ENGINEERING OFFERINGS: MEETING THE NEEDS OF THE STATE OF WISCONSIN

Presentation at the UW System Board of Regents

February 6, 2015

Dr. David J. Ward
Interim Senior Vice President
Office of Academic and Student Affairs

May 2014:
31,461 Employed in Engineering Professions

Department of Workforce Development Data
May 2014
ADDITIONS AND ELIMINATIONS OF PROGRAMS

![Graph showing the number of programs implemented and suspended/eliminated from 2004-05 to 2013-14. The graph indicates a trend of increasing implemented programs and decreasing suspended/eliminated programs over time.](image-url)
TREND IN THE NUMBER OF ACADEMIC DEGREE PROGRAMS 1974-2014

Number of Programs

1974-75 1,252 1975-76 1,224
1976-77 1,000 1977-78 1,100
1978-79 1,200 1979-80 1,300
1980-81 1,300 1981-82 1,300
1982-83 1,300 1983-84 1,300
1984-85 1,300 1985-86 1,300
1986-87 1,300 1987-88 1,300
1988-89 1,300 1989-90 1,300
1990-91 1,300 1991-92 1,300
1992-93 1,300 1993-94 1,300
1994-95 1,300 1995-96 1,300
1996-97 1,300 1997-98 1,300
1998-99 1,300 1999-00 1,300
2000-01 1,300 2001-02 1,300
2002-03 1,300 2003-04 1,300
2004-05 1,300 2005-06 1,300
2006-07 1,300 2007-08 1,300
2008-09 1,300 2009-10 1,300
2010-11 1,300 2011-12 1,300
2012-13 1,300 2013-14 1,300

Number of Programs
Presentation Overview

- Supply of Engineering Graduates
- Demand for Engineering Graduates
- UW System Approval Process
- Statewide Approach to Engineering Needs
- UW System Recommendations
## TOP 5 ENGINEERING OCCUPATIONS IN WISCONSIN

1. Mechanical  
   - 7520
2. Industrial  
   - 7400
3. Civil  
   - 4830
4. Electrical  
   - 3970
5. Electronics  
   - 1660

Source: DWD 2014

- 46% of Engineers Employed in Manufacturing
- Median Earnings: $77,250
2013 BACCALAUREATE DEGREE WISCONSIN ENGINEER OUTPUT

Public – UW  1306 (70%)

Private  569 (30%)

Total:  1875
BACCALAUREATE ENGINEERING DEGREES CONFERRED BY UW CAMPUSSES IN 2013

<table>
<thead>
<tr>
<th>University</th>
<th>Degrees Conferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>UW-Madison</td>
<td>691</td>
</tr>
<tr>
<td>UW-Platteville</td>
<td>407</td>
</tr>
<tr>
<td>UW-Milwaukee</td>
<td>250</td>
</tr>
<tr>
<td>UW-Stout</td>
<td>175</td>
</tr>
<tr>
<td>UW-Stevens Point</td>
<td>16</td>
</tr>
</tbody>
</table>
UW-PLATTEVILLE – UW COLLEGES
COLLABORATIVE ENGINEERING PROGRAMS IN
MECHANICAL AND ELECTRICAL ENGINEERING

Delivered at:

• UW-Barron
• UW-Fox Valley
• UW-Rock County
• UW-Baraboo
• UW-Manitowoc
• UW-Marathon
• UW-Marshfield
• UW-Sheboygan
• UW-Washington
• UW-Waukesha
• UW-Marinette
• UW-Richland
• UW-Fond du Lac
UW-PLATTEVILLE COLLABORATIVE ENGINEERING
ENROLLMENT AND DEGREES CONFERRED FROM
2008-2014

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Electrical</th>
<th>Mechanical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-09</td>
<td>13</td>
<td>38</td>
<td>51</td>
</tr>
<tr>
<td>2014-15*</td>
<td>71</td>
<td>100</td>
<td>171</td>
</tr>
</tbody>
</table>
# COLLABORATIVE ENGINEERING ENROLLMENT AND DEGREES CONFERRED FROM 2008-2014

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Electrical</th>
<th>Mechanical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/9</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>2013/14</td>
<td>10</td>
<td>22</td>
<td>32</td>
</tr>
</tbody>
</table>

Total Degrees Conferred: 27 (Electrical) + 62 (Mechanical) = 89

- Total Degrees Conferred includes 2008 through 2014 numbers.
- The total number of graduates from the program since 2002 (the initiation of the program) is 121.
Estimated percent of UW System engineering graduates who stay in the state

65%
Demand for Engineering Graduates
Identifies 5 engineering fields in which there is a need in the State of Wisconsin:

- Chemical
- Civil
- Electrical
- Industrial
- Mechanical
NCHEMS STUDY: ENGINEERING DEMAND
Identifies Geographic Need

Demand/Supply Ratio

New North 134.0
Centergy 79.5
M-7 Milwaukee 4.6

Demand Rule: $d/s>3$ indicates demand
Demand: Job postings – Burning Glass
Supply: Integrated Postsecondary Education Data System (IPEDS)
EDUCATIONAL ADVISORY BOARD (EAB) STUDY: ENGINEERING DEMAND

Top 5 Wisconsin counties – North and West

2010-13 Job Postings for Mechanical, Electrical, and Chemical Engineering

<table>
<thead>
<tr>
<th>County</th>
<th>Postings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marathon</td>
<td>233</td>
</tr>
<tr>
<td>La Crosse</td>
<td>183</td>
</tr>
<tr>
<td>Saint Croix</td>
<td>132</td>
</tr>
<tr>
<td>Eau Claire</td>
<td>121</td>
</tr>
<tr>
<td>Wood</td>
<td>77</td>
</tr>
</tbody>
</table>
Letters of Support from more than 20 organizations in Northwest and Central Wisconsin

• Among others, from:
  • Bonduelle Americas
  • Momentum West
  • Stratasys Advanced Material Center
  • Polk, St. Croix, Greater Menomonie, Pierce, and other County Economic Development Corporations
  • Fiberstar Bio-Ingredient Technologies
  • MarquipWard United
  • Catalytic Combustion Corporation
UW System and Statewide Plan for Meeting Engineering Needs
WHAT IS THE NET ANNUAL ENGINEERING DEMAND?

- 31,461 Engineers
- 6% Estimated Turnover Rate
- 1,887 Estimated Annual Demand
- 1,200 Graduates that stay in the State

- 687 Annual Deficit (Not including any growth)
PROGRAM APPROVAL PROCESS
## REQUESTS FOR 8 ENGINEERING PROGRAMS

<table>
<thead>
<tr>
<th>Institution</th>
<th>Program</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>UW-Eau Claire</td>
<td>B.S. in Materials Science and Engineering</td>
<td>September 13, 2013</td>
</tr>
<tr>
<td>UW-River Falls</td>
<td>B.S. in Environmental Engineering &amp; B.S. in Agricultural Engineering</td>
<td>October 15, 2013</td>
</tr>
<tr>
<td>UW-Stevens Point</td>
<td>B.S. in Chemical Engineering &amp; B.S. in Environmental Engineering</td>
<td>December 12, 2013</td>
</tr>
<tr>
<td>UW-Stout</td>
<td>B.S. in Chemical Engineering, B.S. in Electrical Engineering, &amp; B.S. in Mechanical Engineering</td>
<td>December 20, 2013</td>
</tr>
</tbody>
</table>
ACIS 1.0
NEW PROGRAM APPROVAL PROCESS

<table>
<thead>
<tr>
<th>Process</th>
<th>Responsible for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Approval of Notice of Intent to Plan</td>
<td>UW System Administration</td>
</tr>
<tr>
<td>2. Planning</td>
<td>Campuses &amp; UWS Admin.</td>
</tr>
<tr>
<td>3. Recommendation to BOR</td>
<td>UWS Administration</td>
</tr>
<tr>
<td>4. Authorization</td>
<td>Board of Regents</td>
</tr>
<tr>
<td>5. Implementation</td>
<td>Campuses</td>
</tr>
<tr>
<td>6. Review</td>
<td>Campuses and UWS Admin.</td>
</tr>
</tbody>
</table>

WHERE WE ARE IN THIS APPROVAL PROCESS:

• 1st Step:
• Notice of Intent to Plan
• 2nd Step: Planning

- At Each Campus
- Following Governance Processes
- Creating Authorization Document
Conditions for Authorization

- Clear Demand Case
- No New Resources: Self-financed
- Consortial Element to Reduce Cost
- ABET Accreditation Process
Conditions for Authorization cont.

- Mission Congruence
- Non-Duplication
- Overall Cost
- Higher Learning Commission Approval (If Applicable)
3RD AND 4TH STEPS: AUTHORIZATIONS

• System Decision to Recommend

• Board of Regents Decision to Approve
UW SYSTEM STATEWIDE RECOMMENDATIONS
COST / FINANCING FOR NEW PROGRAMS

Options include:

- Reallocation
- Industry Support
- No New State Dollars
Meet the needs of the Northwest

- Mechanical – Stout
- Materials Science – Eau Claire
- Chemical – Stevens Point
- Agriculture – River Falls
Second System Administration Recommendation

Meet the needs of the Northeast

- Platteville Collaborative Programs
- Further Develop Planning for Expansion
Meet the needs of the Southeast:

- UW-Milwaukee
- UWM & UW-Parkside Collaborative
- UW-Platteville-Rock County Collaborative
- UW-Madison & UW-Whitewater
Fourth System Administration Recommendation

Meet the needs of the state engineering research

- UW-Madison
- UW-Milwaukee
- Applied Research at UW Comprehensives
Fifth System Administration Recommendation

- UW-Madison
- UW-Milwaukee

Expand

Continuing Education

- Emerging Continuing Education at UW Comprehensives
- Further Discussion and Planning
Sixth System Administration Recommendation

Meet the Needs of the State for Graduate Education

• UW-Milwaukee
• UW-Madison
Meeting the Needs of the Northwest Timeline

• Intent to Plan – February 2015

• Request for Board Authorization – Starting in April/June 2015
REGENT DISCUSSION

Recommendations