SCHOOL OF MECHANICAL ENGINEERING, CURRICULUM

Course #	Course name	Environment	Materials	Fluid Mechanics	Mechanics of Solids	Heat & Energy Transfer	Systems	Credits	Hours	Prerequisites	Semester
0510.7003	Scientific Writing in English							None	2+2	Personal instruction. Recommended for Research Track (with thesis)	1,2
0510.7312	Advanced topics in Linear Algebra with Applications to Dynamical systems						x	2	2	See School of Electrical Engineering	1
0540.6101	Flow in Porous Environments	x		x				3	3	See course description	*
0540.6201	Theory of Composite Materials				x			3	3	Introduction to Theory of Elasticity	2
0540.6301	Viscous Flow	x		x		x		3	3	Advanced Fluid Mechanics	*
0540.6302	Compressible Flow			x				3	3		*
0540.6304	Aircraft Aerodynamics			x				3	3	See course description	*
0540.6305	Introduction to Turbulent Flow	x		x		x		3	3	Fluid Mechanics 2	*
0540.6306	Water Wave Theory			x				3	3		2

0540.6308	Dynamical Systems and Chaos			x				3	3		*
0540.6309	Boundary Layers	x		x		x		3	3		*
0540.6311	Two-Phase Flow	x		x		x		3	3		*
0540.6312	Hydrodynamic Stability	x		x		x		3	3	Advanced Fluid Mechanics	*
0540.6313	Hydrodynamics of Watercraft (Introduction)			x				3	3	Fluid Mechanics 1	*
0540.6314	Experimental Engineering	x		x		x		2	3		*
0540.6315	Kinetic Theory of Gases	x				x		3	3	Thermodynamics 1	*
0540.6317	Hydrodynamics of Watercraft (motion of ship on waves))			x				3	3	Fluid Mechanics 1	*
0540.6320	Swimming and Flying in Nature			x		x		3	3	Fluid Mechanics 1 (based on supervisor's recommendation)	*
0540.6322	Flow Control of Boundary Layers			x		x		3	3	Fluid Mechanics 1 **or** Introduction to Aerodynamics **or** Advanced Fluid Mechanics and basic knowledge	1

										in MATLAB or Python	
0540.6330	Flow in Oil and Natural Gas Reservoirs	x		x				3	3	Fluid Mechanics 1 **or** Advanced Fluid Mechanics	*
0540.6340	Advanced Topics in Sea Waves: from Theory to Experiments	x		x						Fluid Mechanics 1; Basic Course in Sea Waves; basic programming/ science See course description	*
0540.6403	Experimental Mechanics				x			3	3	Mechanics of Solids 1&2	*
0540.6405	Theory of Tables and Shells				x			3	3	Introduction to Theory of Elasticity; Differential and Integral Equations	*
0540.6406	Theory of Plasticity				x					Introduction to Theory of Elasticity	*
0540.6407	Fracture Mechanics				x			3	3	Introduction to Theory of Elasticity	2
0540.6408	Finite Element Analysis 1				x			3	3	Introduction to Finite Elements	2
0540.6409	Fractures & Fatigue				x			3	3	Fracture Mechanics;	*

										Introduction to Theory of Elasticity	
0540.6410	Structural Dynamics				x			3	3	Theory of Vibration	1
0540.6411	Finite Element Analysis 2				x			3	3	Finite Element Analysis 1	1
0540.6412	Optimization in Structural Design				x			3	3	Theory of Structures	*
0540.6413	Continuum Mechanics			x	x			3	3	Mechanics of Solids; Fluid Mechanics 1	*
0540.6414	Waves in Solids and Structures				x			3	3	Introduction to Theory of Elasticity	*
0540.6415	Advanced Topics in Mechanical Engineering				x			3	3		*
0540.6417	Introduction to the Mechanics of Solids with Microstructure				x			3	3		*
0540.6420	Nonlinear Mechanics of Composite Materials and Structures							3	3	Continuum Mechanics; Theory of Composite Materials or	*

										lecturer's approval	
0540.6430	Statistical Mechanics of Grainy Materials							3	3		2
0540.6440	Mechanics of Failure of Materials and Materials with Internal Structure	x	x		x			3	3	Mechanics of Solids; Introduction to Theory of Elasticity	*
0540.6445	Biomechanics of Bones and Arteries		x		x			3	3	Mechanics of Solids 1	1
0540.6450	Introduction to Optomechanical Engineering						x	3	3	Physics 2; Mechanics of Solids 1; Fluid Mechanics 1	2
0540.6501	Heat Transfer - Convection			x		x		3	3	Heat Transfer - Conduction	2
0540.6502	Heat Transfer - Radiation					x		3	3		1
0540.6605	Mechanics of Robotic Arms						x	3	3	Robot Mechanics & Control	*
0540.6606	Design & Modeling of MEMS (Micro Electro-						x	3	3	Introduction to Theory of Elasticity; Mechanics of Solids 1 & 2	*

	Mechanical Systems)										
0540.6610	Multi-Objective Optimization[1]						x	3	3		1
0540.6700	Oil and Gas Reservoirs - Fundamentals of Production[2]	x		x		x		3	3	Fluid Mechanics 1 **or** Advanced Fluid Mechanics	2
0542.4121	Separation Processes in Environmental Engineering	x						4	3	Equivalent level	1
0542.4122	Contaminant Transport in the Environment	x		x		x		4	3	Equivalent level	*
0542.4123	Heat & Material Transfer Processes	x		x		x		4	3	Equivalent level	2
0542.4166	Analytical Mechanics			x	x			4	3	Equivalent level	1
0542.4222	Theory of Structures		x		x		x	4	3	Equivalent level	*
0542.4351	Marine Engineering							4	3	Equivalent level	1
0542.4391	Laboratory in Numerical	x				x		5	3	Equivalent level	1

	Simulation of Flow & Heat Transfer										
0542.4422	Engineering Design: Foundation and Methods							4	3	Equivalent level	1
0542.4455	Computational Intelligence						x	4	3	Equivalent level	2
0542.4622	Process Dynamics and Control							3	2	Equivalent level	2
0542.4656	Autonomous Robots Control						x	4	3	Equivalent level	*
0545.5101	Air Pollution	x						3	3	See Environmental Engineering Program	*
0545.5110	Solar Energy	x				x		3	3	See Environmental Engineering Program	*
0545.5126	Energy Conversion	x				x		3	3		*
0545.5303	Assessment of Radiation Hazards and Radiation Safety	x				x		3	3	See Environmental Engineering Program	2

0553.7000	Practical Ethics for STEM Students							3	3	See Department of Biomedical Engineering	2
0581.5212	Composite Structures and Functions							3	3	See Material Science & Engineering Program	1

* The course is not offered in the 2018-2019 academic year.

[1] The course is taught in the English language.

[2] Concentrated course