GRADUATE COURSES

Curriculum for Master and Ph.D. degrees in Mechanical Engineering: *Energy Conversion*

Course Code	*Course Title*	*Credit*	
15-10-700	Advanced Engineering Math II	3	Group 1***
15-10-705	Tensor Analysis	3	
15-10-500	Advanced Engineering Math I*	3	
15-10-505	Continuum Mechanics I*	3	
15-14-502	Advanced Fluid Mechanics	3	Group 2***
15-14-658	Boundary Layers	3	
15-14-702	Heat Transfer (Conduction)	3	Group 3***
15-14-654	Heat Transfer (Convection)	3	
15-14-656	Heat Transfer (Radiation)	3	
15-14-516	CFD I	3	
15-14-668	CFD II	3	
15-14-650	Advanced Gas Dynamics	3	
15-14-504	Statistical Thermodynamics	3	
15-14-700	Hydro- & Aero-Dynamics	3	
15-14-852	Turbulence	3	
15-14-854	Advanced Gas Turbines	3	
15-14-858	Viscous Flow	3	
15-14-708	Advanced Thermodynamics	3	
15-14-662	Advanced Combustion	3	
15-14-601	Numerical Methods	3	
15-14-706	Two-Phase Flow & Heat Transfer	3	
15-14-856	Advanced Turbomachinery	3	
15-14-710	Micro and Nano Flows	3	
15-14-714	Parallel Processing	3	
	Selected Topics in Mech. Eng.	3	
	Special Topics in Mech. Eng.	3	
90-10-503-15	Seminar*	2	
90-10-606-01	Thesis*	6	
	Dissertation**	18	

* required for master students.
** required for PhD students.
*** One course from each group is required for PhD students. Two courses from group 2 and group 3 is required for master students.

Curriculum for Master and Ph.D. degrees in Mechanical Engineering: *Applied Design*

Course Code	*Course Title*	*Credit*	
	Advanced Engineering Math II	3	Group 1***
	Continuum Mechanics II	3	
15-10-500	Advanced Engineering Math I*	3	
15-10-505	Continuum Mechanics I*	3	
15-12-501	Advanced Dynamics	3	Group 2***
15-12-503	Advanced Vibrations	3	
15-12-509	Advanced Control	3	
15-12-603	Elasticity	3	Group 3***
15-12-605	Plasticity	3	
15-12-607	FEM In Solid Mechanics I	3	
15-12-545	Advanced Computer Aided Design	3	
15-12-601	Numerical Methods	3	
15-12-507	Metal Forming	3	
15-12-701	Nonlinear Elasticity	3	
15-12-651	Mechanics of Robotic Systems	3	
15-12-653	Theory of Plates and Shells	3	
15-12-707	Nonlinear Systems	3	
15-12-709	Nonlinear Vibrations	3	
15-10-549	Advanced Hydraulics & Pneumatics	3	
15-12-657	Optimization	3	
15-12-511	Elastic Stability	3	
15-12-713	Fracture Mechanics	3	
15-12-513	Control of Robotic Systems	3	
15-12-851	Time-variant Systems	3	
15-12-749	Mechanics of Robotic Systems II	3	
15-12-721	Advanced Plasticity II	3	
15-12-547	Modal Analysis	3	
15-12-703	FEM In Solid Mechanics II	3	
	Selected Topics in Mech. Eng.	3	
	Special Topics in Mech. Eng.	3	
90-10-503-15	Seminar*	2	
90-10-606-01	Thesis*	6	
	Dissertation**	18	

* required for master students.
** required for PhD students.
*** One course from each group is required for PhD students. Two courses from group 2 and group 3 is required for master students.

Curriculum for Master and Ph.D. degrees in Mechanical Engineering: *Manufacturing*

Course Code	*Course Title*	*Credit*	
	Advanced Engineering Math II**	3	
15-10-505	Continuum Mechanics I**	3	
15-16-517	Applied Math I*	3	
15-16-530	Advanced CNC machines	3	
15-12-667	Metal Forming	3	Group 1***
15-12-607	FEM In Solid Mechanics I	3	
15-12-719	Advanced Die Design	3	
15-16-670	Machining and Cutting Tools	3	Group 2***
15-16-680	Electrophysical Phenomena	3	
15-16-673	Automation	3	Group 3***
14-16-540	Industrial Production Systems	3	
15-12-651	Mechanics of Robotic Systems	3	
15-16-650	Metallurgy in Manufacturing	3	
503-12-15	Advanced Vibrations	3	
601-12-15	Numerical Methods	3	
15-16-520	Design of Elements & Structure of Machine Tools	3	
15-10-549	Advanced Hydraulics & Pneumatics	3	
510-10-15	Advanced Composite Materials	3	
15-10-640	Industrial Metals	3	
15-16-660	Welding	3	
15-16-667	Advanced Metrology	3	
	Selected Topics in Mech. Eng.	3	
	Special Topics in Mech. Eng.	3	
90-10-503-15	Seminar*	2	
90-10-606-01	Thesis*	6	
	Dissertation**	18	

* required for master students.
** required for PhD students.
*** One course from each group is required for master students.