Curriculum Framework for the Talented Master's Program in Mechatronics Engineering

No.	Course Code	Knowledge Area / Course Title	Total Credits	Credit Distribution			
				Theory	Prac./Lab	Essay / Assignment / Seminar / Project	Internship/Thesis
				(Theory)	(Practical / Lab)	Essay / Assignment / Seminar / Project (hours)	(Internship / Thesis)
6.1		**Part 1. General Knowledge**	**5**	**4**	**0**	**1**	**0**
1	LP7301	Philosophy	3	3	0	0	0
2	SM7071_TN	Scientific Research Methods	2	1	0	1	0
6.2		**Part 2. Core Disciplinary Knowledge**	**16**				
6.2.1		***Compulsory Courses***	***12***	***6***	***0***	***6***	***0***
1	SM7056_TN	Modern Control Theory	2	1	0	1	0
2	SM7057_TN	Advanced Sensors and Measurement Signal Processing	2	1	0	1	0
3	SM7058_TN	Multibody System Dynamics	2	1	0	1	0
4	SM7004_TN	Modeling and Simulation of Engineering Systems	2	1	0	1	0
5	SM7059_TN	Engineering Optimization	2	1	0	1	0
6	SM7038_TN	Cyber-Physical Systems (CPS)	2	1	0	1	0

6.2.2		***Elective Courses (Select at least 4 credits)***	***4***				
1	SM7060_TN	Microcontroller Technology and Applications	2	1	0	1	0
2	SM7061_TN	Digital Control Systems	2	1	0	1	0
3	SM7062_TN	Microelectromechanical Systems (MEMS)	2	1	0	1	0
4	SM7063_TN	Advanced Engineering Vibrations	2	1	0	1	0
5	SM7039_TN	Robot Operating System (ROS 2) Programming	2	1	1	0	0
6	SM7011_TN	Advanced Project Management	2	1	0	1	0
7	SM7064_TN	Special Topic in Measurement Systems	2	1	0	1	0
6.3		**Part 3. Specialized Knowledge**	**18**				
6.3.1		***Compulsory Courses***	***12***	***6***	***3***	***3***	***0***
1	SM7065_TN	Intelligent Control	2	1	0	1	0
2	SM7040_TN	Artificial Intelligence in Mechatronics	2	1	1	0	0
3	SM7042_TN	Engineering Data Analysis	2	1	1	0	0
4	SM7041_TN	Intelligent Human–Machine Interaction (HMI)	2	1	1	0	0
5	SM7043_TN	Digital Twins and System Maintenance	2	1	0	1	0
6	SM7006_TN	Innovation and Technology Management	2	1	0	1	0
6.3.2		***Elective Courses (Select at least 6 credits)***	***6***				
1	SM7066_TN	Robot Manipulator Dynamics and Control	2	2	0	0	0

2	SM7067_TN	Automatic Hydraulic and Pneumatic Control	2	1	0	1	0
3	SM7051_TN	Autonomous Robots and Intelligent Navigation	2	1	0	1	0
4	SM7009_TN	Advanced Robotic Systems	2	1	0	1	0
5	SM7068_TN	Embedded Systems	2	1	1	0	0
6	SM7044_TN	Advanced Computer Vision	2	1	1	0	0
7	SM7045_TN	Generative AI	2	1	1	0	0
8	SM7069_TN	Distributed Control Systems (DCS) in Industry	2	1	1	0	0
9	SM7021_TN	Digital Factory	2	1	0	1	0
10	SM7048_TN	3D Printing and Additive Manufacturing	2	1	1	0	0
11	SM7035_TN	Sustainable Energy Systems and Design	2	1.5	0	0.5	0
12	SM7070_TN	Special Topic in Manufacturing Systems	2	1	0	1	0
6.4		**Research Seminars, Project and Thesis**	**21**	**0**	**0**	**6**	**15**
1	SM7052_TN	Research Seminar 1	2	0	0	2	0
2	SM7053_TN	Research Seminar 2	2	0	0	2	0
3	SM7054_TN	Project	2	0	0	2	0
4	SM7055_TN	Master's Thesis	15	0	0	0	15
		Total	**60**				**15**