Engineering Mechanics Curriculum Checklist

Title	Course	Cr.	Pre/Co-Requisites	Term	Grade
Chemistry					
General Chemistry for Engineering 1	CHEM 0960	3			
General Chemistry for Engineering 2	CHEM 0970	3	CHEM 0960		
General Engineering					
Introduction to Engineering Analysis	ENGR 0011	3			
Engineering Computing	ENGR 0012	3	ENGR 0011		
Materials Structures & Properties	ENGR 0022	3	PHYS 0175, MATH 0230		
Statics & Mechanics of Materials 1	ENGR 0135	3	MATH 0230, PHYS 0174		
Statics & Mechanics of Materials 2	ENGR 0145	3	ENGR 0135		
Humanities & Social Sciences					
Humanities Elective*		3			
Social Sciences Elective*		3			
Humanities/Social Sciences Elective*		3			
Humanities/Social Sciences Elective*		3			
Humanities/Social Sciences Elective*		3			
Humanities/Social Sciences Elective * ‡		3			
Mathematics					
Analytical Geometry & Calculus 1	MATH 0220	4			
Analytical Geometry & Calculus 2	MATH 0230	4	MATH 0220		
Analytical Geometry & Calculus 3	MATH 0240	4	MATH 0230		
Matrices & Linear Algebra	MATH 0280	3	MATH 0220		
Differential Equations	MATH 0290	3	MATH 0230		
Vector Analysis & Applications	MATH 1550	3	MATH 0240, MATH 0280		
Mechanical Engineering					
Introduction to Design	MEMS 0024	3	ENGR 0011		
Linear Circuits & Systems 1	MEMS 0031	3	PHYS 0175, MATH 0230		
Introduction to Thermodynamics	MEMS 0051	3	PHYS 0175, CHEM 0960		
Introduction to Fluid Mechanics	MEMS 0071	3	PHYS 0175, CHEM 0970, MATH 0290		
Experimental Methods in MSE	MEMS 1010	3	ENGR 0022		
Dynamic Systems	MEMS 1014	3	ENGR 0012, MEMS 0031, MATH 0280		
Rigid Body Dynamics	MEMS 1015	3	ENGR 0135, MATH 0240		
Vibrations	MEMS 1020	3	MEMS 1014		

Mechanical Design 1	MEMS 1028	3	ENGR 0145, MEMS 0031, MEMS 1014/1015		
Mechanical Measurements 1	MEMS 1041	3	ENGR 0145		
Finite Element Analysis	MEMS 1047	3	MEMS 1028		
Structures of Crystals	MEMS 1053	3	ENGR 0022		
Physics					
Physics for Science & Engineering 1	PHYS 0174	4	*MATH 0220*		
Physics for Science & Engineering 2	PHYS 0175	4	PHYS 0174, *MATH 0230*		
Principles of Modern Physics 1	PHYS 0477	4	PHYS 0175, *MATH 0240*		
Upper-Level Physics	PHYS	3			
Program Specific					
Engineering Mechanics Elective		3			
Engineering Mechanics Elective		3			
Senior Design					
Senior Design 1[+]		3			
Senior Design 2[++]		3			
Statistics					
Applied Statistical Methods	STAT 1000	4			

Upper-Level Physics: Physics courses with course numbers > 1000

[+] A senior design course offered by one of the other SSOE engineering programs is required. Alternatively, may be ENGR 1050 Product Realization, or with preapproval, a senior design project arranged with a faculty mentor and taken as ENGSCI 1801.
[++] A semester-long research experience under the supervision of a faculty advisor at Pitt, not necessarily within the Swanson School of Engineering. Note that this requirement may also be fulfilled by participation in an undergraduate research program like the MCSI URP or the SURI during the summer semester.

[‡]A University designated writing intensive course

*All Humanities and Social Science electives must be from the SSOE approved list. Two courses need to be in single area (see SSOE guidelines).

Italicized courses indicate co-requisites; courses must be taken prior to or concurrently.

Engineering Mechanics Program Electives

The Engineering Mechanics curriculum requires two program elective courses. It is suggested that the two courses be selected to form an area of specialization. Possible elective courses are given below:

Health & Rehabilitation Sciences
HRS 1701 Introduction to Prosthetics and Orthotics

Bioengineering
BIOENG 1630 Biomechanics 1: Mechanical Principles of Biological Systems
BIOENG 1631 Biomechanics 2: Introduction to Biodynamics and Biosolid Mechanics
BIOENG 1632 Biomechanics 3: Biodynamics of Movement
BIOENG 1633 Biomechanics 4: Biomechanics of Organs, Tissues, and Cells

Civil Engineering
CEE 1330 Introduction to Structural Analysis
CEE 1341 Design of Steel Structures
CEE 1401 Open Channel Hydraulics
CEE 1412 Introduction to Water Resources Engineering
CEE 1811 Principles of Soil Mechanics
CEE 1821 Foundation Engineering

Material Science
MEMS 0040 Materials and Manufacturing
MEMS 1011 Structure and Properties Lab
MEMS 1048 Analysis and Characterization at the Nanoscale
MEMS 1053 Structures of Crystals and Diffraction
MEMS 1058 Electromagnetic Properties of Materials
MEMS 1059 Phase Equilibria in Multi-Component Materials
MEMS 1063 Phase Transformation & Microstructure Evolution
MEMS 1070 Mechanical Behavior of Materials
MEMS 1111 Materials for Energy Generation and Storage

Mechanical Engineering
MEMS 1045 Automatic Controls
MEMS 1049 Mechatronics
MEMS 1051 Applied Thermodynamics
MEMS 1052 Heat and Mass Transfer
MEMS 1057 Micro/Nano Manufacturing
MEMS 1071 Applied Fluid Mechanics
MEMS 1082 Electromechanical Sensors and Actuators

Physics
PHYS 1331 Mechanics
PHYS 1341 Thermodynamics and Statistical Mechanics