

**University of North Dakota
Department of Mechanical Engineering
Curriculum 2017-2018**

FRESHMAN YEAR

			Credits				Credits	
MATH	165°	Calculus I	4		MATH	166°	Calculus II	4
CHEM	121°	Gen Chem I & Lab	4		PHYS	251°	Univ Phys I & Lab	4
ENGL	110°	College Comp I	3		ENGR	200°	Comp App in Eng	2
ME	101+°	Intro to Mech Eng	3		ENGL	130°	Writing for Public Aud	3
		Arts & Humanities	3				Arts and Humanities	3
			17					16

SOPHOMORE YEAR

			Credits				Credits	
MATH	265°	Calculus III	4		MATH	266	Elem Diff Equations	3
PHYS	252°	Univ Phys II & Lab	4		ENGR	206	Fundamentals of Elec Engr	3
ENGR	201°	Statics	3		ENGR	202°	Dynamics	3
ME	201°	Student Design	2		ENGR	203°	Mech of Materials	3
ME	341°	Thermodynamics	3				Lab Science	4
			16					16

JUNIOR YEAR

			Credits				Credits	
ME	301	Material Science	3		ME	323+	Mach Comp Des & Lab	4
ME	306	Fluid Mechanics	3		ME	418	Manuf Proc & Lab	4
ME	322	Design of Mach	3		ME	474	Heat and Mass Trans	3
ENGR	460	Engr Economy	3		MATH	321	Applied Statistical Meth ^π	3
		Technical Elective	3				Technical Elective	3
			15					17

SENIOR YEAR

			Credits				Credits	
ME	480	Mech Eng Seminar	3		ME	488+	Eng Design	3
ME	483	Mech Meas Lab	3				Prof Eng Ethics*	3
ME	487+	Eng Design	2				Soc Sci or Arts & Hum**	3
		Social Science	3				Technical Elective	3
		Technical Elective	3				Technical Elective	3
		Technical Elective	3					
			17					15

+ This course involves the design and fabrication of an engineering prototype

° This course must be completed with a grade of 'C' or better

! PHYS 253/L or CHEM 122/L unless an alternate course is approved by the ME Department

¥ One Technical Elective can be taken from other engineering departments, Math or Physics

*Can be ME 370, ChE 340 or PHIL 250

**Choose a Social Science if taking PHIL 250 (formerly PHIL 370), an Arts & Humanities if taking ME 370 or ChE 340

π Another Calculus-based statistics course can be substituted for MATH 321

TECHNICAL ELECTIVES AND OPTIONAL CONCENTRATIONS

One technical elective must be taken from each stem unless the student is pursuing the Aerospace Concentration (see below). Students may receive an *optional* concentration, documented on the transcript, in one of the listed stems as indicated. Students who satisfactorily complete two Cooperative Education (ME 397) experiences for a combined total of at least 3 credit hours are granted a waiver for one technical elective, provided one of the Cooperative Education experiences lasts for the duration of either a fall or spring semester. The waived technical elective is considered as elective at large and is not specified into any one of the three groups listed below.

I. Mechanical Design Stem:

ME 424#	Systems, Dynamics and Controls	(3)
ME 426#	Mechanical Vibrations	(3)
ME 429#	Intro. to Finite Element Analysis	(3)
ME 439	Introduction to Robotics	(3)
ME 484	Ground Vehicle Dynamics	(3)
ME 485	Multiphysics Modeling	(3)
ME 523#	Advanced Machine Design	(3)
ME 525#	Metal Fatigue in Engineering	(3)
ME 526#	Advanced Vibrations	(3)
ME 529#	Advanced Finite Element Methods	(3)
ME 532#	Advanced Dynamics	(3)

Mechanical Design Concentration - 129 hours

Requires ME 323/323L and any four of the Mechanical Design Stem technical electives

II. Thermal Sciences Stem:

ME 342#	Intermediate Thermodynamics	(3)
ME 446#	Gas Turbines	(3)
ME 449#	Internal Combustion Engines	(3)
ME 451	Heating and Air Conditioning	(3)
ME 464#	Computational Fluid Dynamics	(3)
ME 476#	Intermediate Fluid Mechanics	(3)
ME 477#	Compressible Fluid Flow	(3)
ME 485	Multiphysics Modeling	(3)
ME 542#	Thermodynamics of Materials	(3)
ME 545	Fluidized-Bed Combustion	(3)
ME 574#	Advanced Heat Transfer	(3)
ME 575#	Conduction and Radiation Heat Transfer	(3)
ME 576#	Convective Heat Transfer	(3)

Thermal Sciences Concentration - 129 hours

Requires ME 306, ME 341 and any four of the Thermal Sciences Stem technical electives

III. Manufacturing and Materials Stem:

ME 313	Material Properties and Selection	(3)
ME 420#	Composite Materials	(3)
ME 428	Advanced Manufacturing Processes	(3)
ME 439	Introduction to Robotics	(3)
ME 524#	Deformation and Fracture	(3)
ME 525#	Metal Fatigue in Engineering	(3)
ME 542	Thermodynamics of Materials	(3)

Manufacturing and Materials Concentration - 129 hours

Requires ME 418 and any four of the Manufacturing and Materials Stem technical electives

IV. Aerospace Concentration - 134 hours

Requires students to complete Avit 102, Introduction to Aviation (5 credits) plus six technical electives. Avit 102 includes earning a private pilot license and is recommended for the summer session between the freshman and sophomore years.

Technical electives must be chosen from the aerospace group of electives as identified by # in the above technical elective listing. One of the technical electives must be either ME 429 or ME 464. ME 490 or ME 590 may also be included in the aerospace group at the discretion of the Mechanical Engineering Chair.