Engineering Mechanics

University Requirements (23-24)
Writing – American Thought and Language (ATL) 4
Integrative Studies in Humanities (IAH) 8
Integrative Studies in Social Sciences (ISS) 8
Bioscience (one of the following):
   BS 110, BS 111, ENT 205, MMG 205,
   MMG 301, PLB 105, PSL 250, ZOL 141  3-4

College Requirements (29)
CEM 141 General Chemistry I 4
CSE 131 Introduction to Technical Computing 3
MTH 132 Calculus I 3
MTH 133 Calculus II 4
MTH 234 Multivariable Calculus 4
MTH 235 Differential Equations 3
1PHY 183 Physics for Scientists & Engineers I 4
1PHY 184 Physics for Scientists & Engineers II 4

Major Requirements  (49)
CEM 161 Chemistry Laboratory I 1
ECE 345 Electronic Instrumentation & Systems 3
ME 180 Engineering Graphic Communications 3
ME 201 Thermodynamics 3
ME 221 Statics 3
ME 222 Mechanics of Deformable Solids 3
ME 425 Experimental Mechanics 3
ME 332 Fluid Mechanics 4
ME 361 Dynamics 3
ME 423 Inter. Mechanics of Deformable Solids 3
ME 424 Computational Mechanics 3
ME 464 Intermediate Dynamics 3
ME 492 Snr Research & Design Project I (W) 3
ME 492 Snr Research & Design Project II (W) 3
MSE 250 Materials Science and Engineering 3
MTH 314 Matrix Algebra with Applications 3
PHY 191 Physics laboratory for Scientists I 1
PHY 192 Physics Laboratory for Scientists II 1

Technical Elective Requirements (18/19)
Computational Mechanics  (Option I)
ME 410 Heat Transfer 3
ME 412 Heat Transfer Lab 2
ME 461 Mechanical Vibrations 4
MTH 4XX Mathematics Elective 3
STT 351 Probability and Statistics for Engrs 3
Select one of the following:
ME 426 Introduction to Composite Materials 3
ME 497 Biomechanical Design 3
ME 432 Intermediate Fluid Mechanics 3
ME 451 Control Systems 4

Computational Mechanics  (Option II)
MTH 4XX Mathematics Electives           6
Select 12 additional credits from approved list 12

Other Electives  7- 9

Total Credits Required for Degree  128

The requirements listed above apply to students admitted to the major of Engineering Mechanics in the Department of Mechanical Engineering (ME) beginning Fall, 2002. The department of Mechanical Engineering constantly reviews program requirements and reserves the right to make changes as necessary. Consequently, each student is strongly encouraged to consult with his/her advisor to obtain assistance in planning an appropriate schedule of courses. Students who have questions about Engineering Mechanics should contact the Engineering Undergraduate Studies Advising Office, 1415 Engineering Building, phone (517)355-6616 ext 1.

Some courses may have prerequisites, which are not otherwise required in the program. Students should check course descriptions to ensure they are aware of prerequisites.
### Engineering Mechanics

#### Sample Program

<table>
<thead>
<tr>
<th></th>
<th>Freshman Year</th>
<th>Sophomore Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>Credits</td>
<td>Spring Credits</td>
</tr>
<tr>
<td>Bioscience (AT)</td>
<td>3 / 4</td>
<td>ATL 1XX 4</td>
</tr>
<tr>
<td>CEM 151</td>
<td>4</td>
<td>CEM 152 3</td>
</tr>
<tr>
<td>CEM 161</td>
<td>1</td>
<td>ISS 3XX 4</td>
</tr>
<tr>
<td>ISS 2XX</td>
<td>4</td>
<td>MTH 133 4</td>
</tr>
<tr>
<td>MTH 132</td>
<td>3</td>
<td>Elective 3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15/16</td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Freshman Year</th>
<th>Sophomore Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td>Credits</td>
<td>Spring Credits</td>
</tr>
<tr>
<td>ECE 345</td>
<td>3</td>
<td>MTH 4XX 3</td>
</tr>
<tr>
<td>ME 361</td>
<td>3</td>
<td>ME 424 3</td>
</tr>
<tr>
<td>ME 423</td>
<td>3</td>
<td>Option 2/3</td>
</tr>
<tr>
<td>MTH 314</td>
<td>3</td>
<td>ME 332 4</td>
</tr>
<tr>
<td>Option</td>
<td>3</td>
<td>Option 3/4</td>
</tr>
<tr>
<td>PHY 192</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

#### Program Objectives

The undergraduate program in Engineering Mechanics must assure that graduates are adequately prepared to enter and continue to practice the engineering science of mechanics. To achieve this, the program must provide a sufficiently broad base of mathematics, physical science, engineering science, computational skills, laboratory experience and design experience in order that the reasonable, responsible and efficient manner. The structure of the curriculum must provide both breadth and depth in the design and analysis of solid structures and systems. The student must demonstrate the ability to use mathematical and computational techniques to model, analyze and design physical systems under steady state and transient conditions from a variety of application structures or system science. Alternative specialization is possible in experimental mechanics educational experience must integrate knowledge and skills acquired in a diverse set of courses and program activities to develop:

1. An ability to apply knowledge of mathematics, science and engineering
2. An ability to design and conduct experiments, as well as to analyze and interpret data
3. An ability to design a system, component, or process to meet desired needs
4. An ability to function on multi-disciplinary teams
5. An ability to identify, formulate, and solve engineering problems
6. An understanding of professional and ethical responsibility
7. An ability to communicate effectively
8. The broad education necessary to understand the impact of engineering solutions in a global and societal context
9. A recognition of the need for, and an ability to engage in life-long learning
10. A knowledge of contemporary issues
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

*Revised March, 2002*