Building Partnerships with Industry: Providing Students with Industry Consulting Experience

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Outline

• Why is building industrial partnerships important?
• What steps are important?
• Model 1: Lund Boats
• Model 2: LaValley Industries
• The Future
Why is building industrial partnerships important?

• Job opportunities
• Real projects/problems
• Improves the program
• University & Community
Steps – Engage and Grow Collaborative Partnerships

• Make a Contact
• Find a Connection
• Setup the Connection
• Maintain the Connection
Lund Boats

- Northern Minnesota Company
- 501-1000 employees
- $100-500 million USD/year
Lund Boats
Make a Contact

- October 9, 2017 – Alumnus contact (adhesive failure)
- November 29, 2017 – Meet with VP for Finance
- November 30, 2017 – Decision made
Involving Students

• Create Directed Independent Study Course
  • TADT4910-DIS: Shear Strength Testing

• Student Expectations:
  • Read ASTM Standard: D13165 (adhesives in shear)
  • Read Plan of Work and Income Contract
  • Number Samples
  • Test Samples
  • Analyze Data
  • Read Test Report
**Income Contract**

- Contract Between Minnesota State Colleges and Universities AND Lund Boats (Brunswick Boat Group)
- $475 to test 15 samples
- Create Cost Center – Funds for Materials Science Lab
- Consulting Fee
Plan of Work

FIG. 1 Form and Dimensions of Test Specimen

Note 1—L = length of test area. Length of test area can be varied. Recommended length of lap is 0.50 ± 0.01 in. (12.7 ± 0.3 mm).
Testing
Data Analysis

Figure 1: Force vs. stroke at 30°F

Figure 2: Force vs. stroke at 70°F
Data Analysis

![Force vs. stroke at 110°F](image1.png)

![Average failing load of shear area vs. temperature](image2.png)

Figure 3: Force vs. stroke at 110°F

Figure 4: Average failing load of shear area vs. temperature
Partnership Benefits

• Industry
  • Inexpensive, Professional Materials Testing
  • Improved Production
  • Future Employees
• University
  • Student Recruiting
  • Case Studies

• Students
  • Real Engineering Experience
  • Free Credit
  • Resume Boost
Student Feedback

• Pheng Vang: “It was a great opportunity for me to come see, learn, and get a hands-on experience regarding metallographic and shear testing. Overall I was very excited and satisfied with my learning experience…”

• Thomas Younker: “My personal experience with Lund Boats materials testing at Bemidji State University was exceptional and beneficial to me both professionally and educationally.”
Lund Boats Facility Tour
Spring 2018
Share the Future
Share the Future
Subsequent Contracts - Brinell Hardness Testing
Subsequent Contracts - Brinell Hardness Testing
“The design change was beneficial to our mfg. team as it saved several process steps on each boat produced without sacrificing quality of our end product.”
Subsequent Contracts – Rivet Testing
Subsequent Contracts – Metallography
LaValley Industries – Another Partnership Model
Another Partnership Model

- LaValley Industries Engineers attend BSU courses
- These Engineers are now qualified to run Materials Testing equipment
  - Tensile Testing – Proprietary Polymer
  - Metallography – STRENX 900 (high strength steel)
Metallography – STRENX 900
Partnership Benefits

• Industry
  • Free use of Lab space
  • Continuous Improvement for Employees
  • Future Employees

• University
  • New Advisory Board Member
  • Increase Lab Use

• Students/Employees
  • Apply Classroom Knowledge to their Job
The Future

Digi-key Electronics

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Polaris
TEAM Industries
Marvin Windows

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Lund Boats & LaValley Industries