Curriculum Framework for Industrial & Systems Engineering

No.	Course Code	Area / Course Title	Total Cr.	Credit Components					Sem.	Prereq. Code
				Lec.	Prac./Lab	Disc./Assign.	Proj.	Intern.		
9.1		**General Education**	**59**	**54**	**4**	**1**	**0**	**0**		
9.1.1		**Political Theory and Law**	**13**	**13**	**0**	**0**	**0**	**0**		
1	LP6024	Marxist-Leninist Philosophy	3	3	0	0	0	0	2	
2	LP6025	Marxist-Leninist Political Economy	2	2	0	0	0	0	3	
3	LP6026	Scientific Socialism	2	2	0	0	0	0	4	
4	LP6022	Ho Chi Minh Thought	2	2	0	0	0	0	5	
5	LP6027	History of the Communist Party of Vietnam	2	2	0	0	0	0	6	
6	LP6021	Introduction to Law	2	2	0	0			7	
9.1.2		**Natural Sciences**	**27**	**23**	**3**	**1**	**0**	**0**		
9.1.2.1		***Compulsory***	***24***	***20***	***3***	***1***	***0***	***0***		
1	BS6037	Linear Algebra	3	3	0	0	0	0	1	
2	BS6038	Calculus	3	3	0	0	0	0	1	
3	BS6054	General Physics	3	2	1	0	0	0	1	
4	BS6042	Probability and Statistics	3	3	0	0	0	0	2	
5	CT6279	General Chemistry	3	2	1	0	0	0	2	
6	SM6023	Operations Research	3	2	0	1	0	0	5	BS6037
7	SM6017	Industrial Statistics	2	2	0	0	0	0	4	BS6042
8	SM6018	Industrial Statistical Data Analysis Practice	1	0	1	0	0	0	5	SM6017
9	BS6040	Engineering Mathematics	3	3	0	0	0	0	2	
9.1.2.2	**TcKHTN**	***Electives (select one of the courses)***	**3**	**3**	**0**	**0**	**0**	**0**	**3**	
10	BS6039	Numerical Methods	3	3	0	0	0	0		

11	SC6223	Discrete Mathematics	3	3	0	0	0	0		BS6037
12	BS6045	Mathematical Modeling	3	3	0	0	0	0		
13	SC6245	Optimization	3	3	0	0	0	0		
14	BS6041	Physics II	3	3	0	0	0	0		BS6054
15	SC6221	Numerical Methods in Programming	3	3	0	0	0	0		
9.1.3		**Social Sciences and Humanities**	**6**	**6**	**0**	**0**	**0**	**0**		
9.1.3.1		***Compulsory***								
1	BS6018	Intercultural Communication	2	2	0	0	0	0	1	
9.1.3.2		***Electives (select one course from Group 1 and one from Group 2)***	**4**	**4**	**0**	**0**	**0**	**0**		
	TcKHNV1	**Group 1**	**2**	**2**	**0**	**0**	**0**	**0**	**2**	
2	SM6186	Professional Work Practices	2	2	0	0	0	0		
3	BS6047	Introduction to Scientific Research	2	2	0	0	0	0		
4	BS6048	Labor Relations and Employment	2	2	0	0	0	0		
5	BS6049	Humans and the Environment	2	2	0	0	0	0		
6	SE6257	Project Management	2	2	0	0	0	0		
7	SE6128	Introduction to Economics	2	2	0	0	0	0		
	TcKHNV2	**Group 2**	**2**	**2**	**0**	**0**	0	0	**4**	
8	BS6050	Introduction to Music	2	2	0	0	0	0		
9	BS6051	Introduction to Art Studies	2	2	0	0	0	0		
10	BS6052	Introduction to Fine Arts	2	2	0	0	0	0		
9.1.4	**Select one of four foreign language programs**		**10**	**10**	**0**	**0**	**0**	**0**		
	TcNN1	**Chinese Language Program**								

1	SL6347	*Chinese 1*	5	5	0	0	0	0	4	FL6561
2	SL6348	*Chinese 2*	5	5	0	0	0	0	5	SL6347
	TcNN2	**Korean Language Program**								
1	SL6351	*Korean 1*	5	5	0	0	0	0	4	FL6564
2	SL6352	*Korean 2*	5	5	0	0	0	0	5	FL6565
	TcNN3	**Japanese Language Program**								
1	SL6349	*Japanese 1*	5	5	0	0	0	0	4	
2	SL6350	*Japanese 2*	5	5	0	0	0	0	5	FL6563
	TcNN4	**English Language Program**								
1	SL6325	*English for Mechanical and Automotive Engineering 1*	5	5	0	0	0	0	4	
2	SL6326	*English for Mechanical and Automotive Engineering 2*	5	5	0	0	0	0	5	
	TcNN5	**German Language Program**								
1	FL6582	*German 1*	5	5	0	0	0	0	4	FL6580
2	FL6583	*German 2*	5	5	0	0	0	0	5	FL6581
9.1.5		**Digital Technology and Applications**	**3**	**2**	**1**	**0**	**0**	**0**	**4**	
	SC6201	Digital Competency Development	3	2	1	0	0	0		
9.1.6		**National Defense and Security Education**	**8.5**	**6**	**2.5**	0	0	0	1	
		In accordance with Circular No. 05/2020/TT-BGDDT dated March 18, 2020								
9.1.7		**Physical Education**	**3**	**0**	**3**	**0**			1,2	
		In accordance with the current regulations of Hanoi University of Industry	3	0	3	0	0	0		

9.2		**Professional Education**	**76**	**46**	**11**	**1**	**11**	**7**		
9.2.1		***Foundational Knowledge***	**36**	**26**	**9**	**0**	**1**	**0**		
9.2.1.1		***Field Foundational Knowledge***	**11**	**9**	**2**	**0**	**0**	**0**		
1	SM6050	Engineering Drawing	3	3	0	0	0	0	1	
2	SC6208	Programming Techniques	3	2	1	0	0	0	3	
3	SM6176	Industrial Safety and Environment	2	2	0	0	0	0	3	
4	SEE6164	Electrical and Electronic Engineering	3	2	1	0	0	0	3	BS6002
9.2.1.2		***Discipline Group Foundational Knowledge***	**9**	**6**	**2**	**0**	**1**	**0**		
5	SM6048	Introduction to Engineering	2	2	0	0	0	0	1	
6	SM6049	Introduction to Engineering Project	1	0	0	0	1	0	2	
7	SM6058	Theory of Mechanisms and Machine Elements	2	2	0	0	0	0	4	
8	SM6138	Basic Mechanical Engineering Practice	2	0	2	0	0	0	2	
9	SM6001	General Mechanical Engineering	2	2	0	0	0	0	1	
9.2.1.3		***Major Foundations***	**16**	**11**	**5**	**0**	**0**	**0**		
10	SM6195	Computer-Aided Design (CAD)	2	0	2	0	0	0	3	SM6050
11	SM6059	Tolerances and Measurement Techniques	2	2	0	0	0	0	3	
12	SM6153	Tolerances and Measurement Practice	1	0	1	0	0	0	3	
13	SM6022	Computer Applications in Industry	2	2	0	0	0	0	5	SC6208
14	SM6024	Engineering Economics	2	2	0	0	0	0	4	BS6040
15	SM6020	Industrial Computer Applications Practice	1	0	1	0	0	0	5	SC6208
16	SM6016	Work Design and Work Measurement	2	2	0	0	0	0	5	SM6017

17	SM6015	Work Measurement and Analysis Laboratory	1	0	1	0	0	0	6	SM6018
18	SE6247	Production Management	3	3	0	0			6	
9.2.2		**Specialization**	**23**	**18**	**2**	**1**	**2**	**0**		
9.2.2.1		**Compulsory**	**21**	**16**	**2**	**1**	**2**	**0**		
1	SM6147	Industrial Systems Modeling and Simulation Techniques	2	2	0	0	0	0	6	SM6023
2	SM6019	Industrial Systems Modeling and Simulation Practice	1	0	1	0	0	0	6	SM6023
3	SM6013	Product Quality Management	2	2	0	0	0	0	6	SM6018
4	SM6008	Systems Engineering	2	2	0	0	0	0	5	SM6024
5	SM6188	Industrial Facility Layout Design	3	2	0	1	0	0	6	SM6008
6	SM6189	Industrial Systems Design Course Project	2	0	0	0	2	0	7	SM6188
7	SM6006	Scheduling Techniques	2	2	0	0	0	0	7	SE6247
8	SM6007	Forecasting Techniques	2	2	0	0	0	0	6	SM6018
9	SM6010	Decision-Making Techniques	2	2	0	0	0	0	7	SM6007
11	SM6011	Production Data Analysis	1	0	1	0	0	0	7	SM6007
12	SM6014	Lean Manufacturing	2	2	0	0	0	0	7	SM6013
9.2.2.2	**TcHTCN**	**Elective Courses (select 2 credits)**	**2**	**2**	**0**	**0**	0	0	**7**	
13	SM6196	CNC Practice	2	0	2	0	0	0		
14	SM6182	Robotics Practice	2	0	2	0	0	0		
15	SM6005	Manufacturing Execution Systems (MES)	2	2	0	0	0	0		
16	SM6004	Smart Manufacturing Systems	2	2	0	0	0	0		
17	SM6028	Manufacturing Systems	2	2	0	0	0	0		

18	SM6012	Management Information Systems Analysis and Design	2	2	0	0	0	0		
19	SM6002	Maintenance Technology	2	2	0	0	0	0		
20	SM6128	Artificial Intelligence in Robotics	2	2	0	0	0	0		
21	SM6121	Actuators and Control	2	2	0	0	0	0		
22	SM6086	Product Design and Development	2	1	0	1	0	0		
23	SE6256	Materials and Inventory Management	2	2	0	0	0	0		
24	SE6241	Supply Chain Management	2	2	0	0	0	0		
25	SM6066	Production Process Automation	2	2	0	0	0	0		
9.2.3		**Free Electives**	**2**	**2**	**0**	**0**	**0**	**0**		
9.2.3.1		***Compulsory***	**2**	**2**	**0**	**0**	**0**	**0**		
	SE6209	Innovation and Entrepreneurial Thinking	**2**	**2**	**0**	**0**	**0**	**0**	**7**	
9.2.3.2		**Electives (select one of 5 foreign language program groups)**	0							
		Chinese Language Program								
	FL6560	*Basic Chinese 1.*	0						1	
	FL6561	*Basic Chinese 2*	0						2	FL6560
		Korean Language Program								
	FL6564	*Basic Korean 1*	0						1	
	FL6565	*Basic Korean 2*	0						2	FL6564
		Japanese Language Program								

	FL6562	*Basic Japanese 1*	0						1	
	FL6563	*Basic Japanese 2*	0						2	
		English Language Program								
	SL6311	*Basic English for Mechanical and Automotive Engineering 1*	0						1	
	SL6312	*Basic English for Mechanical and Automotive Engineering 2*	0						2	SL6311
		German Language Program								
	FL6580	*Basic German 1*	0						1	
	FL6581	*Basic German 2*	0						2	FL6580
9.2.4		**Industry Internship and Graduation Project/Thesis**	**15**	**0**	**0**	**0**	**8**	**7**		
1	SM6021	Industry Internship	7	0	0	0	0	7	8	SM6188
2	SM6003	Graduation Project	8	0	0	0	8	0	8	