

MECHANICAL ENGINEERING, BS

Mechanical engineering program is a versatile engineering program, and is designed for students who are interested in applying their solid backgrounds and knowledge of mathematics, science, and general engineering to design and conduct experiments; analyze and interpret data; and design systems, components, and processes to meet desired needs for a long-lasting societal impact.

Mechanical engineers pursue careers in the automotive, aerospace, chemical, computer, communication, defense, energy, railroad and robotics industries, just to name a few. Mechanical engineers are also found in almost all manufacturing industries. Increasingly, mechanical engineers are needed in the environmental and bio-medical fields, and many of our graduates have pursued education in medicine and law. Without a doubt, virtually every product or service in modern life has probably been touched in some way by a mechanical engineer!

Accreditation

Information can be found on Department website.

Students earning the Bachelor of Science in Mechanical Engineering (BS) degree must complete all University, College and departmental degree requirements for a total of 130 credits. These include General Education requirements and the following major requirements and ancillary requirements. Additional information, including a semester-by-semester flowchart of degree requirements, can be found on the departmental website. Students completing the Bachelor of Science in Mechanical Engineering (BS) degree must comply with all College of Engineering academic policies and requirements and departmental policies.

Major and Ancillary Requirements

Major Courses

		Hours
ENGR 101	The World of Engineering	1
ENGR 104	Fundamentals of Engineering	3
ENGR 161	Small-Scale Eng. Graphics	1
AEM 201	Statics	3
AEM 250	Mechanics Of Materials I	3
AEM 251	Mechanics Of Materials I Lab	1
AEM 264	Dynamics	3
AEM 311	Fluid Mechanics	3
ECE 320	Fundmtl Electrical Engr	3
ME 215	Thermodynamics I	3
ME 305	Thermodynamics II	3
ME 309	Heat Transfer	3
ME 349	Engineering Analysis	3
ME 350	Static Machine Components	3
ME 351	Finite Element Lab	1
ME 360	Contrl Instrumnt Components	3
ME 372	Dynamic Systems	3
ME 383	Modern Manufacturg Processes	3
ME 410	Eng in Social & Global Context	3
ME 450	Dynamic Machine Components	3
ME 460	Energy Systems	4
ME 489	Mechanical Engr Design I	3
ME 490	Mechanical Engr Design II	3
MFE 290	Capstone Exp: Found of Program	3

MTE 271	Engr Matls: Struc Prop	3
Mechanical Engineering Elective (See table for course options)		6
Mechanical Engineering Technical Elective (See table for course options)		3
Credit Hours Subtotal:		77

Ancillary Courses

CH 101 or	General Chemistry	4
CH 117	Honors General Chemistry	
MATH 125 or	Calculus I	4
MATH 145	Honors Calculus I	
MATH 126 or	Calculus II	4
MATH 146	Honors Calculus II	
MATH 227 or	Calculus III	4
MATH 247	Honors Calculus III	
MATH 238	Appld Diff Equations I	3
PH 105 or	General Physics W/Calc I	4
PH 125	Honors Gen Ph W/Calculus	
PH 106 or	General Physics W/Calc II	4
PH 126	Honors Gen Ph W/Calculus II	
Approved Science (See table for course options)		4
Credit Hours Subtotal:		31

General Education Courses

The specific courses each student completes in order to fulfill the University of Alabama's general education requirements will depend upon the particular degree program in which the student is enrolled. To determine how these general education requirements are integrated into your program of study, review your semester-by-semester flowchart and discuss with your academic advisor.

Mechanical Engineering (ME) Elective

The Mechanical Engineering (ME) elective requires a minimum of six credits from the following list of courses.

Mechanical Engineering (ME) Elective		Hours
AEM 313	Aerodynamics	3
AEM 341	Aerospace Structures	3
AEM 360	Astronautics	3
AEM 368	Flight Mechanics	3
AEM 408	Propulsion Systems	3
AEM 413	Compressible Flow	3
AEM 416	Helicopter Theory	3
AEM 446	Intermediate Solid Mechanics	3
AEM 453	Multiscale Adv. Composites	3
AEM 455	Nondestructive Evaluation	3
AEM 469	Orbital Mechanics	3
AEM 470	Mechanical Vibrations	3
AEM 484	Space Environment	3
ECE 350	Electric Power & Machines	3
ECE 380	Digital Logic	4
ECE 383	Microcomputers	4
ECE 439	Thin Film Technology	3

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ECE 451	Power Electronics	3	MFE 338	Introduction to Industry 4.0	1
ECE 452	Power Electronics Laboratory	1	MFE 342	Fundamentals of Material Proc.	3
ECE 453	Power Systems	3	MFE 385	Metrology	4
ECE 454	Power Systems Laboratory	1	MFE 442	Adv Mat Sci and Add Processes	3
ECE 466	Fund of Nanotechnology	3	MFE 473	Dis Sim of Manufacturing Sys	3
GES 320	Eng Entrp. Idea. and Discovery	3	MFE 483	Computer Aided Manufacturing	3
GES 400	Engineering Statistics	3	MFE 485	Mod Manufacturing Practices II	3
ME 364	Vehicle Dynamics	3	MTE 316	Fundamentals of Metal Casting	4
ME 377	Noise Control	3	MTE 362	Thermodynamics Of Materials	4
ME 380	Engineering Leadership I	1	MTE 373	Physical Metallurgy	4
ME 406	Thermal Power Systems	3	MTE 439	Metallurgy Of Welding	3
ME 407	Heatg Ventilat Air-Condg	3	MTE 481	Analy Methods For Matls	4
ME 411	Cmp Heat Transfer & Fluid Flow	3	MTE 487	Corrosion	3
ME 414	Principles of Combustion I	3			
ME 416	Energy Conservtn & Manag	3			
ME 417	Sustainable Energy	3			
ME 420	Gas Turbines	3			
ME 421	Reliability & Maint. Engr.	3			
ME 424	Automotive Manufacturing	3			
ME 426	Internal Combustion Engines	3			
ME 430	Fuzzy Set Theory & Application	3			
ME 440	Failure of Engr Materials	3			
ME 442	Multiscale Material Design	3			
ME 446	Atomistic Mod of Materials	3			
ME 448	Biomechanics of Human Movement	3			
ME 452	Fundamentals of Auto. Systems	3			
ME 454	Auto. Elec. and Electron. Sys.	3			
ME 456	Mechatronics	3			
ME 458	Mode. and Sim. Auto. Sys.	3			
ME 464	Add. Manufac. of Metals Design	3			
ME 470	Mechanical Vibrations	3			
ME 471	Fundamentals Of Acoustics	3			
ME 472	Intro to Robotic Kinematics	3			
ME 475	Control Systems Analysis	3			
ME 480	Engineering Leadership II	2			
ME 485	Microfabrication	3			
ME 491	Special Problems	1 to 6			
ME 492	Automotive Experience	1			
ME 493	Automotive Experience Capstone	1			
ME 497	Mechanical Engineering Project	1 to 3			
MFE 204	Basics of Manufac. and Auto.	3			
MFE 222	Robotic Welding	1			
MFE 224	Industrial Auto with Robotics	1			
MFE 226	Instrumentation for Automation	1			
MFE 232	Flex Manufacturing Sys	1			
MFE 262	Intro Industrial Internt Thngs	1			
MFE 290	Capstone Exp: Found of Program	3			
MFE 302	Advanced PLC	1			
MFE 303	Adv Auto & Matl Handling	1			
MFE 320	Plant Engineering	3			
MFE 326	Process Monitoring and Control	1			
MFE 332	Quality Control In Manufac Sys	3			

Mechanical Engineering (ME) Technical Elective

The Mechanical Engineering (ME) Technical Elective requires a minimum of three credits from the following list of courses, or three credits from the Mechanical Engineering (ME) elective list.

Mechanical Engineering (ME) Technical Elective		Hours
AEM 420	Computational Fluid Dynamics	3
AEM 448	Stochastic Mechanics	3
AEM 452	Composite Materials	3
AEM 488	Adv. Space Propulsion & Power	3
CE 320	Intro Environmental Engineerg	3
CE 331	Intro to Structural Eng.	3
CE 378	Water Resources Engineering	3
CE 480	Forensic Engineering	3
CHE 412	Polymer Materials Engineering	3
ECE 341	Electromagnetics	3
ECE 462	Semiconductor Optoelectronics	3
GES 421	Engineering Venture Launch	3
MTE 402	Matls & Process Select/Design	3
MTE 450	Plasma Proc of Thin Films	3
AY 421	Theoretical Astrophysics	3
AY 433	Observational Techniques	3
AY 450	Stars & Stellar Evolution	3
BSC 300	Cell Biology	3
BSC 303	Field Zoology	3
BSC 304	Field Botany	3
BSC 310	Microbiology	3
BSC 314	Dendrology	3
BSC 315	Genetics	3
BSC 320	Freshwater Studies	4
BSC 325	Tropical Plant Diversity	4
BSC 340	Principles of Nat. Res. Cons.	3
BSC 360	Plant Biology	4
BSC 371	Biology of Lower Plants	4
BSC 373	Vertebrate Zoology	4
BSC 380	Intro Stats Biology	3
BSC 385	Ecology and Evolution	3
BSC 393	Biology Outreach	2

BSC 400	Vertebrate Funct Morphol	4	CH 102	General Chemistry	4
BSC 412	Limnology	3	CH 118	Honors General Chemistry	4
BSC 413	Cave Biology	3	GEO 101	The Dynamic Earth	4
BSC 460	Human Developmental Biology	4	GEO 102	The Earth Through Time	4
CH 223	Quantitative Analysis	4	GEO 103	Introduction to Oceanography	4
CH 231	Elem Organic Chemistry I	3	GEO 104	Hazardous Earth	4
CH 232	Elem Organic Chem II	3	GEO 105	Sustainable Earth	4
GEO 355	Invertebrate Paleontology	3	GY 100	Environmental Science	4
GEO 364	Dinosaur Paleobiology	3	GY 101	Atmospheric Proc & Patterns	4
GEO 369	Introduction Geophysics	3	GY 102	Earth Surface Processes	4
GEO 403	Petroleum System Analysis	3	GY 104	Honors Earth Surface Processes	4
GEO 405	Introductory Biogeochemistry	3	GY 202	The Water Planet	4
GEO 407	Seismology	3	GY 207	Field Water and Climate	4
GEO 470	Introduction to Geochemistry	3	PH 253	Intro Modern Physics	4
GY 302	Climatology	3	& PH 255	and Modern Physics Lab	4
GY 363	Geomorphology	3			
MATH 237	Introduction to Linear Algebra	3			
MATH 301	Discrete Mathematics	3			
MATH 311	Intro Scientific Computing	3			
MATH 343	Appl Diff Equations II	3			
MATH 355	Theory Of Probability	3			
MATH 371	Advanced Linear Algebra	3			
MATH 410	Numerical Linear Algebra	3			
MATH 420	Linear Optimization Theory	3			
MATH 421	Non-Linear Optimization Theory	3			
MATH 441	Boundary Value Problems	3			
MATH 470	Prin Modern Algebra I	3			
MATH 485	Intro Complex Variables	3			
MATH 486	Real Analysis I	3			
MATH 487	Intro to Real Analysis II	3			
PH 301	Mechanics I	3			
PH 302	Intermediate Mechanics	3			
PH 331	Elect & Magnetism I	3			
PH 354	Intermediate Modern Physics	3			
PH 411	Biophysics	3			
PH 434	Digital Electronics	3			
PH 451	Machine Learning	3			
PH 471	Thermal Physics	3			
PH 481	Solid State Physics	3			

Approved Science

The Approved Science requires a minimum of four credits from the following list of courses.

Approved Science		Hours
AY 101	Intro To Astronomy	4
& AY 102	and Intro Astronomy Lab	
AY 203	Observational Astronomy	5
& AY 204	and Solar System Astronomy	
BSC 108	Intro Biology Non Maj I	4
BSC 109	Intro Biology Non Maj II	4
BSC 114	Principles Of Biology I	4
& BSC 115	and Laboratory Biology I	
BSC 118	Honors General Biology I	4

Our graduates accept positions in aerospace, automotive, energy, railroad, manufacturing, food/forest products, appliances, robotics, electric power, electronics, automation, heating/air-conditioning, construction, mining, defense/ military, business, law and medicine.

Types of Jobs Accepted

Entry level engineering jobs in project engineering, production supervision, product design, process design, maintenance, plant layout, technical marketing/ sales, contract supervision, engineering consulting, graduate education in engineering, business, law, medicine and dentistry.

Jobs of Experienced Alumni

Positions in project leadership, plant management, R&D management, contractors, technical sales/marketing executives, entrepreneurs, consulting firm executives/ owners, corporate executives/ managers/ owners, business management, physicians, attorneys, dentists, military officers, college faculty, and federal/ industrial researchers.

Learn more about opportunities in this field at the Career Center