MAJOR: INDUSTRIAL ENGINEERING, B.S.
INTERNATIONAL ENGINEERING PROGRAM

Industrial engineers are proficient in the design, improvement, and management of complex systems of people, materials, equipment, and energy. They study and adapt product designs and the associated plant facilities to optimize production, while considering economic, technical, and human factors. The educational objectives of the industrial engineering program are to produce graduates who are able to: 1. Solve industrial engineering problems by applying contemporary engineering tools to propose and implement effective solutions. 2. Design, develop, implement, and improve integrated systems that include people, materials, information, equipment, and energy. 3. Contribute as informed, ethical, and responsible members of the engineering profession and society as a whole. 4. Continue lifelong professional development throughout their career. 5. Collaborate and communicate effectively with others as a member or leader of an engineering or multidisciplinary team in an international setting.

TYPICAL PROGRAM OF STUDY			
FIRST YEAR			
FALL SEMESTER		SPRING SEMESTER	
WRIT 1120 College Writing	3 cr	CHEM 1151 General Chemistry I	5 cr
CS programming course[1]	3-5	IE 1225 Intro to Design and Manufacturing Engineering[3]	4 cr
MATH 1296 Calculus I^		MATH 1297 Calculus II	
or MATH 1596 Honors Calculus I	5 cr	or MATH 1597 Honors Calculus II	5 cr
Liberal education requirement[2]	3 cr	PHYS 2011 General Physics I	4 cr
Total:	14-16cr	Total:	18 cr
SECOND YEAR			
ENGR 2015 Statics	3 cr	ENGR 2016 Mechanics of Materials	3 cr
ENGR 2110 Intro to Material Science for Engineers	3 cr	ENGR 2026 Dynamics	3 cr
MATH 3280 Differential Equations w/Linear Algebra	4 cr	ECE 2006 Electrical Circuit Analysis	4 cr
PHYS 2012 General Physics II	4 cr	STAT 3411 Engineering Statistics	3 cr
ECON 1022 Principles of Economics: Macro		Liberal Education requirement[2]	3-4 cr
or ECON 1023 Principles of Economics: Macro	3 cr	Total:	16-17cr
Total:	17 cr		
THIRD YEAR			
IE 3115 Operations Research	4 cr	WRIT 3130 Advanced Writing: Engineering[4]	3 cr
IE 3122 Materials Engineering lab	2 cr	IE 3222 Occupational Systems lab	2 cr
IE 3125 Engineering Economic Analysis	3 cr	IE 4010 Six Sigma Quality Control	3 cr
IE 3130 Materials Processing Engineering	3 cr	IE 4020 Lean Enterprises Management	3 cr
IE 3140 Human Factors & Ergonomic Design	3 cr	ME 4145 CAD/CAM	4 cr
Total:	15 cr	Liberal education[2]	3 cr
		Total:	18 cr
FOURTH YEAR			
IE 4801 International Engineering Report[5]	1 cr	IE 4801 International Engineering Report[5]	1 cr
IE 4803 Simulation of Swedish Manufacturing	3 cr	IE 4812 Computer Integrated Manufacturing	4 cr
IE 4827 Manufacturing Systems Project	8 cr	IE 4823 Project Mgmt & Swedish Industrial Design	6 cr
INTS 1070 Intro to Scandinavia	3 cr	IE 4870 Advanced Manufacturing processes	4 cr
Total:	15 cr	Total:	15cr

^First math course is determined by math placement exam. This schedule presupposes placement into Math 1296.

[1] Students must choose one computer programming course from the following: CS 1121, CS 1131, CS 1511 or CS 2121.

[2] In addition to the above listed requirements, students must complete one course *each* from liberal education categories 7 and 9, and one additional course from *either* 9 or 10. Courses from categories 9 and 10 must have different course designators.

[3] Students may take both ENGR 1210 and IE 2222 in place of IE 1225.

[4] Students may take WRIT 3150 or WRIT 3180 in place of WRIT 3130

[5] Students must take IE 4801 twice.

For additional information: Department of Mechanical & Industrial Engineering ▪ 105 Voss-Kovach Hall
218-726-6161 ▪ mie@d.umn.edu ▪ http://www.d.umn.edu/mie

INDUSTRIAL ENGINEERING, B.S.
INTERNATIONAL ENGINEERING PROGRAM

MAJOR COURSE REQUIREMENTS	CREDITS	PREREQUISITES	SEMESTER TO BE COMPLETED	GRADE
FIRST YEAR				
WRIT 1120 College Writing	3			
CHEM 1151 General Chemistry I	5	HS chemistry, HS algebra		
CS programming course[1]	3-5			
IE 1225 Intro to Design and Manufacturing Engineer.[3]	4	MATH 1296 or 1596		
MATH 1296 Calculus I^	5	Math placement or MATH 1250 Placement		
or MATH 1596 Honors Calculus I				
MATH 1297 Calculus II	5	MATH 1290, 1296 or 1596 with C- or better		
or MATH 1597 Honors Calculus II		MATH 1596		
PHYS 2011 General Physics I	4	MATH 1296 or 1596		
Liberal education requirement[2]	3			
SECOND YEAR				
ECE 2006 Electrical Circuit Analysis	4	PHYS 2011, MATH 3280 (concurrent reg. OK)		
ECON 1022 Principles of Economics: Macro		15 credits or department consent		
or ECON 1023 Principles of Economics: Macro	3	15 credits or department consent		
ENGR 2015 Statics	3	MATH 1297, PHYS 2011		
ENGR 2110 Intro to Material Science for Engineers	3	CHEM 1151, ENGR 2015 (concurrent reg. OK)		
ENGR 2016 Mechanics of Materials	3	ENGR 2015, MATH 3280 (concurrent reg. OK)		
ENGR 2026 Dynamics	3	ENGR 2015, MATH 3280 (concurrent reg. OK)		
MATH 3280 Differential Equations w/Linear Algebra	4	MATH 1297 with a C- or better		
PHYS 2012 General Physics II	4	MATH 1297, PHYS 2012		
STAT 3411 Engineering Statistics	3	MATH 1297		
Liberal Education requirement[2]	3-4			
THIRD YEAR				
WRIT 3130 Advanced Writing: Engineering[4]	3	WRIT 1120, 60 credits		
IE 3115 Operations Research	4	MATH 3280, STAT 3411		
IE 3122 Materials Engineering lab	2	IE 2222		
IE 3125 Engineering Economic Analysis	3	BSIE or BMSE major, STAT 3411(concurrent OK)		
IE 3130 Materials Processing Engineering	3	ENGR 2110, 2016, STAT3411		
IE 3140 Human Factors & Ergonomic Design	3	ENGR 2026		
IE 3222 Occupational Systems lab	2	IE 3122, 3140, 4020 (concurrent reg. OK)		
IE 4010 Six Sigma Quality Control	3	STAT 3411		
IE 4020 Lean Enterprises Management	3	IE 2222		
ME 4245 CAD/CAM	4	ENGR 2016, BSIE Intl Eng, or BSME candidate		
Liberal education[2]	3			
FOURTH YEAR				
IE 4801 International Engineering Report[5]	1	BSIE or BSME candidate, department consent		
IE 4801 International Engineering Report[5]	1	BSIE or BSME candidate, department consent		
IE 4803 Simulation of Swedish Manufacturing	3	BSIE or BSME candidate		
IE 4812 Computer Integrated Manufacturing	4	BSIE or BSME candidate		
IE 4823 Project Mgmt & Swedish Industrial Design	6	BSIE or BSME candidate		
IE 4827 Manufacturing Systems Project	8	BSIE or BSME candidate		
IE 4870 Advanced Manufacturing processes	4	BSIE or BSME candidate		
INTS 1070 Intro to Scandinavia	3			

^First math course is determined by math placement exam. This schedule presupposes placement into Math 1296.

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