



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

	FALL /2	WINTER /4	SUMMER /1
YEAR 1	ENGR 213 (3.00) Applied Ord. Differential Eq.	ACCO 220 (3.00) Financial & Managerial Acco.	ENGR 202 (1.50) Sust. Dev. Enviro. Stewardship
	INDU 211 (3.00) Intro Prod & Manufacturing Sys.	ENCS 282* (3.00) Tech. Writing & Communication	ENGR 233 (3.00) Applied Advanced Calculus
	MECH 211 (3.50) Mech. Engineering Drawing	ENGR 201 (1.50) Professional Practice & Resp.	ENGR 371 (3.00) Probability & Stats in Eng.
	MECH 215 (3.50) Prog. for Mech & Indu Eng.	ENGR 245 (3.00) Mechanical Analysis	MECH 311 (3.75) Manufacturing Processes
	MECH 221 (3.00) Materials Science	ENGR 251 (3.00) Thermodynamics I	Basic & Natural Science (3.00) (Ugrad Calendar 71.40.2)
		MECH 313 (3.50) Machine Drawing and Design	
YEAR 2	WORK TERM 1 (You <u>must</u> complete ENCS 282 before your first work-term)		ENGR 301 (3.00) Engr. Manage. Principles Econ
			ENGR 311 (3.00) Trans. Cal. & Partial Diff. Eq.
			ENGR 391 (3.00) Numerical Methods in Eng.
			ENGR 392 (3.00) Impact of Tech. on Society
			INDU 323 (3.50) Operations Research I
		INDU 371 (3.00) Stochastic Models in Indu. Engr	
		INDU 372 (3.00) Quality Control and Reliability	
		INDU 411 (3.50) Comp. Integrated Manufac.	
		Technical Elective† (Ugrad Calendar 71.40.2)	
YEAR 3	INDU 311 (3.50) Simulation of Industrial Systems	WORK TERM 2	
	INDU 320 (3.00) Production Engineering		
	INDU 324 (3.50) Operations Research II		
	INDU 330 (3.00) Engineering Management		
	INDU 412 (3.50) Human Factors Engineering		
YEAR 4	INDU 421 (3.50) Facilities & Material Handling	INDU 321 (3.00) Lean Manufacturing	WORK TERM 3
	INDU 423 (3.50) Inventory Control	INDU 342 (3.00) Logistics Network Models	
	Technical Electives (as required†) (Ugrad Calendar, Sec. 71.40.1)		
	INDU 490‡ (4.00) Capstone Industrial Engineering Design Project		
NOTES	* The Engineering Writing Test (EWT) or ENCS 272 must be <u>completed</u> prior to registering for ENCS 282 † Due to numerous changes over the years, please verify your advisement report for your exact requirements. ‡ 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 ACCO 220, ENGR 301, 392 or a Technical Elective 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
Industrial Engineering 2019-20

COURSE	TITLE	CREDIT	PRE-REQUISITE	CO-REQUISITE	SUM 1	SUM 2	FALL	WIN
ACCO 220	Financial and Managerial Accounting	3.00						X
BSTA 478	Data Mining Techniques	3.00	Permission from JMSB				X	X
BTM 430	Enterprise Resource Planning & Information Technology Integration	3.00	Permission from JMSB		X		X	X
BTM 480	Project Management	3.00	Permission from JMSB				X	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 245	Mechanical Analysis	3.00	PHYS 204	ENGR 213				X
ENGR 251	Thermodynamics I	3.00	MATH 203			X	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 211	Introduction to Production and Manufacturing Systems	3.00					X	
INDU 311	Simulation of Industrial Systems	3.50	ENGR 371				X	
INDU 320	Production Engineering	3.00	INDU 323		X		X	
INDU 321	Lean Manufacturing	3.00	INDU 320					X
INDU 323	Operations Research I	3.50	ENGR 213, 233; INDU 211		X			X
INDU 324	Operations Research II	3.50	INDU 323				X	
INDU 330	Engineering Management	3.00	ENCS 282	ENGR 301			X	
INDU 342	Logistics Network Models	3.00	INDU 324					X
INDU 371	Stochastic Models in Industrial Engineering	3.00	ENGR 371					X
INDU 372	Quality Control and Reliability	3.00	ENGR 371					X
INDU 410	Safety Engineering	3.00	MECH 311				X	
INDU 411	Computer Integrated Manufacturing	3.50	MECH 311					X
INDU 412	Human Factors Engineering	3.50	ENGR 371				X	
INDU 421	Facilities Design and Material Handling Systems	3.50	INDU 320	INDU 311			X	
INDU 423	Inventory Control	3.50	INDU 320				X	
INDU 440	Product Design and Development	3.00	MECH 311					X
INDU 441	Introduction to Six Sigma	3.00	INDU 372			X		X
INDU 466	Decision Models in Service Sector	3.00	ENGR 371; INDU 320					X
INDU 475	Advanced Concepts in Quality Improvement	3.00	INDU 372				X	
INDU 480	Cases in Industrial Engineering	3.00	INDU 311, 324					X
INDU 490	Capstone Industrial Engineering Design Project	4.00	75 credits in the program; ENCS 282; ENGR 301	INDU 421			X	X
INDU 498	Topics in Industrial Engineering	3.00			N/A	N/A	N/A	N/A
MANA 300	Entrepreneurship: Launching Your Business	3.00	Permission from JMSB				X	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	X
MECH 321	Properties and Failure of Materials	3.50	MECH 221					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 412	Computer-Aided Mechanical Design	3.50	MECH 313				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 423	Casting, Welding, Heat Treating and Non-Destructive Testing	3.50	MECH 221				X	
MECH 425	Manufacturing of Composites	3.50	MECH 311				X	

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