Comprehensive Practice for Intelligent manufacturing	test	3	72		72	Autumn 4
		Module B	b4011361	Intelligent manufacturing Internship	test	5	120		120	Autumn 4
		Subtotal (Selective Professional Practice)				5	120		120	
Subtotal (Professional Practice)						**33.5**	**976**		**976**	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	test	**1**	-	-	-	Autumn, Spring, Summer
Total						**166**	**3216**	**2014**	**1202**	

1. Explanation of Selective Professional Practice:

Selective Professional Practices are divided into modules and students must take one of the modules and achieve the required credits for that module.

(1) Module A: On-campus Practice Module for Intelligent manufacturing, focusing on cultivating students' ability to integrate and apply intelligent manufacturing systems and to operate and manage intelligent manufacturing factories, as well as improving engineering awareness, quality, safety, environmental awareness and hands-on skills.

(2) Module B: Off-campus Practice Module for intelligent manufacturing, focusing on cultivating students' understanding of advanced production concepts and organizational management methods of modern enterprises, and cultivating students' practical engineering skills and the ability to identify and solve problems.

2. Explanation of the relevance of professional certificates to the course:

Students who have passed the courses of Technology and applications of industrial robots, Application and Maintenance Practice of Industrial Robotics, CNC Machine Tools, Comprehensive Practice for CAD/CAM, Digital Design and Manufacturing, Sensor and Intelligent Inspection Technology, Machine Vision Technology and Application, Intelligent Manufacturing Production Management (MES/ERT) , can participate in the professional qualification certificate assessment related to this program: Certificate in Industrial Robot Operation and Demonstration (Special Occupational Competence) and Certificate in Machine Tool Repairer (Level 3), and can also take the examinations for professional certificates related to this program: Application and Maintenance Master of Intelligent Manufacturing System (Level 3 / Level 4), Master of Machine Vision System Technology Application (Level 3 / Level 4), Set-up and Maintenance Worker of CNC Machine Tool (Level 3 / Level 4), Operation and Adjustment Worker Certificate for Industrial Robot (Advanced), CAD/CAM Skills Certificate, etc.

Students who have obtained the Application and Maintenance Certificate for Intelligent Manufacturing Systems are eligible to apply for exemptions from the Industrial Robotics and Applications and CNC Machine Tools courses and receive the corresponding credits. Students who have obtained a certificate for Machine Vision Technology Application can apply for exemption from the Machine Vision Technology and Application course and receive the corresponding credits.

X. Credit of 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.