

BS Mechanical Engineering

William States Lee College of Engineering
 Mechanical Engineering & Engineering Science Department
 2023-2024, New Gen Ed

This is an example semester-by-semester plan of study for the Bachelor of Science in Mechanical Engineering (BSME). It should be modified during consultation with a department advisor.

Shaded areas of plan require special attention. GE = General Education

Course Subject and Title	Credits	Min. Grade	Major GPA	Prerequisites	Co-requisites	Important Notes
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Semester One: (15 credit hours)						
ENGR 1201 Intro to Engineering I	2	C	X	MATH 1241		
CHEM 1251 Chemistry I	3	C			CHEM 1251L	GE; Complete MEGR 1100 <u>OR</u> CHEM 1251/1251L.
CHEM 1251L Chemistry Lab	1	C			CHEM 1251	
MEGR 1100 Fund Sci and Math	4			ENGR 1201		
MATH 1241 Calculus I	3	C		MATH 1103 or Placement		GE
Science Elective	3			CHECK CATALOG		PHYS 1130, BIOL 1110, BIOL 2120, CHEM 1252 or GEOL 1200. A lab is not required. Biomedical Concentration should take BIOL 1110.
Theme Course 1	3			CHECK CATALOG		GE
Semester Two: (15/16 credit hours)						
ENGR 1202 Intro to Engineering II	2	C	X	ENGR 1201 MATH 1241		
PHYS 2101 Physics I	3	C		MATH 1241	PHYS 2101L	GE
PHYS 2101L Physics I Lab	1	C			PHYS 2101	PHYS 1101L equivalent to PHYS 2101L
MATH 1242 Calculus II	3	C		MATH 1241		GE
WRDS 1103/1104 Writing & Inquiry	3/4	C				GE; Placement by First Year Writing
Theme Course 2	3					GE
Semester Three: (16/17 credit hours)						
PHYS 2102 Physics II	3	C		PHYS 2101 MATH 1242	PHYS 2102L	
PHYS 2102L Physics II Lab	1	C			PHYS 2102	PHYS 1102L equivalent to PHYS 2102L
MEGR 2141 Engineering Mechanics I	3	C	X	PHYS 2101 MATH 1242		
MATH 2171 Differential Equations	3	C		MATH 1242		
Theme Course 3	3			CHECK CATALOG		GE
CTCM 2530 Critical Thinking and Communication	3			WRDS 110x		GE
MEGR 2299 Intro to Motorsports Engineering	1	C	X	Admission to Motorsports		Motorsports Engineering Concentration Only
MEGR 2279 Intro to Biomedical Engineering	1	C	X	Admission to Biomedical		Biomedical Engineering Concentration Only
Semester Four: (17/18 credit hours)						
MEGR 2180 Manufacturing Systems	3	X	X	ENGR 1202 MEGR 2141 PHYS 2102L	MEGR 2156	
MEGR 2156 Design Project Lab I	2	C	X	ENGR 1201 ENGR 1202 MEGR 2141 PHYS 2102	MEGR 2180	
MEGR 2144 Solid Mechanics	3	C	X	MEGR 2141		
MATH 2241 Calculus III	3	C		MATH 1242		
ECGR 2161 Basic Electrical Engineering	3	C	X	PHYS 2102		
MEGR 2240 Computational Methods	3	C	X	MEGR 2141		Grade of D or better in MEGR 2141. MEGR 2240 may be taken in the summer after the 4th semester or moved to the 5th semester.
MEGR 2499 Intro to Energy Engineering	1	C	X	Admission to Energy		Energy Engineering Concentration Only
MEGR 2289 Intro to Precision Eng & Metrology	1	C	X	Admission to Precision & Metrol		Precision Engineering Concentration Only

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Semester Five: (16 credit hours)

MEGR 3111 Thermodynamics I	3	C	X	MATH 2171 PHYS 2101		
MEGR 3121 Dynamics Systems I	3	C	X	MEGR 2141 MATH 1242		
MEGR 3161 Engineering Materials	3	C	X	CHEM 1251 or MEGR 1100 MATH 2171 MEGR 2144		
MEGR 3171 Measurement & Instrumentation	2		X	ECGR 2161 MATH 2241	MEGR 3171L	
MEGR 3171L Instrumentation Lab	2	C	X	PHYS 2102L	MEGR 3171	
ME Technical Elective 1	3		X	CHECK CATALOG		

Semester Six: (16 credit hours)

MEGR 3112 Thermodynamics II	3		X	MEGR 3111		
MEGR 3122 Dynamics II	3		X	MEGR 3121 MEGR 2240 MATH 2171		
MEGR 3114 Fluid Mechanics	3	C	X	MEGR 3121 MATH 2241		
MEGR 3156 Design Project Lab II	2	C	X	ECGR 2161 MEGR 2144 MEGR 2156 MEGR 2180		
MEGR 3116 Heat Transfer	3		X	MEGR 2171 MEGR 3111	MEGR 3114	MEGR 3116 may be taken in the summer after the 6th semester or moved to the 7th semester.
MEGR 3152 Mechanics & Materials Lab	2		X	MEGR 2144 MEGR 3171L MEGR 3161 MEGR 3121		

Semester Seven: (13 credit hours)

MEGR 3X55/3275 Senior Design I	2		X	MEGR 3111 MEGR 3161 MEGR 3114 MEGR 3156 MEGR 3171L	MEGR 3152 MEGR 3251	
MEGR 3251 Thermal/Fluid Lab	2		X	MEGR 3111 MEGR 3171L MEGR 3114		
ME Technical Elective 2	3		X	CHECK CATALOG		
Math Elective	3			CHECK CATALOG		Option 1: STAT 3128 Option 2: MATH 2164 OR MATH 3171 plus MEGR 3282 as a Technical Elective
MEGR 3221 or MEGR 3216 Design Elective	3		X	CHECK CATALOG		

Semester Eight: (12 credit hours)

MEGR 3X56/3276 Senior Design II	2		X	MEGR 3X55 MEGR 3275		
ME Technical Elective 3	3		X	CHECK CATALOG		
ME Technical Elective 4	3		X	CHECK CATALOG		
Theme Course 4	3					GE
ENGR 3295 Professional Development	1		X	SENIOR OR JUNIOR STANDING		

General Requirements Summary			
Minimum Total Credit Hours	General Education Hours	Minimum	
		Major GPA	Overall GPA
120	12	2.0	2.0

Areas	Credit Hours	Description
Pre-Major/Prerequisites	0	Does not apply.
Major	84	
General Education (not satisfied by other major requirements)	15	These courses fulfill the General Education
Related Work	0	Does not apply.
Foreign Language	0	Does not apply.
Science Elective	3	Chosen from BIOL 1110, BIOL 2120, CHEM 1252, GEOL 1200 or PHYS 1130.
Math Elective	3	*See below.
Technical Electives	12	**Four technical electives provide depth of learning in chosen areas.
Design Elective	3	***MEGR 3216 or MEGR 3221
Total Credit Hours	120	121 hours with a concentration in Motorsports Engineering, Biomedical Engineering or Energy Engineering

All MEGR students are required to complete: a) a math elective and b) a course with appropriate statistics content. The math elective will not also count as a technical elective. For either option, five courses are required to fulfill the requirements of math, statistics and technical electives.

Option 1 - STAT 3128 fulfills math elective and statistics requirements (plus students will need four technical electives).

Option 2 - MATH 2164 or MATH 3171 plus MEGR 3282 as a Technical Elective

Biomedical Engineering students are required to fulfill the math elective via option 1 and the science elective via BIOL 1110 or BIOL 2120.

**At least three of the four courses that are required as technical electives must be courses with a MEGR course designation. Courses that are approved as technical electives are listed below. In parentheses beside each course are designations for approval as an elective for given concentration (B - Biomedical Engineering, E - Energy Engineering, M - Motorsports Engineering, and P - Precision Engineering and Metrology). New technical electives may be offered as MEGR 3090, MEGR 3092, MEGR 3094 or MEGR 3097, and their descriptions are available each semester on a list in the Mechanical Engineering office, the MEES Academic Advising course in Canvas, and the MEES website.

Approved Technical Electives with MEGR Designation	Approved Technical Electives with non-MEGR Designation
MEGR 309X: Designated as approved technical electives MEGR 3214: Refrigeration and A/C (E) MEGR 3221 (B,E,M; will count as a technical elective only if MEGR 3216 is completed to fulfill the Design Elective) MEGR 3222: Machine Analysis and Design II MEGR 3225: Introduction to Finite Element Analysis (B,E,M, P) MEGR 3231: Advanced CAD/CAM (M, P) MEGR 3232: Plastic Part Design (B) MEGR 3236: Introduction to Nanoscale Science and Engineering MEGR 3238: Microscopy for Engineering (B) MEGR 3241: Motorsports Instrumentation (M) MEGR 3245: Advanced Experimental Methods (M) MEGR 3260: Clean Coal Technology (E) MEGR 3261: Sustainable Energy (E) MEGR 3262: Turbomachinery (E) MEGR 3272: Introduction to Bio-polymers and Composites (B) MEGR 3282: Statistical Process Control and Metrology (E, M, P) MEGR 3283: Metrology and Precision Engineering (P) MEGR 3451: Stationary Power Plant Systems (E) MEGR 3452: Introduction to Nuclear Engineering (E) MEGR 409x: Special Topics Courses [4092 (M), 4094 (E), 4097 (B), 4098 (P)] MEGR 4235: Waves and Optics (P)	MEGR 4143: Discrete Mechanical Vibrating Systems (P) MEGR 4237: Introduction to Control Systems (M, P) MEGR 4210: Automotive Powerplants (M, E) MEGR 4211: Road Vehicle Dynamics (M) MEGR 4240: Advanced Automotive Powerplants (M) MEGR 4242: Applied Vehicle Aerodynamics (M) MEGR 4244: Tire Mechanics (M) MEGR 4271: Orthopedic Biomechanics (B) MEGR 4272: Mechanics of the Human Locomotor System (B) MEGR 4273: Regenerative Neural Engineering (B) MEGR 4274: Bioelectronic Medicine (B) MEGR 4280: Advanced Manufacturing Processes (P)
	Approved Technical Electives with non-MEGR Designation BIOL 3161 (B) MATH 3171 (which may count as either a math elective or a technical elective, but not both) PHYS 3220 PHYS 4110 (B) PHYS 4140 PHYS 4232 PHYS 4242 PHYS 4271

Concentrations			
BSME students may elect to complete an optional concentration requiring a one credit hour introductory course, technical electives approved for the chosen concentration, and a senior design sequence focused in the concentration area.			
Motorsports Engineering	Energy Engineering	Biomedical Engineering	Precision Engineering and Metrology
MEGR 2299 Intro to Motorsports Engineering	MEGR 2499 Intro to Energy Engineering	MEGR 2279 Intro to Biomedical Engineering	MEGR 2289 Intro to Precision Engineering and Metrology
MEGR 3355 Motorsports Senior Design I	MEGR 3455 Energy Senior Design I	MEGR 3275 Biomedical Senior Design I	MEGR 3285 Precision Senior Design I
MEGR 3356 Motorsports Senior Design II	MEGR 3456 Energy Senior Design II	MEGR 3276 Biomedical Senior Design II	MEGR 3286 Precision Senior Design II