Curriculum Framework for the Talented Engineer Program in Mechanical Engineering Technology

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
9.1		**General Education**	**59**								
9.1.1		**Social Sciences and Humanities**	**19**								
9.1.1.1		***Compulsory Courses***	**15**								
1.	LP6024	Marxist–Leninist Philosophy	3	3	0	0	0	0	2		
2.	LP6025	Marxist–Leninist Political Economy	2	2	0	0	0	0	4		
3.	LP6026	Scientific Socialism	2	22	0	0	0	0	6		
4.	LP6027	History of the Communist Party of Vietnam	2	2	0	0	0	0	7		
5.	LP6022	Ho Chi Minh Thought	2	2	0	0	0	0	6		
6.	LP6021	Introduction to Law	2	2	0	0	0	0	6		
7.	BS6046	Intercultural Communication	2	2	0	0	0	0	3		
9.1.1.2		***Electives (Select one course from Group 1 and one from Group 2)***	***4***								
Tc1		**Group 1**	**2**								

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
8.	BS6049	People and the Environment	2	2	0	0	0	0	*3*		
9.	BS6047	Introduction to Scientific Research	2	2	0	0	0	0	*3*		
10.	BS6048	Labor Relations and Employment	2	2	0	0	0	0	*3*		
11.	SE6257	Project Management	2	2	0	0	0	0	*3*		
12.	SE6218	Introduction to Economics	2	2	0	0	0	0	*3*		
13.	SM6186	Professional Work Practices	2	2	0	0	0	0	*3*		
14.	SM6233	Technological Thinking and Engineering Design	2	2	0	0	0	0	*3*		
15.	SM6234	Creative Engineering Techniques	2	2	0	0	0	0	*3*		
Tc2		**Group 2**	**2**								
16.	BS6050	Introduction to Music	2	2	0	0	0	0	*4*		
17.	BS6052	Introduction to Fine Arts	2	2	0	0	0	0	*4*		
18.	BS6051	Introduction to Arts Studies	2	2	0	0	0	0	*4*		
9.1.2	**Select one of five foreign-language course programs**		**10**	**10**	**0**	**0**	**0**	**0**			

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
		Chinese Language Course Program									
	SL6347	*Chinese 1*	5	5	0	0	0	0	4		
	SL6348	*Chinese 2*	5	5	0	0	0	0	5		
		Korean Language Course Program									
	SL6351	*Korean 1*	5	5	0	0	0	0	4		
	SL6352	*Korean 2*	5	5	0	0	0	0	5		
		Japanese Language Course Program									
	SL6349	*Japanese 1*	5	5	0	0	0	0	4		
	SL6350	*Japanese 2*	5	5	0	0	0	0	5		
		English Language Course Program									
	SL6325	*English for Specific Purposes 1*	5	5	0	0	0	0	4		
	SL6326	*English for Specific Purposes 2*	5	5	0	0	0	0	5		
9.1.3		**Natural Sciences**	**30**	**21**							

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
9.1.3.1		***Compulsory Courses***	*30*	15							
	BS6056	Calculus 1	3	2	1	0	0	0	1		
	BS6037	Linear Algebra	3	3	0	0	0	0	2		
	BS6057	Calculus 2	3	3	0	0	0	0	2	BS6056	
	BS6042	Probability and Statistics	3	3	0	0	0	0	3		
	BS6059	Calculus 3	3	3	0	0	0	0	3	BS6057	
	SC6221	Numerical Methods in Programming	3	3	0	0	0	0	4		
	SC6245	Optimization	3	3	0	0	0	0	4	BS6037; BS6059	
	BS6027	General Physics	3	2	1	0	0	0	1		
	BS6041	Physics 2	3	3	0	0	0	0	2	BS6027	
	CT6279	General Chemistry	3	3	0	0	0	0	1		
9.1.3.2		***Electives***	***0***								
		National Defense and Security Education	**0**						1		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
		In accordance with Circular No. 05/2020/TT-BGDDT dated 18 March 2020									
		Physical Education	**0**						1,2,3		
		In accordance with the current regulations of Hanoi University of Industry									
9.2		**Professional Education**	**101**	**-**	**-**	**-**	**-**	**0**			
9.2.1		**Foundations of the Engineering Discipline**	**32**	**25**	**-**	**0**	**0**	**0**			
9.2.1.1		**Compulsory Courses**	**30**	**28**	**2**	**0**	**0**	**0**			
	SM6050	Engineering Drawing	3	3	0	0	0	0	1		
	SC6201	Digital Competency Development	3	2	1	0	0	0	6		
	SC6208	Programming Techniques	3	2	1	0	0	0	3		
	SM6176	Industrial Safety and Environment	2	2	0	0	0	0	3		
	SM6236	Engineering Materials	3	3	0	0	0	0	1		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SEE6164	Electrical and Electronic Engineering	3	3	0	0	0	0	4		
	SM6237	Engineering Mechanics 1	3	3	0	0	0	0	2		
	SM6238	Strength of Materials 1	2	2	0	0	0	0	3		
	SM6054	Theory of Mechanisms	2	2	0	0	0	0	4	SM6240	
	SM6056	Machine Elements	2	2	0	0	0	0	5	SM6239	
	SM6239	Strength of Materials 2	2	2	0	0	0	0	4	SM6238	
	SM6240	Engineering Mechanics 2	2	2	0	0	0	0	3	SM6237	
9.2.1.2		**Electives**	**2**		***2***						
	SM6235	Engineering Computation and Programming	2	1	1	0	0	0	5		
	SM6265	Mechanical Behavior of Nanomaterials	2	2	0	0	0	0	5		
	SM6266	Fatigue Analysis and Design	2	2	0	0	0	0	5		
	SM6267	Computational Engineering	2	1	1	0	0	0	5		
9.2.2		**Foundations of the Major Group**	**29**								

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
9.2.2.1		**Compulsory Courses**	**27**								
	SM6138	Basic Mechanical Engineering Practice	2	0	2	0	0	0	2		
	SM6048	Introduction to Engineering	2	2	0	0	0	0	1		
	ME6166	Scientific Research Methods	2	1	0	1	0	0	1		
	SM6059	Tolerances and Measurement Techniques	2	2	0	0	0	0	5		
	SM6057	Fundamentals of Mechanical Design Laboratory	1	0	1	0	0	0	6	SM6138: SM6236	
	SM6153	Tolerances and Measurement Practice	1	0	1	0	0	0	5		
	SM6049	Introduction to Engineering Project	1	0	1	0	0	0	2		SM6048
	SM6195	CAD	2	0	2	0	0	0	3		
	SM6190	Engineering Thermodynamics	2	2	0	0	0	0	5		
	SM6180	Machine Elements Project	2	0	0	0	2	0	6		SM6056
	SM6241	Modeling and Simulation of Automated Mechanical Systems	2	1	0	1	0	0	8		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SM6183	Specialized Engineering Drawing	2	1	0	1	0	0	2	SM6050	
	SM6061	Fundamentals of Hydraulics	2	2	0	0	0	0	5		
	SM6242	Automated Measurement in Mechanical Manufacturing	2	1	0	1	0	0	7	SM6123; SM6059	
	SM6123	Automation Engineering	2	1	1	0	0	0	5		
9.2.2.2		**Electives**	**2**	**2**	**0**	**0**	**0**	**0**			
	SM6268	Principles and Applications of Digital Design	2	2	0	0	0	0	7		
	SM6269	Design Automation	2	1	1	0	0	0	7		
	SM6270	Principles of Laser Material Processing	2	2	0	0	0	0	7		
	GF6188	Principles of Visual Design	2	2	0	0	0	0	7		
	SM6248	Functional Polymer Technology	2	2	0	0	0	0	7		
	SM6244	Smart Materials Technology	2	2	0	0	0	0	7		
	SEE6152	Measurement and Sensor Engineering	2	2	0	0	0	0	7		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SM6122	Robotics Engineering	2	2	0	0	0	0	7		
	SM6247	Product Innovation and Service Engineering	2	2	0	0	0	0	7		
9.2.4		**Specialized Knowledge**	**40**	**24**	**-**	**-**	**-**	**0**			
9.2.4.1		***Compulsory Courses***	**36**	**22**	**7**	**5**	**2**	**0**			
	SM6065	Machine Manufacturing Technology	3	3	0	0	0	0	7	SM6249: SM6254	
	SM6119	Hydraulic and Pneumatic Automation Systems	2	2	0	0	0	0	6	SM6061	
	SM6249	Metal Cutting Principles (Talent Engineer Program)	2	2	0	0	0	0	5	SM6236	
	SM6271	CAD/CAM Practice and Rapid Prototyping	2	0	2	0	0	0	8	SM6195	
	SM6250	Process Optimization and Quality Management	2	1	0	1	0	0	9		
	SM6251	Fixture System Design (Talent Engineer Program)	2	1	0	1	0	0	7		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SM6252	Machine Manufacturing Technology Project (Talent Engineer Program)	2	0	0	0	2	0	8	SM6251	SM6065
	SM6068	Machine Manufacturing Technology Laboratory	1	0	1	0	0	0	8		
	SM6272	CNC Engineering	2	2	0	0	0	0	8		
	SM6253	Artificial Intelligence in Mechanical Engineering	2	2	0	1	0	0	8		
	ME6168	Experimental Design and Analysis	2	1	1	0	0	0	7		
	SM6254	Machine Tools (Talent Engineer Program)	2	2	0	0	0	0	6	SM6054	
	SM6255	Advanced Materials Technology	2	2	0	0	0	0	6		
	SM6273	Mechanical System Design Project	2	0	2	0	0	0	9	SM6251	
	SM6086	Product Design and Development	2	1	0	1	0	0	9		
	ME6170	Finite Element Applications in Mechanical Engineering	2	1	1	0	0	0	7		
	SM6256	Advanced Manufacturing Systems	3	2	0	1	0	0	9		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
9.2.4.2		***Electives***									
		Electives (Select one course from Group 1 and one from Group 2)									
		Group 1	**2**	**0**	**2**	**0**	**0**	**0**			
	SM6181	Electrical Discharge Machining Practice	2	0	2	0	0	9	9		
	SM6196	CNC Practice	2	0	2	0	0	9	9		
	SM6182	Robotics Practice	2	0	2	0	0	9	9		
	SM6201	Artificial Intelligence Practice	2	0	2	0	0	9	9		
	SEE6163	PLC Programming Practice	2	0	2	0	0	9	9		
	SM6187	Mechatronics Practice	2	0	2	0	0	9	9		
9.3		***Group 2 (Select one course from the group)***	2	**2**	**0**	**0**	**0**	**0**			
	SC6272	Artificial Intelligence for Manufacturing Data Processing	2	2	0	0	0	0	8		
	SM6274	Smart Manufacturing System Design	2	1	0	1	0	0	8		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
		Seminar									
	SEE6168	Smart Manufacturing Information Systems	2	2	0	0	0	0	8		
	SM6258	Digital Engineering in Mechanical Engineering	2	1	0	1	0	0	8		
	SM6010	Decision-Making Techniques	2	2	0	0	0	0	8		
	SM6012	Analysis and Design of Management Information Systems	2	2	0	0	0	0	8		
	SM6204	Industrial Design	2	1	0	1	0	0	8		
	SM6275	Applications of Laser Technology in Mechanical Engineering	2	2	0	0	0	0	8		
	SM6276	Advanced Laser Techniques for Metrology and Micro/Nano Manufacturing	2	2	0	0	0	0	8		
	SM6259	Digital Image Processing and Machine Vision	2	1	1	0	0	0	8		
	SM6260	Digital Twin Engineering and Simulation in Mechanical Design	2	1	0	1	0	0	8		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SEE6008	Robot-Integrated Automation Systems	2	1	0	1	0	0	8		
	SM6261	Automated Digital Technology	2	1	0	1	0	0	8		
	SM6004	Smart Manufacturing Systems	2	2	0	0	0	0	8		
	SM6262	Industrial Data Engineering in Mechanical Engineering	2	1	0	1	0	0	8		
	SM6277	Manufacturing Performance Analysis and Evaluation	2	1	1	0	0	0	8		
	SM6278	Development of Engineering Systems	2	1	0	1	0	0	8		
	SM6279	Machine Learning in Digital Manufacturing	2	1	0	1	0	0	8		
	SM6280	3D Printing and Additive Manufacturing	2	1	1	0	0	0	8		
	SM6281	Additive Manufacturing with Biomaterials and Biopolymers	2	1	1	0	0	0	8		
	SM6282	Sustainable Energy Design and Systems	2	1	0	1	0	0	8		
9.3.2		**Free Elective Support Courses**	**2**	**2**	**0**	**0**	**0**	**0**			
		Compulsory Courses	2	2	0	0	0	0	7		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SE6209	Innovation and Entrepreneurial Mindset	2	2	0	0	0	0	7		
		Electives (Select one of four foreign-language course-program groups)	0	0							
		Chinese Language Course Program									
	FL6560	Basic Chinese 1	0						2		
	FL6561	*Basic Chinese 2*	0						3		
		Korean Language Course Program									
	FL6564	*Basic Korean 1*	0						2		
	FL6565	*Basic Korean 2*	0						3		
		Japanese Language Course Program									
	FL6562	*Basic Japanese 1*	0						2		
	FL6563	*Basic Japanese 2*	0						3		
		English Language Course Program									
	SL6325	*Basic English 1*	0						2		

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Breakdown					Sem.	Prior Course	Prerequisite Code
				Theory	Practice / Lab	Disc./Assign.	Project	Intern.			
	SL6326	*Basic English 2*	0						3		
		Industry Internship and Graduation Project/Thesis	**18**	**0**	**0**	**0**	**10**	**8**			
	SM6263	Industry Internship	8	0	0	0	0	8	10		
	SM6264	Graduation Project/Thesis	10	0	0	0	10	0	10		
Total Credits (Excluding Physical Education and National Defense and Security Education)			180	-	-	-	10	8	-		