MINISTRY OF EDUCATION AND TRAINING
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF MECHANICAL ENGINEERING

SOCIALIST REPUBLIC VIETNAM
Independence – Liberty – Happiness

INTEGRATED EDUCATION PROGRAM
BACHELOR-MASTER OF SCIENCE

Name of program:	*Mechanical Engineering*
Education level:	*Bachelor-Master*
Major:	*Mechanical Engineering*
Program codes:	*8520103 (Master)*
Duration:	*5,5 years*
Degrees:	*Bachelor in Mechanical Engineering* *& Master of Science in Mechanical Engineering*
Credits in total:	*180 credits*

1. Program Content

1.1 General Program Structure

BACHELOR'S PROGRAM		
Professional component	**Credits**	**Note**
General Education	***51***	
Mathematics and basic sciences	32	Major oriented
Law and politics	13	In accordance with regulations of Vietnam Ministry of Education and Training
Physical Education/ Military Education Military Education is for Vietnamese student only.	-	
English	6	02 basic English courses
Professional Education	***81***	
Basic and Core of Engineering	48 (±2)	Consist of at least 1÷3 projects
Soft skills	9	Include of 02 compulsory modules: - Social/Start-up/other skill (6 credits); - Technical Writing and Presentation (3 credits).
Elective Module	16 (±2)	Elective module provides specialized knowledge oriented towards different concentrations.
Bachelor research-based thesis	8	Bachelor research-based thesis is in form of a scientific report, its research topic is proposed by student. Student must carry out thesis under lecturer's supervision.
Total	**132** ***credits***	

MASTER'S PROGRAM		
Professional component	**Credits**	**Note**
General Education Philosophy English	3	Philosophy subject for economic majors 4 TC Self-taught English. Students meet the output standard B2.
Major knowledge	12	Students enrolled in the integrated curriculum will be be recognised 12 credits. Students who do not take the integrated curriculum will be recognised a maximum of 6 credits and need to undertake a proposed research project of 6 credits.
Advanced specialized knowledge	12÷15	This is a block of advanced and in-depth knowledge following the professional orientations of the major of study. Advanced major knowledge block consists of 2 parts: (i) Credits are for regular courses.

		(ii) Credit for 02 topics/seminars; each topic/seminar is 3 credits. This block is 6 credits in total.
Research-oriented elective module	15÷18	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 is developed from the content of the research project at the bachelor's level
Total	***48 credits and 12 transfer credits from Bachelor program***	
Total of integrated Program	***180 credits***	

1.2 Course list & Schedule

No	Course ID	Course Name	Credit	Semester										
				1	2	3	4	5	6	7	8	9	10	11
BACHELOR'S PROGRAM														
Philosophy and General Law			**12**											
1	SSH1110	Philosophy I	2(2-0-0-4)	2										
2	SSH1120	Philosophy II	3(2-1-0-6)		3									
3	SSH1050	Ho-Chi-Minh's Thought	2(2-0-0-4)				2							
4	SSH1130	Revolution Policy of Vietnamese Communist Party	3(2-1-0-6)					3						
5	EM1170	General Law	2(2-0-0-4)	2										
Physical Education			**5**											
6	PE1014	Theory in Sport	1(0-0-2-0)											
7	PE1024	Swimming	1(0-0-2-0)											
8	Elective courses	Elective Physical course 1	1(0-0-2-0)											
9	PE2010	Elective Physical course 2	1(0-0-2-0)											
10	PE2020	Elective Physical course 3	1(0-0-2-0)											
Military Education														
11	MIL1110	Vietnam Communist Party's Direction on the National Defense	0(3-0-0-6)											
12	MIL1120	Introduction to the National Defense	0(3-0-0-6)											
13	MIL1130	General Military Education	0(3-0-2-8)											
English			**6**											
14	FL1100	English I	3(0-6-0-6)	3										
15	FL1101	English II	3(0-6-0-6)		3									
Mathematics and Basic sciences			**32**											

16	MI1111	Calculus I	4(3-2-0-8)	4										
17	MI1121	Calculus II	3(2-2-0-6)		3									
18	MI1131	Calculus III	3(2-2-0-6)			3								
19	MI1141	Algebra	4(3-2-0-8)	4										
20	ME2030	Introduction to Manufacturing Engineering	2(2-1-0-4)			**2**								
21	PH1110	Physics I	3(2-1-1-6)		3									
22	PH1120	Physics II	3(2-1-1-6)			3								
23	IT1110	Introduction to Computer Science	4(3-1-1-8)		4									
24	MI2110	Calculation Methods and Matlab	3(2-0-2-6)				**3**							
25	ME2011	Engineering Graphics I	3(3-1-0-6)			**3**								
Basic and Core of Engineering			**50**											
26	ME2201	Engineering Graphics II	2(2-1-0-4)				2							
27	EE2012	Electrical Engineering	2(2-1-0-4)				2							
28	ET2012	Electronic Engineering	3(3-0-1-6)					2						
29	ME2000	Introduction to Mechanical Engineering	3(2-1-1-6)			3								
30	ME2112	Engineering Mechanics I	2(2-1-0-4)			2								
31	ME2211	Engineering Mechanics II	3(2-2-0-6)				3							
32	ME2101	Strength of Materials I	2(2-0-1-4)			2								
33	ME2202	Strength of Materials II	2(2-0-1-4)				2							
34	ME2203	Theory of Machines	3(3-0-1-6)				2							
35	ME3101	Machine Element Design	2(2-0-1-4)					2						
36	ME3201	Fundamental of Machine Tools	2(2-0-1-4)						2					
37	ME3202	Automation Control Engineering	2(2-0-1-4)						2					
38	ME3102	Principle of Metal Cutting	2(2-0-1-4)					2						
39	ME3205	Manufacturing Technology	3(3-0-1-6)						3					
40	ME3103	Tolerances and Measurement Techniques	3(3-0-1-6)					3						
41	MSE2228	Materials Science	2(2-0-1-4)				2							
42	ME4181	Finite Element Methods	2(2-1-0-4)							2				
43	ME3232	Project of Machine Element Design	2(0-0-4-4)						2					
44	ME4159	Jigs and Fixtures	2(2-0-1-4)							2				
45	TE3602	Fluid Engineering	3(2-1-1-6)						2					
46	HE2012	Thermal Engineering	2(2-1-0-4)					2						
47	ME3104	Workpiece Fabrication	2(2-0-1-4)					2						
48	ME3203	Metal Forming Technology	2(2-0-1-4)						2					
		Total of credits		15	16	18	18	16	13	4	0			
Soft Skills			**9**											
49	EM1010	Introduction to Management	2(2-0-0-4)	2										
50	EM1180	Business Culture and Entrepreneurship	2(2-1-0-4)							2				
51	ED3280	Applied Psychology	2(1-2-0-4)			2								
52	ED3220	Soft Skills	2(1-2-0-4)							2				
53	ET3262	Technology and Technical Design Thinking	2(1-2-0-4)					2						
54	TEX3123	Industrial Design	2(1-2-0-4)						2					

55	ME2021	Technical Writing and Presentation	3(2-2-0-6)							3			
		Total of credits		2	0	2	0	2	2	4	3			
Elective Module														
Module 1: Manufacturing Engineering			**16**											
56	ME3122	Workshop Practice	2(0-0-4-4)					2						
57	ME4148	CNC Machine Tools and Industrial Robot	3(3-0-1-6)							3				
58	ME4187	CNC Technology	3(3-0-1-6)							3				
59	ME4168	Design of Machine Tools	3(3-0-1-6)							3				
60	ME3260	Design of Cutting Tools	3(3-0-1-6)						3					
61	ME4169	Project of Cutting Tools Design	2(0-0-4-4)							2				
62	ME4251	Engineering Practicum	2(0-0-4-4)								2			
63	ME4955	Bachelor Thesis	6(0-0-12-12)								6			
		Total bạhelor's program Credits	**133**	15	16	18	18	18	19	18	11			
Module 2: Forming and Deformation Processes			**16**											
56	ME3122	Workshop Practice	2(0-0-4-4)					2						
57	ME4025	Theory of Metal Forming	2(2-1-0-4)							2				
58	ME3266	Equipment for Metal Forming Technology	3(3-0-1-6)						3					
59	ME4055	Sheet Metal Forming Technology	2(2-0-1-4)							2				
60	ME4065	Massive Metal Forming Technology	2(2-0-1-4)							2				
61	ME4189	Project of Metal Forming	2(0-0-4-4)							2				
62	ME4188	Advanced Technologies for metal forming	3(3-0-1-6)							3				
63	ME4251	Engineering Practicum	2(0-0-4-4)								2			
64	ME4955	Bachelor Thesis	6(0-0-12-12)								6			
		Total bạhelor's program Credits	**133**	15	16	18	18	18	19	18	11			
Module 3: Welding Technology			**16**											
56	ME3122	Workshop Practice	2(0-0-4-4)					2						
57	ME3267	Welding Processes	2(2-0-1-4)						2					
58	ME4129	Welding Equipment	2(2-0-1-4)							2				
59	ME4139	Welding Materials	2(2-0-1-4)							2				
60	ME4138	Metal Welding Technology	3(3-0-1-6)							3				
61	ME4128	Calculation and Design of Welded Structures	3(3-1-0-6)							3				
62	ME4127	Quality Assurance and Control in Welding Fabrication	2(2-0-1-4)							2				
63	ME4251	Engineering Practicum	2(0-0-4-4)								2			
64	ME4955	Bachelor Thesis	6(0-0-12-12)								6			
		Total bạhelor's program Credits	**133**	15	16	18	18	18	18	19	11			
Module 4: Precision and Optical Engineering			**16**											

56	ME3122	Workshop Practice	2(0-0-4-4)					2						
57	ME3208	Precison Engineering	2(2-0-1-4)						2					
58	ME4178	Electro-Optics Measuring Systems	2(2-0-1-4)							2				
59	ME4179	Signal Processing in Mechanical Measurement	2(2-0-1-4)							2				
60	ME4013	Precise Elements and Mechanism	2(2-0-1-4)							2				
61	ME4063	Micro-Electro-Mechanical Systems	2(2-1-0-4)							2				
62	ME4149	Quality Controls	2(2-1-0-4)							2				
63	ME4117	Project of Precision Machine	2(0-0-4-4)							2				
64	ME4251	Engineering Practicum	2(0-0-4-4)								2			
65	ME4955	Bachelor Thesis	6(0-0-12-12)								6			
		Total bạhelor's program Credits	**133**	15	16	18	18	18	18	19	11			
Module 5: Plastic and Composite Technology			**16**											
56	ME3122	Workshop Practice	2(0-0-4-4)					2						
57	ME4037	Mechanics of Plastic and Composite Materials	2(2-0-1-4)							2				
58	ME4038	Composite Manufacturing Technology	2(2-0-0-4)							2				
59	ME3252	Plastic and Composite Materials	2(2-0-0-4)						2					
60	ME4039	Mechanics of Polymeric Liquids	2(2-1-0-4)							2				
61	ME4073	Polymer Injection Molding Process and Equipment	2(2-0-1-4)							2				
62	ME4077	Polymer Extrussion Process and Equipments	2(2-1-0-4)							2				
63	ME4146	Project of Plastic Mold	2(0-0-4-4)							2				
64	ME4251	Engineering Practicum	2(0-0-4-4)								2			
65	ME4955	Bachelor Thesis	6(0-0-12-12)								6			
		Total bạhelor's program Credits	**133**	15	16	18	18	18	18	19	11			
MASTER'S PROGRAM														
Credits recognized under the integrated program			**12**											
General knowledge (3 credits)														
66	SS6010	Philosophy	3(3-0-0-6)									3		
67	FL6010	English	*Selfstudy*											
Seminar														
68	ME6006	SE1: Overview of the Study	3(3-0-0-6)										3	
69	ME6868	SE2: Thereotical Background of the Study	3(3-0-0-6)										3	
Manufacturing Engineering														
Core courses (13 credits)			**13**											
70	ME5503	Manufacturing Technology II	3(3-0-1-6)									3		
71	ME5562	Project of Machine tool design	2(0-0-4-4)									2		

72	ME5242	Technology of forming cutting tools	2(2-1-0-4)								2		
73	ME5180	Machining Process Planning Project	2(0-0-4-4)								2		
74	ME5552	Tribology engineering	2(2-1-0-4)								2		
75	ME5314	CAD/CAM/CAE Technology	2(2-1-0-4)								2		
Elective courses-Select one of two modules			**11**										
Module 1													
64	ME6311	Advanced Machines and Equipments in Production Processes	2(2-1-0-4)									2	
65	ME6321	Finishing Process with Abrasive Machining	2(2-1-0-4)									2	
66	ME6320	Theory of forming surfaces by cutting tools	2(2-0-0-4)									2	
67	ME6969	Advanced Production and Operation Management	3(3-1-0-6)									3	
68	ME5093	Laser Engineering	2(2-0-1-4)									2	
Module 2													
64	ME6380	Reliability and durability of mechanical equipments	2(2-1-0-4)									2	
65	ME6328	Optimisation of cutting process	2(2-1-0-4)									2	
66	ME6330	Methods of Assessing the Precision Of Metal-Cutting	2(2-1-0-4)									2	
67	ME6968	Modular Design of CNC machine tools	3(3-1-0-6)									3	
68	ME6112	Vibration and Machine Dynamics	2(2-1-0-4)									2	
Master Thesis													
	LV6001	Master Thesis Plan	3(0-0-6-6)										3
69		Master Thesis	12(0-0-24-24)										12
Total bạhelor-master's program Credits			**180**								16	17	15
Field of study 2: Precision and Optical Engineering													
List of core courses			**13**										
58	ME5260	Project of Mechanical Measuring System Design	3(0-0-6-6)								3		
59	ME5261	Vacuum technology and Optic thin films	2(2-1-0-4)								2		
60	ME5262	Computer interfacing and mechanical device control	3(3-1-0-6)								3		
61	ME5093	Laser Engineering	2(2-0-1-4)								2		
62	ME5263	Electro-optic Systems Design	3(3-1-0-6)								3		
Elective courses-Select one of two modules			**11**										
Module 1													
63	ME6372	Precision Machine Design	3(3-1-0-6)									3	
64	ME6371	Micro-Electro-Mechanical Systems	3(3-1-0-6)									3	
65	ME6350	Automatic measurement systems in mechanical engineering	3(3-1-0-6)									3	

66	ME6112	Vibration and Machine Dynamics	2(2-1-0-4)									2		
Module 2														
63	ME6368	Mechanical measuring instruments	2(2-1-0-4)									2		
64	ME6367	Precise Surface Engineering	3(3-1-0-6)									3		
65	ME6350	Automatic measurement systems in mechanical engineering	3(3-1-0-6)									3		
66	ME6369	Design and Fabrication of Die	3(3-1-0-6)									3		
Master Thesis			**15**											
	LV6001	Master Thesis Plan	3(0-0-6-6)											3
67		Master Thesis	12(0-0-24-24)											12
Total bạhelor-master's program Credits			**180**									16	17	15
Field of study 3: Plastic and Composite Technology														
List of core courses			**13**											
58	ME5410	Polymer Rheology	2(2-1-0-4)									2		
59	ME5413	Modeling of composite materials	3(3-1-0-6)									2		
60	ME6399	Continuum mechanics	3(3-1-0-6)									3		
61	ME6391	Mathematical modeling in mechanics	2(2-1-0-4)									3		
62	ME6395	Structural Mechanics	3(3-1-0-6)									3		
Elective courses-Select one of two modules			**11**											
Module 1														
63	ME6392	Advanced Finite Element Method	2(2-1-0-4)									2		
64	ME6396	Theory of elasticity and fracture mechanics	3(3-1-0-6)									2		
65	ME6390	Theory of Applied Plasticity	2(2-1-0-4)									3		
66	ME6112	Vibration and Machine Dynamics	2(2-1-0-4)									2		
67	ME6211	Numerical Simulation of Dynamical Systems	2(2-1-0-4)									2		
MĐ2-Module 2														
63	ME6392	Advanced Finite Element Method	2(2-1-0-4)									2		
64	ME5414	Plastic and composite processing	3(3-1-0-6)									2		
65	ME5411	Rubber material and processing	2(2-1-0-4)									2		
66	ME6360	Numerical Simulation for material machining and forming process	2(2-1-0-4)									3		
67	ME6318	Planning and processing experimental data	2(2-1-0-4)									2		
Master Thesis			**15**											
	LV6001	Master Thesis Plan	3(0-0-6-6)											3
68		Master Thesis	12(0-0-24-24)											12
Total bạhelor-master's program Credits			**180**									16	17	15
Field of study 4: Welding Technology														
List of core courses			**14**											
58	ME5420	Theory of welding metallurgical process	2(2-0-1-4)									2		
59	ME5421	Heat transfer in welding	3(3-1-0-6)									3		

60	ME5422	Optimization of welding technology	2(2-1-0-4)								2		
61	ME5423	Control of Welding Systems	3(3-1-0-6)								3		
62	ME5424	Behavior of welded structures under dynamic loading	2(2-1-0-4)								2		
63	ME5425	Non-metallic Material Welding Technology	2(2-0-0-4)								2		
Elective courses-Select one of two modules			**10**										
Module 1													
64	ME6425	Analyze the microstructure of welded joints	3(3-1-0-6)									3	
65	ME6426	Weldability of metal materials	2(2-1-0-4)									2	
66	ME6429	New Welding Technologies	3(3-1-0-6)									3	
67	ME6424	Numerical simulation of the welding processes	2(2-1-0-4)									2	
Module 2													
64	ME6425	Analyze the microstructure of welded joints	3(3-1-0-6)									3	
65	ME6429	New Welding Technologies	3(3-1-0-6)									3	
66	ME6427	Heat Treatment in Welding	2(2-1-0-4)									2	
67	ME6428	Advanced Welding Equipment	2(2-1-0-4)									2	
Master Thesis			**15**										
	LV6001	Master Thesis Plan	3(0-0-6-6)										3
68		Master Thesis	12(0-0-24-24)										12
Total bạhelor-master's program Credits			**180**	0	0	0	0	0	0	0	0	17	16	15
Field of study 5: Forming and Deformation Processes														
List of core courses			**13**											
58	ME5310	Modeling and numerical simulation of forming process	2(2-1-0-4)								2		
59	ME5311	Automation of Forming Process	2(2-1-0-4)								2		
60	ME5312	CNC and PLC pressing machines	2(2-1-0-4)								2		
61	ME5313	Design and Fabrication of Die	3(3-1-0-6)								3		
62	ME5316	Project in Design and fabrication of Die	2(0-0-4-4)								2		
63	ME5317	Geometric Tolerances and Assemblies	2(2-1-0-4)								2		
Elective courses-Select one of two modules			**11**										
Module 1													
64	ME6380	Theory of plasticity	3(3-1-0-6)									3	
65	ME6382	Special Metal Forming Technologies	3(3-0-0-6)									3	
66	ME6383	Microforming Technologies	3(3-1-0-6)									3	
67	ME6368	Mechanical measuring instruments	2(2-1-0-4)									2	
MĐ2-Module 2													
64	ME6380	Theory of plasticity	3(3-1-0-6)									3	

65	ME6382	Special Metal Forming Technologies	3(3-0-0-6)										3	
66	ME6381	Roll forming	3(3-1-0-6)										3	
67	ME5093	Laser Engineering	2(2-0-1-4)										2	
Master Thesis			**15**											
	LV6001	Master Thesis Plan	3(0-0-6-6)											3
68		Master Thesis	12(0-0-24-24)											12
Total bạhelor-master's program Credits			**180**	0	0	0	0	0	0	0	0	18	15	15