

Program Planning Worksheet
Mechanical Engineering (Co-op)
 2019-2020 Academic Year

	FALL /2		WINTER /4		SUMMER /1	
YEAR 1	ENGR 213 (3.00) Applied Ord. Differential Eq.		ENCS 282* (3.00) Tech. Writing & Comm.		ENGR 201 (1.50) Professional Practice & Resp.	
	ENGR 242 (3.00) Statics		ENGR 233 (3.00) Applied Advanced Calculus		ENGR 202 (1.50) Sust. Dev. Enviro. Stewardship	
	MECH 211 (3.50) Mech. Engineering Drawing		ENGR 243 (3.00) Dynamics		ENGR 251 (3.00) Thermodynamics I	
	MECH 215 (3.50) Prog. for Mech & Indu Eng.		ENGR 244 (3.75) Mechanics of Materials		ENGR 311 (3.00) Trans. Cal. & Partial Diff. Eq.	
	MECH 221 (3.00) Materials Science		MECH 313 (3.50) Machine Drawing and Design		MECH 370 (3.50) Modelling, Simulation, Ctrl Sys.	
YEAR 2	WORK TERM 1 (You <u>must</u> complete ENCS 282 before your first work-term)		MECH 321 (3.50) Properties & Failure of Material		ENGR 301 (3.00) Engr. Manage. Principles Econ	
			MECH 343 (3.50) Theory of Machines		ENGR 361 (3.00) Fluid Mechanics I	
			MECH 351 (3.50) Thermodynamics II		ENGR 371 (3.00) Probability & Stats in Eng.	
			MECH 368 (3.50) Electronics for Mech. Engineers		ENGR 391 (3.00) Numerical Methods in Eng.	
			General Studies (3.00) (Ugrad Calendar, Sec. 71.110)		MECH 311 (3.75) Manufacturing Processes	
YEAR 3	MECH 344 (3.00) Machine Element Design		WORK TERM 2		WORK TERM 3	
	MECH 352 (3.50) Heat Transfer I					
	MECH 361 (3.50) Fluid Mechanics II					
	MECH 371 (3.75) Analysis & Design Ctrl Sys.					
	MECH 390 (3.00) Mech Engr. Design Project					
YEAR 4	MECH 375 (3.50) Mechanical Vibrations		ENGR 392 (3.00) Impact of Technology on Society			
	Technical Electives (as required†) (Ugrad Calendar, Sec. 71.40.1)					
	MECH 490‡ (4.00) Capstone Mechanical Engineering Design Project					
NOTES	* The Engineering Writing Test (EWT) or ENCS 272 must be <u>completed</u> prior to registering for ENCS 282 † 15.75cr if you took MECH 313 at 3.00cr, 15.25cr if you took MECH 313 at 3.50cr ‡ Capstone is a full year course, beginning in September. Registration is available as of June 1 st only					

Co-op students must follow the above sequence and are required to remain full-time in all study-terms. The only exception is that you may take an evening course during a work-term if it does not interfere with your employment. Suggested Work-Term courses are ENGR 301, 361, 392 or General Studies.

Please speak to your advisor or Co-op before making any changes. Sequence modification(s) must be submitted for approval by the Undergraduate Program Director or Assistant on the "Co-op Sequencing Form" available from the Co-Op office (GM-430).

GPA assessment and academic standing

An assessment of your academic standing is done once a year after winter grades have been submitted. If you attempted at least 12 credits over an academic year – this includes the Summer, Fall, and Winter terms – your last annual GPA is calculated based on the number of courses you took and the grades achieved. If fewer than 12 credits were attempted in an academic year, no assessment will take place. In this case, credits will be forwarded to the next assessment when you accumulate the required number of credits. Acceptable GPA is at least a 2.00 - you may continue in your studies. Conditional GPA is between 1.50-1.99 - you need to meet with your department advisor prior to registration (some departments may have other conditions). Failed GPA is below 1.50 for the first time or below a 2.00 after a prior Conditional Standing assessment or after being readmitted from Failed standing (second level failed standing).

DETAILED COURSE INFORMATION
Mechanical Engineering 2019-20

COURSE	TITLE	CREDIT	PRE-REQUISITE	CO-REQUISITE	SUM 1	SUM 2	FALL	WIN
AERO 417	Standards, Regulations and Certification	3.00	ENGR 201		X		X	
AERO 431	Principles of Aeroelasticity	3.00	ENGR 243, 311				X	
AERO 455	Computational Fluid Dynamics for Aerospace Applications	3.75	ENGR 311, 391; MECH 361					X
AERO 462	Turbomachinery and Propulsion	3.00	MECH 351, 361				X	
AERO 464	Aerodynamics	3.00	MECH 361				X	X
AERO 465	Gas Turbine Design	3.50	AERO 462					X
AERO 480	Flight Control Systems	3.50	AERO 371 or ELEC 372 or MECH 371 or SOEN 385				X	
AERO 482	Avionic Navigation Systems	3.00	ENGR 371 or COMP 233; AERO 371 or ELEC 372 or MECH 370 or SOEN 385				X	
AERO 485	Introduction to Space Systems	3.00	MECH 351, 361					X
AERO 486	Aircraft Stress Analysis	3.00	ENGR 243, 244				X	
AERO 487	Design of Aircraft Structures	3.00	AERO 486					X
ENCS 282	Technical Writing and Communication	3.00	Engineering Writing Test (EWT), or ENCS 272 (min. C-)		X	X	X	X
ENGR 201	Professional Practice and Responsibility	1.50			X	X	X	X
ENGR 202	Sustainable Development and Environmental Stewardship	1.50			X		X	X
ENGR 213	Applied Ordinary Differential Equations	3.00	MATH 205	MATH 204	X		X	X
ENGR 233	Applied Advanced Calculus	3.00	MATH 204, 205		X		X	X
ENGR 242	Statics	3.00	MATH 204; PHYS 204	ENGR 213	X		X	X
ENGR 243	Dynamics	3.00	ENGR 213, 242		X		X	X
ENGR 244	Mechanics of Materials	3.75	ENGR 213 ; ENGR 242 or 245	ENGR 233	X	X		X
ENGR 245	Mechanical Analysis	3.00	PHYS 204	ENGR 213				X
ENGR 251	Thermodynamics I	3.00	MATH 203				X	X
ENGR 301	Engineering Management Principles and Economics	3.00			X	X	X	X
ENGR 311	Transform Calculus and Partial Differential Equations	3.00	ENGR 213, 233		X	X	X	
ENGR 361	Fluid Mechanics I	3.00	ENGR 213, 233, 251		X		X	X
ENGR 371	Probability and Statistics in Engineering	3.00	ENGR 213, 233			X	X	X
ENGR 391	Numerical Methods in Engineering	3.00	ENGR 213, 233; COMP 248 or COEN 243 or MECH 215 or BCEE 231		X	X	X	X
ENGR 392	Impact of Technology on Society	3.00	ENCS 282; ENGR 201, 202		X	X	X	X
ENGR 411	Special Technical Report	1.00	ENCS 282; permission of the Department		X		X	X
ENGR 412	Honours Research Project	3.00	ENCS 282; 75cr in the program; min. CGPA 3.00; Dept. permission		X		X	X
INDU 372	Quality Control and Reliability	3.00	ENGR 371					X
INDU 411	Computer Integrated Manufacturing	3.50	MECH 311					X
INDU 440	Product Design and Development	3.00	MECH 311					X
MECH 211	Mechanical Engineering Drawing	3.50			X		X	X
MECH 215	Programming for Mechanical and Industrial Engineers	3.50	MATH 204		X		X	X
MECH 221	Materials Science	3.00	CHEM 205				X	X
MECH 311	Manufacturing Processes	3.75	MECH 313		X		X	
MECH 313	Machine Drawing and Design	3.50	MECH 211				X	
MECH 321	Properties and Failure of Materials	3.50	MECH 221					X
MECH 343	Theory of Machines	3.50	ENGR 213, 233, 243				X	X
MECH 344	Machine Element Design	3.00	ENGR 244; MECH 313	MECH 321, 343			X	X
MECH 351	Thermodynamics II	3.50	ENGR 251				X	X
MECH 352	Heat Transfer I	3.50	ENGR 311, 361				X	X
MECH 361	Fluid Mechanics II	3.50	ENGR 361				X	X
MECH 368	Electronics for Mechanical Engineers	3.50	PHYS 205	ENGR 311			X	X
MECH 370	Modelling and Analysis of Dynamic Systems	3.50	PHYS 205; ENGR 213; ENGR 245 or 243	ENGR 311		X	X	X
MECH 371	Analysis and Design of Control Systems	3.75	ENGR 311; MECH 370				X	X
MECH 375	Mechanical Vibrations	3.50	AERO 371 or MECH 370		X		X	X
MECH 390	Mechanical Engineering Design Project	3.00	ENCS 282, MECH 311 , 343	MECH 344			X	X
MECH 411	Instrumentation and Measurements	3.50	ENGR 311; AERO 371 or MECH 370				X	
MECH 412	Computer-Aided Mechanical Design	3.50	MECH 313				X	
MECH 414	Computer Numerically Controlled Machining	3.50	MECH 311, 412					X
MECH 415	Advanced Programming for Mechanical and Industrial Engineers	3.00	MECH 215				X	
MECH 421	Mechanical Shaping of Metals and Plastics	3.50	MECH 221					X
MECH 422	Mechanical Behaviour of Polymer Composite Materials	3.00	ENGR 233, 244; MECH 221				X	
MECH 423	Casting, Welding, Heat Treating and Non-Destructive Testing	3.50	MECH 221				X	
MECH 424	MEMS – Design and Fabrication	3.50	MECH 311, 343					X
MECH 425	Manufacturing of Composites	3.50	MECH 311				X	
MECH 426	Stress and Failure Analysis of Machinery	3.00	ENGR 233, 244; MECH 321					X
MECH 444	Guided Vehicle Systems	3.00	MECH 375		N/A	N/A	N/A	N/A
MECH 447	Fundamentals of Vehicle System Design	3.50	MECH 343				X	
MECH 448	Vehicle Dynamics	3.00		MECH 447				X
MECH 452	Heat Transfer II	3.50	MECH 351, 352, 361					X
MECH 453	Heating, Ventilation and Air Conditioning Systems	3.00	MECH 352					X
MECH 454	Vehicular Internal Combustion Engines	3.00	MECH 351, 361					X
MECH 460	Finite Element Analysis	3.75	ENGR 244, 391					X
MECH 461	Gas Dynamics	3.50	MECH 361			X		
MECH 462	Wind Turbine Engineering	3.00	MECH 343, 361	MECH 344, 371			X	X
MECH 463	Fluid Power Control	3.50	ENGR 261; ELEC 372 or MECH 371					
MECH 471	Microcontrollers for Mechatronics	3.50	ENGR 311; MECH 368					X
MECH 472	Mechatronics and Automation	3.50	MECH 215	MECH 371				X
MECH 473	Control System Design	3.50	ELEC 372 or MECH 371				X	
MECH 474	Mechatronics	3.75	ELEC 372 or MECH 371					X
MECH 476	Generative Design and Manufacturing in Engineering	3.00	MECH 313	AERO 390 or MECH 390	N/A	N/A	N/A	N/A
MECH 490	Capstone Mechanical Engineering Design Project	4.00	ENCS 282; ENGR 301; MECH 344, 390				X	X
MECH 498	Topics in Mechanical Engineering	3.00			N/A	N/A	N/A	N/A

Note: In the case of discrepancies between this and the current Undergraduate Calendar, please contact your Undergraduate Program Assistant for clarification.