ME List of Undergraduate Laboratory Needs (Based on ME Engineering Fees of $120,000)

The following table contains the requested items for ME in the format requested by the Dean’s office. The total amount requested for the top prioritized items, given in Pages 1-2, is $120,000. The prioritized list of our total current needs (i.e., $120,000) is shown on Pages 1-2 of this document and more detailed descriptions of each request are given on Pages 3-6. Note that some of the items in the prioritized list had to be broken down in the table below to fit the requested format.

- Lab. Equipment > $5,000 (itemize each piece of equipment, lab and function)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamics System Lab (Holmes Hall 308) for ME 402: Experimental Upgrades</td>
<td>$6,000</td>
</tr>
<tr>
<td>Thermal Design Lab (Holmes Hall 308) for ME 480: Experimental Upgrades</td>
<td>$3,000</td>
</tr>
<tr>
<td>Design, Manufacturing, Dynamics, and Thermofluids Labs (Holmes Hall 308</td>
<td>$9,000</td>
</tr>
<tr>
<td>Design Lab (Holmes Hall 309) for ME 481 &amp; 482 as well as ME 480 – ANSYS</td>
<td>$8,000</td>
</tr>
<tr>
<td>Design and Manufacturing Lab (Holmes Hall 140 A) for ME 213, 342, 402,</td>
<td>$9,000</td>
</tr>
<tr>
<td>Thermofluids and Design Labs (Holmes Hall 308) for ME 322, 480, 481, &amp; 482</td>
<td>$12,000</td>
</tr>
<tr>
<td>Manufacturing Lab (Holmes Hall 308) for ME 213, 331, 341, 342, 446, 447,</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

1
## Design and Manufacturing Lab (Holmes Hall 140 A) for ME 213, 375, 481, and 482 - Dynamo System for Electric Vehicles, Electric Boats, Electric Planes (Item 8, Page 6)

- $20,000

## Closed Circuit 24/7 Surveillance Camera for Manufacturing Labs (Holmes 140, 140 A, and 348) for ME 213, 342, 446, 481, and 482 (Item 9, Page 6)

- $3,000

## Regular Personal Services (specify who)

- None .......................................................... $ 0

**Total Lab Equipment > $5,000 and Regular Personnel Services** ....................................... $80,000.00

## Casual Hires (specify function)

**Total Casual Hires (Not from these funds)** ................................................................. $ 0

## Student Assistants (specify the labs) After-Hours Lab Monitors for Holmes 140 and 348 (Item 10, Page 6)

- $15,000

**Total Student Assistants (Not from these funds)** ......................................................... $ 0

## Lab. materials and supplies and lab operations (specify the labs)

- Introduction to Engineering Design – Materials and supplies for ME 213; Holmes Hall 140, 309, & 348 ($1,000/semester), (Item 11, Page 6) ................................................................. $ 2,000
- Materials Manufacturing Lab – Materials and supplies for ME 342; Holmes Hall 140, 308, & 348 ($1,000/semester) (Item 12, Page 7) ................................................................. $ 2,000
- Dynamic System Lab - Sensors and Expendable Materials & Supplies for ME 402; Holmes Hall 308 ($1,000/semester) (Item 13, Page 7) ................................................................. $ 2,000
- Thermofluids Design Lab – Materials and supplies for ME 480; Holmes Hall 308, ($1,000/semester) (Item 14, Page 7) ................................................................. $ 2,000
- Design, Manufacturing, Dynamics, and Thermofluids Labs – Plotter Papers, Ink, & Toner for ME 213, 342, 402, 480, 481, & 482; Holmes Hall 308 & 309 (Item 15, Page 7) ....... $ 1,000
Senior Design Students’ Projects for ME 481 & ME 482; Holmes Hall 140, 309, & 348– (Item 16, Page 7) ......................................................................................................................... $ 12,000

**Total Lab materials and supplies and lab operations** .......................................................... $21,000.00

- **Equipment and Furniture Repairs & Maintenance**

  **Total Equipment and Furniture Repairs and Maintenance** ........................................... $ 0

- **Computer Repairs & Maintenance**

  **Total Computer Repairs & Maintenance** ................................................................. $ 0

- **Computer Software**

  **Total Computer Software** ......................................................................................... $

- **Computer Software License Fees**

  Engineering Software Licensing Fees (Holmes Hall 309) for ME 213, 342, 402, 480, 481 & 482 – SolidWorks Annual Licensing Fees ($2,000) (Item 17, Page 8) ......................... $ 2,000

  Engineering Software Upgrade Licensing Fees (Holmes Hall 308 & 309) for ME 213, 342, 402, 480, 481 & 482 – Windows 7/8, OS, MatLab ($2,000) (Item 18, Page 8) ............... $ 2,000

  **Total Computer Software License Fees** .................................................................... $ 4,000

- **Lab. Equipment for controlled Property (computers etc each with price tag of < $5,000)**

  **Total Lab. Equipment for controlled Property (each <$5,000)** ................................. $ 0,000

- **ME Total Top Prioritized List Price:** $80,000 + $15,000 + $21,000 + 4,000 = $120,000

- **ME Available Eng Fees:** $120,000
**M.E. Engineering Fee**

**Priority List**

1. **Dynamics System Laboratory (ME 402; Holmes Hall 308)**
   
   Dynamics System Lab (Holmes Hall 308) for ME 402 – **Experimental Upgrades**  
   $6,000

   Systems and Components are needed for experimental upgrades.

2. **Thermal Design Laboratory (ME 480; Holmes Hall 308)**
   
   Thermal Design Lab (Holmes Hall 308) for ME 480 – **Experimental Upgrades**  
   .................................................................................................................................... $3,000

   Systems and Components are needed for experimental upgrades.

   
   Design, Manufacturing, Dynamics, and Thermofluids Labs (Holmes Hall 308 and 309) for ME 213, 342, 402, 480, 481, & 482 – **Computer Server** (1 @ $9,000 each)  
   .................................................................................................................................... $9,000

   A computer server is needed to run the computers in Holmes 309 and 308 faster commensurate with the needs of the upgraded software as well as avoiding break-downs during the semesters.
4. Design and Thermofluids Laboratories (ME 480, 481, & 482; Holmes Hall 309)

Design Lab (Holmes Hall 309) for ME 481 & 482 as well as Thermofluids Lab for ME 480 - ANSYS Package (Structures-Static Linear/Nonlinear, Fluent-CFD, LSDYNA-Dynamic Crash/Impact) Software Package Annual Licensing Fees $8,000

ANSYS Software is an important CAD (Computer Aided Design) tool with Solid Modeling and Finite Element Analysis (FEA) software important for our Mechanical Design Students. This software is needed since for complex structures and problems Solid Work Cosmos will be inadequate. In addition, due to the needs for aerodynamics and impact/crash analyses for projects such as Aero Design, Supermileage, Formula, etc. the additional modules of the ANSYS software such as Fluent and LSDYNA are necessary. The Fluent CFD module of the ANSYS software are also useful for the thermofluids design projects as well as aerodynamic analysis in ME 480, 481, and 482.

5. Design and Manufacturing Laboratories (ME 213, 342, 402, 446, 451, 480, 481, & 482; Holmes Hall 140 A)

Design and Manufacturing Lab (Holmes Hall 140 A) for ME 213, 342, 402, 446, 451, 480, 481, & 482 – 3D Printer $9,000

The current 3D printer is too small and is not practical for most of the projects. Hence, a larger 3D printer is needed in ME to manufacture real-size components for ME student projects for the courses mentioned above.

6. Thermofluids and Design Laboratories (ME 322, 480, 481, & 482; Holmes Hall 308)

Thermofluids and Design Labs (Holmes Hall 308) for ME 322, 480, 481, & 482 – Wind Tunnel $12,000

The ME Department lacks a wind tunnel. A Table-Top Wind Tunnel is needed for Thermofluids and Design & Manufacturing projects in ME.

7. Manufacturing Laboratory (ME 213, 331, 341, 342, 446, 447, 481, & 482; Holmes Hall 308)

Manufacturing Lab (Holmes Hall 308) for ME 213, 331, 341, 342, 446, 447, 481, & 482 – High-Resolution Microscope $10,000

The ME Department lacks a high resolution microscope for advanced materials. A High-Resolution Microscope is needed for Advanced Materials for ME Courses mentioned above.
8. Design and Manufacturing Laboratory (ME 213, 375, 481, & 482; Holmes Hall 140 A)

Design and Manufacturing Lab (Holmes Hall 140 A) for ME 213, 375, 481, and 482 – Dynamo System ........................................................................................................ $20,000

The ME Department lacks a Dynamo System for the Design and Manufacturing of Electric Vehicles, Boats, Planes, etc. A Dynamo System is needed for the Design and Manufacturing of Electric Vehicles, Boats, Planes, etc. in ME.

9. Manufacturing Laboratories (ME 213, 342, 446, 481, & 482; Holmes Hall 140, 140A, and 348)

Manufacturing Labs (Holmes Hall 140, 140A, & 348) for ME 213, 342, 446, 481, and 482 – Closed Circuit 24/7 Surveillance Camera ......................................................... $3,000

A Closed Circuit 24/7 Surveillance Camera is needed in ME Department for the Manufacturing Labs (Holmes 140, 140 A, and 348) for ME 213, 342, 446, 481, and 482 for students’ safety purpose.

10. Manufacturing Laboratory (ME 213, 342, 446, 481, & 482; Holmes Hall 348)

Manufacturing Lab (Holmes Hall 348) for ME 213, 342, 446, 481, and 482 – After-Hours Lab Monitor(s) ........................................................................................................ $15,000

After-Hours Lab Monitors are needed in ME Department for the Manufacturing Lab-ME Machine Shop (Holmes Hall 348) for ME 213, 342, 446, 481, and 482 for students’ safety purpose.

11. Introduction to Engineering Design Lab (ME 213; Holmes Hall 140, 309, & 348)

Introduction to Engineering Design – Materials and supplies for ME 213; Holmes Hall 140, 309 & 348 ($1,000/semester) $1,000 x 2 = $2,000
12. **Materials Manufacturing Lab (ME 342; Holmes Hall 140, 308, 348)**

Materials Manufacturing Lab – **Materials and supplies** for ME 342; Holmes Hall 140, 308, & 348  
($1,000/semester)  
$1,000 x 2 = $2,000

13. **Dynamic System Lab (ME 402; Holmes Hall 308)**

Dynamic System Lab - **Sensors and Expendable Materials & Supplies** for ME 402; Holmes Hall 308  
($1,000/semester)  
$1,000 x 2 = $2,000

14. **Thermofluids Design Lab (ME 480; Holmes Hall 308)**

Thermofluids Design Lab - **Materials & Supplies** for ME 480; Holmes Hall 308  
($1,000/semester)  
$1,000 x 2 = $2,000

15. **Design, Manufacturing, Dynamics, and Thermofluids Laboratories (ME 213, 342, 402, 480, 481, & 482; Holmes Hall 308 & 309)**

Design, Manufacturing, Dynamics, and Thermofluids Labs – Plotter Papers, Ink, & Toner for ME 213, 342, 402, 480, 481, & 482; Holmes Hall 308 & 309  
$1,000

16. **Senior Design Student Projects (ME 481 & 482; Holmes Hall 140, 309, & 348)**

**Senior Design Students’ Projects Funding (about 10% for each project)** for ME 481 & ME 482; Holmes Hall 140, 309, & 348  
$12,000

Financial support for student projects in ME 481 & ME 482 (includes Needed Design Hardware & Software). This includes Design funding for ME 481 & ME 482 for both Sections I & II and for both Fall 2013 and Spring 2014 Semesters.
17. **Solid Works Software (ME 213, 342, 402, 480, 481, & 482; Holmes Hall 309)**

**Solid Works** Engineering Software Annual Licensing Fees (Holmes Hall 309) for ME 213, 342, 402, 480, 481 & 482 – SolidWorks  
$2,000

Solid Works Software is an important CAD (Computer Aided Design) tool with Solid Modeling, 3-views drawings with dimensioning and tolerancing, and COSMOS Finite Element Analysis (FEA) software important for our Mechanical Design Students.

18. **Engineering Software (ME 213, 342, 402, 480, 481, & 482; Holmes Hall 308 & 309)**

Engineering Software Upgrade Licensing Fees (Holmes Hall 308 & 309) for ME 213, 342, 402, 480, 481, & 482 – Windows 7/8, OS, and Matlab  
$2,000