

# BS Mechanical Engineering

William States Lee College of Engineering  
 Mechanical Engineering & Engineering Science Department  
 2022-2023

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   W = Writing in the Discipline   O = Oral Communication						
Course Subject and Title	Credits	Min. Grade	Major GPA	Prerequisites	Co-requisites	Important Notes
<b>Semester One: (15 credit hours)</b>						
ENGR 1201 Intro to Engineering I	2	C	X	MATH 1241		
CHEM 1251 Chemistry I	3	C			CHEM 1251L	GE; Complete MEGR 1100 <b>OR</b> 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, CHEM 1252 or GEOL 1200. A lab is not required. Biomedical Concentration should take BIOL 1110.
LBST Requirement 1: LBST 110X	3			CHECK CATALOG		GE; LBST 110X Arts & Society
<b>Semester Two: (15/16 credit hours)</b>						
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
LBST Requirement 2: LBST 2101, 2102 or 221X	3					GE; LBST 2101, 2102 or 221X
<b>Semester Three: (16/17 credit hours)</b>						
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		
ECON 2101 or 2102 Macro- or Micro- Economics	3			Sophomore Standing		GE; Social Science
LBST Requirement 3: LBST 2301 Critical Thinking & Communication (CTC)	3			Sophomore Standing		GE; Transfers with CTC credit or GE catalog prior to Fall 2017 require LBST 2101, 2102 or 221X.
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
<b>Semester Four: (17/18 credit hours)</b>						
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

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<b>Semester Five: (16 credit hours)</b>						
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 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	GE; W
ME Technical Elective 1	3		X	CHECK CATALOG		
<b>Semester Six: (16 credit hours)</b>						
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		GE; W
<b>Semester Seven: (13 credit hours)</b>						
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		GE; W
ME Technical Elective 2	3		X	CHECK CATALOG		
Math Elective	3			CHECK CATALOG		Option 1: STAT 3128 Option 2: MEGR 3282 AND MATH 2164 OR MATH 3171
MEGR 3221 or MEGR 3216 Design Elective	3		X	CHECK CATALOG		
<b>Semester Eight: (12 credit hours)</b>						
MEGR 3X56/3276 Senior Design II	2		X	MEGR 3X55 MEGR 3275		GE; O
ME Technical Elective 3	3		X	CHECK CATALOG		
ME Technical Elective 4	3		X	CHECK CATALOG		
LBST Requirement 4: LBST 2101, 2102 or 221X	3					GE; LBST 2101, 2102 or 221X
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	87	Required courses also fulfill the General Education Communication Skills requirements (Writing in the Disciplines and Oral Communication).
General Education (not satisfied by other major requirements)	12	These four 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 - MEGR 3282 plus MATH 2164 or MATH 3171

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, and M - Motorsports Engineering). 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 3210: Automotive Power Plants (E,M) MEGR 3211: Road Vehicle Dynamics (M) 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 MEGR 3225: Introduction to Finite Element Analysis (B,E,M) MEGR 3231: Advanced CAD/CAM (M) MEGR 3232: Plastic Part Design (B) MEGR 3233: Introduction to Biomaterials (B) MEGR 3234: Introduction to Biodynamics (B) MEGR 3235: Waves and Optics MEGR 3236: Introduction to Nanoscale Science and Engineering MEGR 3237: Introduction to Control Systems (E,M) MEGR 3238: Microscopy for Engineering (B) MEGR 3240: Advanced Automotive Power Plants (M) MEGR 3241: Motorsports Instrumentation (M) MEGR 3242: Applied Vehicle Aerodynamics (M) MEGR 3243: Automotive Powertrain Lab (M) MEGR 3244: Tire Mechanics (M)	MEGR 3245: Advanced Experimental Methods (M) MEGR 3260: Clean Coal Technology (E) MEGR 3261: Sustainable Energy (E) MEGR 3262: Turbomachinery (E) MEGR 3270: Biomedical Fluidics: Microfluidics (B) MEGR 3271: Biomedical Manufacturing: 3D Biofabrication (B) MEGR 3282: Statistical Process Control and Metrology (E,M) MEGR 3283: Metrology and Precision Engineering MEGR 3451: Stationary Power Plant Systems (E) MEGR 3452: Introduction to Nuclear Engineering (E) MEGR 4143: Discrete Mechanical Vibrating Systems  <b>Approved Technical Electives with non-MEGR Designation</b> 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
MEGR 2299 Intro to Motorsports Engineering	MEGR 2499 Intro to Energy Engineering	MEGR 2279 Intro to Biomedical Engineering
MEGR 3355 Motorsports Senior Design I	MEGR 3455 Energy Senior Design I	MEGR 3275 Biomedical Senior Design I
MEGR 3356 Motorsports Senior Design II	MEGR 3456 Energy Senior Design II	MEGR 3276 Biomedical Senior Design II