MICHIGAN TECH - Mechanical Engineering - Technical Electives

2024-2025 Academic Year (Planned) Course offerings subject to change.

Refer to the schedule of classes in BanWeb for current offerings, pre-requisites, restrictions, and course descriptions.

MEEM Courses By Course Number (including other courses on the Aerospace Engineering, Manufacturing, and Naval Systems Engineering minors, and ENG courses)

See below for guidelines regarding eligible courses in other engineering departments.

Course Number	Credits	Title	Summer 2024	Fall 2024	Spring 2025	Aerospace Engineering Minor	Manufacturing Minor	Naval Systems Engineering Minor
CEE5520	3	Introduction to Hydrodynamic Modeling			X			ELECTIVE
EE4227	3	Power Electronics		X				ELECTIVE
EE4228	1	Power Electronics Lab		X				ELECTIVE
EE4240	4	Introduction to MEMS (Micro ElectroMechanical Systems)	----------NOT OFFERED----------				PROCESS	
EE4252	4	Digital Signal Processing and its Applications		X				ELECTIVE
EE4490	4	Laser Systems and Applications		X				ELECTIVE
EE4777	3	Open-Source 3-D Printing	Track A (online)				PROCESS	
ENG4300	3	Engineering Project Management	Track A (online)	X	X			
ENG4505	3	Systems Analysis & Model Design		X				
ENG4515	3	Introduction to Sustainability and Resilience		X				
MEEM4150	3	Intermediate Mechanics of Materials		X		REM. ELEC.		ELECTIVE
MEEM4170	3	Failure of Materials in Mechanics			X	REM. ELEC.		ELECTIVE
MEEM4180	3	Engineering Biomechanics			X	REM. ELEC.		ELECTIVE
MEEM4200	3	Principles of Energy Conversion & Storage			X			
MEEM4201	3	Applied Thermodynamics		X		REM. ELEC.		
MEEM4202	3	Intermediate Fluid Mechanics and Heat Transfer		X		ELECTIVE		
MEEM4210	3	Computational Fluids Engineering		X		ELECTIVE		ELECTIVE
MEEM4220	3	Internal Combustion Engines I		X				
MEEM4230	3	Compressible Flow/Gas Dynamics			X	ELECTIVE		
MEEM4235	3	Wind Energy		X				
MEEM4240	3	Combustion & Air Pollution		X				
MEEM4250	3	Heating/Ventilation/Air Conditioning			X			
MEEM4260	3	Fuel Cell Technology			X			
MEEM4295	3	Introduction to Propulsion Systems for Hybrid Electric Vehicles		X				ELECTIVE
MEEM4296	3	Experimental Studies in Hybrid Electric Vehicles		X				
MEEM4404	3	Mechanism Synthesis/Dynamic Modeling			X			
MEEM4405	3	Intro to Finite Element Method			X			
MEEM4430	4	Advanced Computer Aided Design and Manufacturing Methods	Track A (online section available)	X	X		SYSTEM	
MEEM4450	3	Vehicle Dynamics			X			
MEEM4610	3	Advanced Machining Processes	----------NOT OFFERED----------				PROCESS	
MEEM4615	4	Metal Forming Processes	----------NOT OFFERED----------					
MEEM4625	3	Precision Manufacturing and Metrology	----------NOT OFFERED----------				PROCESS	
MEEM4630	3	Human Factors	----------NOT OFFERED----------			REM. ELEC.	SYSTEM	ELECTIVE
MEEM4635	3	Design with Plastics	----------NOT OFFERED----------				PROCESS	
MEEM4640	3	Micromanufacturing Processes		X			PROCESS	
MEEM4650	3	Quality Engineering	Track A (online section available)	X		REM. ELEC.	SYSTEM	ELECTIVE
MEEM4655	3	Production Planning	Track A (online section available)		X		SYSTEM	
MEEM4665	3	Introduction to Lean Manufacturing			X		SYSTEM	
MEEM4675	3	Design of Material Handling Systems	----------NOT OFFERED----------				SYSTEM	
MEEM4685	3	Environmentally Responsible Design & Manufacturing	----------NOT OFFERED----------					
MEEM4695	3	Additive Manufacturing			X		PROCESS	
MEEM4701	4	Analytical and Experimental Modal Analysis		X		ELECTIVE		ELECTIVE
MEEM4702	3	Shock and Vibration			X	REM. ELEC.		ELECTIVE
MEEM4704	3	Acoustics and Noise Control			X	REM. ELEC.		ELECTIVE
MEEM4705	4	Introduction to Robotics and Mechatronics			X	REM. ELEC.	SYSTEM	ELECTIVE
MEEM4707	3	Autonomous Systems		X	X	REM. ELEC.	SYSTEM	ELECTIVE
MEEM4720	3	Space Mechanics			X	ELECTIVE		
MEEM4730	3	Dynamic System Simulation			X			
MEEM4775	4	Analysis & Design of Feedback Control Systems		X		REM. ELEC.		
MEEM4810	3	Introduction to Aerospace Engineering		X		REQUIRED		
MEEM4820	3	Introduction to Aerospace Propulsion			X	ELECTIVE		
MEEM4850	3	Naval Systems and Platforms	----------NOT OFFERED----------					REQUIRED
MEEM5110	3	Continuum Mechanics/Elasticity		X				
MEEM5130	3	Nanoscale Science and Technology	----------NOT OFFERED----------					
MEEM5150	3	Advanced Mechanics of Materials		X				
MEEM5160	3	Experimental Stress Analysis		X				
MEEM5170	3	Finite Element and Variational Methods in Engineering		X				
MEEM5180	3	Mechanics of Composite Materials			X	ELECTIVE		
MEEM5190	3	Machine Learning for Engineering Applications			X			

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MEEM Courses By Course Number (including other courses on the Aerospace Engineering, Manufacturing, and Naval Systems Engineering minors, and ENG courses)

See below for guidelines regarding eligible courses in other engineering departments.

Course Number	Credits	Title	Summer 2024	Fall 2024	Spring 2025	Aerospace Engineering Minor	Manufacturing Minor	Naval Systems Engineering Minor
MEEM5201	1	Fundamentals of SI Engines	Short Course (3 days, dates TBA)					
MEEM5202	1	Fundamentals of Diesel Engines	----------NOT OFFERED----------					
MEEM5203	1	SI Engine Control Systems	Short Course (3 days, dates TBA)					
MEEM5204	1	Diesel Engine Control Systems	----------NOT OFFERED----------					
MEEM5210	3	Advanced Fluid Mechanics		X				
MEEM5212	3	Intermediate Thermodynamics	----------NOT OFFERED----------					
MEEM5225	3	Advanced Power System and Pollution Control	----------NOT OFFERED----------					
MEEM5230	3	Advanced Heat Transfer	----------NOT OFFERED----------					
MEEM5240	3	Computational Fluid Dynamics			X			
MEEM5250	3	Internal Combustion Engines II	----------NOT OFFERED----------					
MEEM5255	3	Advanced Powertrain Instrumentation and Experimental Methods			X			
MEEM5265	3	Physical Gasdynamics	----------NOT OFFERED----------					
MEEM5270	3	Advanced Combustion	----------NOT OFFERED----------					
MEEM5275	3	Energy Storage Systems	----------NOT OFFERED----------					
MEEM5280	3	Phase Change and Two-Phase Flows			X			
MEEM5295	3	Advanced Propulsion Systems for Hybrid Electric Vehicles			X			
MEEM5296	3	Powertrain Integration in HEV	----------NOT OFFERED----------					
MEEM5300	3	Cybersecurity of Industrial Control Systems		X				
MEEM5315	3	Cyber Security of Automotive Systems I			X			
MEEM5401	3	Design for Reliability	----------NOT OFFERED----------				PROCESS	
MEEM5430	3	Human Factors - Transportation	----------NOT OFFERED----------					
MEEM5440	3	Advanced Vehicle Dynamics	----------NOT OFFERED----------					
MEEM5645	3	Numerical Analysis of Manufacturing Processes	----------NOT OFFERED----------					
MEEM5665	3	Micro & Nano Fabrication for Energy	----------NOT OFFERED----------					
MEEM5670	3	Experimental Design in Engineering	Track A (online section available)		X		PROCESS	
MEEM5680	3	Optimization I		X			SYSTEM	
MEEM5685	3	Environmentally Responsible Design & Manufacturing	----------NOT OFFERED----------					
MEEM5700	4	Dynamic Measurement/Signal Analysis		X				
MEEM5701	3	Intermediate Dynamics		X				
MEEM5702	3	Analytical Vibroacoustics		X				
MEEM5703	4	Experimental Methods Vibro-Acoustics	----------NOT OFFERED----------					
MEEM5715	3	Linear Systems Theory and Design		X				
MEEM5750	3	Model-Based Embedded Control System Design		X				
MEEM5800	3	Advanced Engineering Mathematics with Applications	Full Semester (online)					
MEEM5811	3	Automotive Systems		X				
MEEM5812	3	Automotive Control Systems			X			
MEEM5990	3	Polymer Nanocomposites		X				
MSE4240	4	Introduction to MEMS	----------NOT OFFERED----------				PROCESS	
MSE4310	3	Principles of Metal Casting		X			PROCESS	
MSE4320	3	Corrosion and Environmental Effects			X			ELECTIVE
MSE4430	3	Composite Materials			X	ELECTIVE		ELECTIVE
MSE4777	3	Open-Source 3-D Printing	----------NOT OFFERED----------				PROCESS	

In addition to the above courses, any 4000+ level courses in the College of Engineering except MET courses are acceptable for ME technical electives. **MET courses are not acceptable for ME technical elective credits, except for MET 4377.** These prefixes - BE, CM, CEE, EE, ENG, GE, MEEM, MSE - may be used by BSME students for technical elective credits (if allowed to enroll in the course by the offering department) with the following exceptions: BE4000, BE4900, BE4901, BE4910, BE4930, BE5000, BE5900, BE5930, CEE4510, CEE4900, CEE4905, CEE4910, CEE4915, CEE4916, CEE4920, CEE4930, CEE4990, CEE5190, CEE5250, CEE5390, CEE5490, CEE5560, CEE5561, CEE5562, CEE5563, CEE5590, CEE5690, CEE5890, CEE5920, CEE5930, CEE5990, CEE5991, CEE5992, CEE5994, CEE5997, CEE5998, CEE5999, CM4000, CM4020, CM 4040, CM4060, CM4080, CM4855, CM4860, CM4861, CM4900, CM4910, CM4990, CM5900, CM5950, CM5990, EE4000, EE4800, EE4805, EE4870, EE4901, EE4910, EE5290, EE5805, EE5900, EE5990, EE5991, EE5992, EE5994, ENG4060, ENG4070, ENG4900, ENG4905, ENG4910, ENG4990, ENG5060, ENG5100, ENG5200, ENG5300, ENG5400, ENG5990, ENG5998, GE4000, GE4900, GE4910, GE4916, GE4930, GE4931, GE4933, GE4934, GE4961, GE4962, GE4970, GE5187, GE5930, GE5940, GE5950, GE5960, GE5970, GE5994, GE5995, GE5998, GE5999, MEEM4990, MEEM4901, MEEM4911, MEEM4999, MEEM5010, MEEM5990, MEEM5994, MEEM5995, MEEM5999, MEEM6000, MSE4130, MSE4131, MSE4140, MSE4141, MSE4970, MSE4990, MSE5100, MSE5900, MSE5970, and MSE5990 or any other research/special topics/seminar/senior design/etc. credits (courses without a specific course description and/or syllabus). Undergraduate students cannot typically enroll in 6000-level courses. Special topics courses (4990, 5990, etc.) may be approved on an individual section/semester basis if a student/faculty member submits or creates a course syllabus for evaluation. OSM 4300 and EET 4144 are also acceptable.