

**MASTER OF SCIENCE
IN MECHATRONICS ENGINEERING**

EVIDENCE C. Programme specification

1. Master of Mechatronics Programme Specification
2. Popular the Master of Mechatronics Programme Specification
 - On the website of HUST
 - On the website of SME
 - MME Program Flyer
 - During the events such as: Open Day, Annual Counseling, Welcome New Learners, Seminars, Career Guidance Activities.

GRADUATE PROGRAMME

Name of program:	Mechatronics Engineering
Education level:	Master
Major:	Mechatronics
Program code:	8520114
Duration:	1,5-2 years
Degree	Master
Credits in total:	61 credits

1. Program Goals

On successful completion of the program, students will be able to:

- 1.1. Update knowledge and new technology; mastering in-depth knowledge about Mechatronics engineering; analyze and synthesize to create and innovate in the field of manufacturing related to Mechatronics engineering, ready to integrate, adapt to the 4.0 revolution.
- 1.2. Knowledge and quality of professional ethical values, effectively contributing to the sustainable development of society Using modern knowledge, techniques, skills and tools to design, innovate and innovating Mechatronics engineering systems / processes / production; effectively and creatively apply scientific and technical achievements in Mechatronics engineering to solve practical problems; organize research, evaluate and experiment effectively in the environment of teaching and scientific research.
- 1.3. Scientific and professional working methods, systematic and analytical thinking, independent autonomy in approaching, organizing implementation and solving technical problems of Mechatronics engineering; ability to discuss, present professionally and participate, effectively lead in working groups (multidisciplinary), international integration.
- 1.4. Ability to self-training, self-update knowledge and self-scientific research, deployment of technical applications; have the knowledge base to continue studying at the doctorate level.

2. Program Learning Outcomes

On successful completion of the programme, students will be able to:

- 2.1. Have good knowledge base to adapt jobs that are relevant to the discipline, focusing on the ability to independently design, analyze, synthesize, and evaluate systems / processes/ technology products of mechatronics engineering and have ability to research or study at a higher level..
 - 2.1.1. *Ability to apply advanced mathematical and scientific knowledge to calculate, design and build systems / processes / mechatronics engineering products.*

- 2.1.2. *Ability to apply basic knowledge of the field of study to analyze, improve and improve Mechatronic engineering systems / processes / products.*
- 2.1.3. *The ability to apply innovative knowledge of specialized knowledge, exploit and use modern methods and tools to analyze, design and evaluate solutions / systems / processes / technical products Mechatronics and as a basis for scientific research and teaching.*
- 2.1.4. *The ability to independently apply in-depth knowledge to detect, analyze, design and develop, lead and operate Mechatronic engineering systems / processes / products; participating in proposing orientations and scientific researches; teaching and learning at a higher level.*
- 2.2. Be equipped with personal and professional skills and attributes to get achievements in career:
 - 2.2.1. *Analytical reasoning and identifying technical problems.*
 - 2.2.2. *Abilities to test, study and explore knowledge.*
 - 2.2.3. *Systematic thinking and critical thinking.*
 - 2.2.4. *Dynamic, creative and serious.*
 - 2.2.5. *Ethics and professional responsibilities.*
 - 2.2.6. *Capture contemporary issues and be self-study.*
- 2.3. Social skills needed to work effectively in a multidisciplinary team and in an international environment integration:
 - 2.3.1. *Collaborative, working, organizing, and leadership skills in multidisciplinary and multi-field groups.*
 - 2.3.2. *Effective communication skills through writing, presenting, discussing, negotiating, mastering situations, effectively using modern tools to teach and participate in scientific conferences.*
 - 2.3.3. *Skills to use English effectively at work..*
- 2.4. Ability to self-training, self-update knowledge and self study; be able to explore practical problems, creatively apply knowledge and scientific and technical achievements to solve practical problems in the mechatronics field:
 - 2.4.1. *Clearly aware of the close connection and influence of scientific and technical solutions to economic, social and environmental factors in the context of globalization.*
 - 2.4.2. *Ability to self-training, self-update knowledge, self-identify problems, the ability to give and create innovative solutions to practical problems in mechatronics engineering.*
 - 2.4.3. *Capacity to explore practical problems, design systems / processes / products / innovative technical solutions in the field of Mechatronics; Capacity to detect and organize research to solve practical problems.*
 - 2.4.4. *Capacity of executing / manufacturing / implementing systems / processes / products / technical solutions for mechatronics creation..*
 - 2.4.5. *Leadership of working groups operating / using / operating systems / processes / products / innovative technical solutions.*
- 2.5. Political qualities, a sense of service to the people, good health, meet the requirements of building and defending the homecountry:

Having a political qualification under the general program of the Ministry of Education and Training.

3. Admission requirements

- 3.1. Candidates who meet the admission requirements of Hanoi University of Science and Technology will be considered for admission.
- 3.2. Candidates must register online on the university's admissions page.
- 3.3. Training time: 1.5-2 years (depending on each student).

4. Training process, graduation conditions

The training process and graduation conditions apply the regulations on the University’s credit-based higher education training and vocational training.

5. Grades

The grades (A, B, C, D, F) and the corresponding 4-point scale are used to evaluate the official learning outcomes. The 10-Point scale is used for the explicit score of each component of a course.

	10-point system	4-point system	
		grade	points
Pass grade*	from 8,5 to 10	A	4,0
	from 7,0 to 8,4	B	3,0
	from 5,5 to 6,9	C	2,0
Fail grade	< 5,4	F	0

* For Final Project: A final grade of C or higher is considered a pass grade.

6. Program Content

6.1. General Program Structure

Professional component	Credit	Note
<i>General Education</i>	3	Philosophy subject for economic majors 4 TC Self-taught English. Students meet the output standard B1.
Major knowledge	12	Students enrolled in the integrated training program will receive 12 equivalent credits from the bachelor's program. Students not enrolled in an integrated training program will be awarded a maximum of 6 credits equivalent from their bachelor's training program and need to undertake a proposed research project of 6 credits in length.
Advanced specialized knowledge	21	This is a block of advanced and in-depth industry knowledge following the professional orientations of the training major. Advanced specialized knowledge block consists of 2 parts: 1. Credits are for regular courses. 2. Credits for 02 topics/seminar; each topic/seminar is 3 credits. This block is 6 credits.
Research-oriented elective module	10	Multiple research-oriented modules can be built. Students can choose from many modules, but once they have chosen a module, they must complete all the modules in that module. The number of credits can be adjusted between 12-15 credits; but must ensure that the total number of credits of the advanced specialized knowledge block and the research-oriented module is 30 credits.

Master thesis	15	The content of the master's thesis can be developed from the content of the research project at the bachelor's level
Total	61 credits (49 credits and 12 transfer credits from Bachelor program)	

6.2. Course list & Schedule

No	CODE	COURSES	CREDITS	SCHEDULE FOLLOWING STANDARD PLAN												
				1	2	3	4	5	6	7	8	9	10	11		
MASTER COURSE																
Transfer credits from Bachelor program			12													
General Knowledge (3 credits)																
59	SS6010	Philosophy	3(2,5-1-0-6)											3		
60	FL6010	English	Self-study													
Advanced specialized knowledge				21												
61	ME6008	Research project 1	3(0-0-6-6)												3	
62	ME6996	Research project 1	3(0-0-6-6)												3	
63	ME5510	Automation of hydraulic - Pneumatic systems	3(3-0-1-6)											3		
64	ME5511	Mechatronic System Design	2(2-1-0-4)												2	
65	ME5512	Project of Mechatronic System	3(3-0-1-6)												3	
66	IT3083	Computer Network	2(2-1-0-4)												2	
67	EE6868	Motor Systems and Control Design	3(3-0-1-6)												3	
68	IT4735	IoT and Applications	2(2-1-0-4)												2	
Research - oriented Elective Modules Module 1: Automatic Manufacturing System				10												
69	ME6601	Computer Aided Manufacturing	2(2-1-0-4)												2	
70	ME6602	Mechatronic System for Machine Tools	2(2-1-0-4)												2	
71	ME5092	Electrical Equipment in Machines	2(2-1-0-4)												2	
69	ME6616	Dynamics of Multibody System	2(2-1-0-4)												2	
70	ME6603	Motor Systems and Control Design	2(2-1-0-4)												2	
71	ME6604	Image processing in Mechatronics	2(2-1-0-4)												2	

Research –oriented Elective Modules Module 2: Automatic Equipment			10																
69	ME6211	Numerical Simulation of Dynamical System	2(2-1-0-4)																2
70	ME6605	Robot Operating System	2(2-1-0-4)																2
71	ME6606	FPGAs	3(3-0-1-6)																2
69	ME6607	Equipment mechatronics system	2(2-1-0-4)																2
70	ME6318	Planning and processing experimental data	3(3-0-1-6)																2
71	ME6608	FMS and CIM	2(2-1-0-4)																2
Research –oriented Elective Modules Module 3: Robot			10																
69	ME6350	Automatic measurement systems in mechanical	2(2-1-0-4)																2
70	ME6352	Theory and application of CNC	2(2-1-0-4)																2
71	ME6609	Micro Robot	2(2-1-0-4)																2
69	ME6610	Robot Design	2(2-1-0-4)																2
70	EE6122	Real-time supervisory control system	2(2-1-0-4)																2
71	ME6612	Nano sensor measures other	2(2-1-0-4)																2
Research –oriented Elective Modules Module 4: Intelligent			10																
69	ME6613	Micro-mechatronics systems	3(3-0-1-6)																2
70	ME6614	Equipment reliability and service life	2(2-1-0-4)																2
71	EE6122	Real-time supervisory control system	3(3-0-1-6)																2
69	ME6606	FPGAs	2(2-1-0-4)																2
70	ME6615	Intelligent mechatronics system	3(3-0-1-6)																2
71	IT6606	AI	2(2-1-0-4)																2
Master Thesis			15																
72	ME6001	Master thesis	15(0-0-30-30)																15
Total			61																

7. Date of issue and revision

The programme was issued in 2009, revised in 2014 and 2017.