Mechanical Engineering Major

Major Requirements

```
Degree Type: B.S.M.E.
Minimum Credits Required: 130
```

University Degree Requirements

For complete details on these and other university degree requirements, refer to the Degree and Graduation Requirements (http://catalog.ndsu.edu/academic-policies/undergraduate-policies/degree-and-graduation/) section in the University Catalog.

1. Minimum of 120 semester credits (some programs may exceed this minimum).
2. Complete the University General Education requirements.
3. Minimum institutional GPA of 2.00 based on work taken at NDSU.
4. Minimum of 30 credits in resident at NDSU.
5. Minimum of 36 upper level credits (courses numbered 300 or higher).
6. Students with transfer credit must meet the NDSU 30 credits in residence (#4). Of these 30 credits in residence, a minimum of 15 credits must be in courses numbered 300 or above, and 15 credits must be in the student's declared major curricula.

University General Education Requirements

A list of university approved general education courses along with the administrative policies governing the requirement and the categories is available here (http://catalog.ndsu.edu/academic-policies/undergraduate-policies/general-education/).

Code	Title	Credits
Category C: Communication		**12**
Category R: Quantitative Reasoning		**3**
Category S: Science and Technology		**10**
Category A: Humanities and Fine Arts		**6**
Category B: Social and Behavioral Sciences		**6**
Category W: Wellness		**2**
Category D: Cultural Diversity		
Category G: Global Perspectives		
Category L: Digital Literacy		
Total Credits		**39**

Major Requirements

Code	Title	Credits
Mechanical Engineering Requirements:		
ME 111	Introduction to Mechanical Engineering *	2
ME 212	Fundamentals of Visual Communication for Engineers	3
ME 213	Modeling of Engineering Systems	3
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3
ME 223	Mechanics of Materials	3
ME 331	Materials Science and Engineering	3
ME 331L	Materials Science and Engineering Laboratory	1
ME 351	Thermodynamics I	3
ME 352	Fluid Dynamics	3
ME 412	Engineering Measurements	3
ME 421	Theory of Vibrations	3
ME 442	Machine Design I	3
ME 443	Machine Design II	3
ME 454	Heat and Mass Transfer	3
ME 457	Thermal Systems Laboratory	3

ME 460	Product Design and Development	3
ME 461	Design Project I	3
ME 462	Design Project II	3
MATH 129	Basic Linear Algebra	3
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MATH 259	Multivariate Calculus	3
MATH 266	Introduction to Differential Equations	3
CHEM 121	General Chemistry I (May satisfy general education category S)	3
CHEM 122	General Chemistry II (May satisfy general education category S)	3
ECE 301	Electrical Engineering I	3
ECE 306	Electrical Engineering Lab I	1
ENGL 321	Writing in the Technical Professions (May satisfy general education category C)	3
ENGR 327	Ethics, Engineering, and Technology	3
IME 330	Manufacturing Processes	3
PHYS 252 & 252L	University Physics II and University Physics II Laboratory (May satisfy general education category S)	5
Technical Electives: Select 15 credits from the following:		15
ME 332	Engineering Materials II	
ME 353		
ME 435	Plastics and Polymer Processing in Manufacturing	
or IME 635	Plastics and Injection Molding Manufacturing	
ME 436	Biopolymers and Biocomposites	
ME 437	Engineering Ceramics	
ME 468	Introduction to Biomechanics	
ME 469	Energy Storage Technology	
ME 470	Renewable Energy Technology	
ME 471	Experimental Stress Analysis	
ME 472	Fatigue and Fracture of Metals	
ME 473	Engineering with Polymeric Materials	
ME 474	Mechanics of Composite Materials	
ME 475	Automatic Controls	
ME 476	Mechatronics	
ME 477	ME Finite Element Analysis	
ME 478	Advanced Flow Diagnostics	
ME 479	Fluid Power Systems Design	
or ABEN 479	Fluid Power Systems Design	
ME 480	Biofluid Mechanics	
ME 481	Fundamentals of Energy Conversion	
ME 482	Fuel Cell Science and Engineering	
ME 483	Introduction to Computational Fluid Dynamics	
ME 484	Aerospace Propulsion	
ME 485	Heating, Ventilation and Air Conditioning	
ME 486	Nanotechnology and Nanomaterials	
or CE 686	Nanotechnology and Nanomaterials	
ME 487	Internal Combustion Engines	
ME 488	Introduction to Aerodynamics	
ME 489	Vehicle Dynamics	
Approved technical electives from other departments - no more than 3 courses from the following:		
ABEN 456	Biobased Energy	
CPM 473	Polymer Synthesis	
CPM 474	Applied Polymer Science	

CPM 475	Coatings' Materials Science
CPM 486	Corrosion and Materials
CSCI 485	Artificial Intelligence for Robots and Cyber-Physical Systems
ECE 461	Control Systems I
ECE 463	Modern Control
ECE 485	Biomedical Engineering
ECE 487	Cardiovascular Engineering
ECE 488	Cardiovascular Engineering II
ENGR 410	Entrepreneurship for Engineers and Scientists
ENGR 321	Introduction to Robotics
ENGR 379	Global Seminar
IME 380	CAD/CAM for Manufacturing
IME 430	Process Engineering
IME 431	Production Engineering
IME 432	Composite Materials Manufacturing
IME 433	Additive Manufacturing
IME 440	Engineering Economy
IME 450	Systems Engineering and Management
IME 460	Evaluation of Engineering Data
IME 465	Introduction to Machine Learning
IME 485	Industrial and Manufacturing Facility Design
PHYS 350	Modern Physics
PHYS 355	Classical Mechanics
PHYS 361	Electromagnetic Theory
PHYS 485	Quantum Mechanics I
Total Credits	**110**

* Students who have completed ABEN 110, CE 111, CM&E 111, ECE 111, IME 111 or ENGR 111 are not required to take ME 111.

Degree Requirements and Notes

- No grades less than 'C' will be accepted to fulfill a degree requirement.
- No more than nine credits of approved technical electives may be taken outside the ME department.
- Admission to the Mechanical Engineering Major program (Junior/Senior years) requires a minimum 2.70 engineering GPA and a minimum 2.50 cumulative GPA.
- A 2.50 cumulative GPA is required for graduation requirements.