LAKE SUPERIOR STATE UNIVERSITY

LSSU Industrial Advisory Board

Spring Meeting

APRIL 29, 2011

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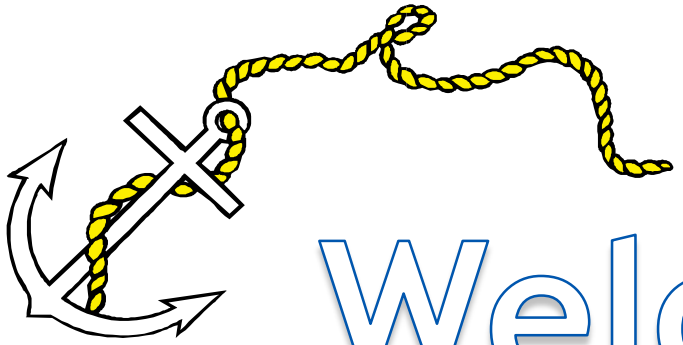

Welcome!

Fred Berg

LAKE SUPERIOR STATE UNIVERSITY

AGENDA

8:00 – 8:30 am	**Informal Discussion – All Welcome**	
8:30 – 8:40 am	**Meeting Call to Order** – Fred Berg	*INFORMATION*
8:40 – 8:55 am	**Secretary Report** – Nathan Callaghan Approve Minutes / Action Items from November Meeting	*ACTION*
8:55 – 9:15 am	**Chairman Report –** Fred Berg Chairman Election New IAB Candidate	*ACTION*
Committee Reports		
9:15 – 9:30 am	**Subcommittees Report** Recruiting / MACRO Events: Chris Conklin	*FEEDBACK*
Lake Superior State University Updates		
9:30 – 11:30 am	**School Updates** – Ron Delap **Program Updates –** David Baumann & Robert Hildebrand	*FEEDBACK*
Senior Projects		
11:30 – 11:45am	**2010 / 2011 Senior Project Evaluations** Evaluation Form Overview	*INFORMATION*
11:45 – 11:55 am	**2011 / 2012 Senior Project Proposals** Discussion	*ACTION*
11:55 – 12:00 pm	**Closing Remarks / Next Meeting – November 4, 2011** IAB Host Location: Gaylord, MI (proposed)	*ACTION*
12:00 – 1:00 pm	**Lunch – Walker Cisler Center, Anchor Room**	
1:00 – 5:00 pm	**Senior Project Presentations – CAS 212**	*ACTION*

IAB Members: What's New

- **Nathan Callaghan** has been awarded four Patents
- **Bob Anderson** is participating as a industrial advisor for Senior Projects
- **Chris Conklin** participated in a meet LSSU night held in Midland Michigan in February
- **Darryl Dinel**, started a new job as Senior Automation Engineer, Mechanical and Industrial Engineering Nike-WHQ, email: darryl.dinel@nike.com, Cell: 404-226-7341
- **Charlie Litzner** retiring from Cloverland Electric Cooperative this May

2011 Engineering Salary Outlook

Ref: Engineering Salary.com

Electrical Engineer Salary

- Electrical engineers hold about **319,100 jobs**, making this the second largest branch of the U.S. engineering community (behind software engineering).
- Most electrical engineers are employed by manufacturers of electrical/electronic components and computer/office equ ipment, industrial machinery, and professional, medical and scientific instruments.
- California, Texas, Maryland, New York, Georgia and New Jersey employ nearly 40% of all electrical engineers nationwide.

Mechanical Engineer Salary

- Mechanical engineers hold about **251,900 jobs**. More than 2 out of 5 are in manufacturing, primarily in machinery, transportation equipment, electrical equipment, instruments and fabricated metal products industries.

2011 Engineering Salary Outlook

Electrical Engineer Salaries

- Electrical engineer salary range for the middle 50% is between $62,420 and $104,180. Median annual electrical engineer salary in the industries employing the largest numbers are:
- Computer and office equipment: $73,790
  Measuring and control devices: $76,910
  Search and navigation equipment: $78,140
  Electronic peripherals, components and accessories: $76,820
  Engineering service firms: $71,650
  Federal Government $74,850
  RF Engineering: $87,230
- Advanced electrical engineering degrees are in high demand by both Fortune 500s and start-ups. The highest electrical engineer salaries for experienced engineers are concentrated on the east and west coasts, and average nearly 7% higher than the rest of the United States.

Electrical Engineering Employment Outlook

- Electrical engineer job opportunities should be favorable into 2015. The number of electrical engineer job openings resulting from employment growth, and the need to replace electrical engineers who transfer to other occupations, are promoted, or leave the labor force is expected to be in rough balance - because of the sharply reduced supply of recent electrical engineering new graduates (which has declined annually since 2003).

2011 Engineering Salary Outlook

Mechanical Engineer Salaries

- Mechanical engineer salary range for the middle 50% is between $55,680 and $89,910. Median annual mechanical engineer salary in the industries employing the largest numbers are:

  Federal government: $68,770
  Engineering and architectural services: $69,150
  Motor vehicles and equipment: $72,190
  Construction and related machinery: $67,380
  Manufacturing: $71,930

Mechanical Engineering Employment Outlook

- Mechanical engineer employment is projected to grow about as fast as the average for all non-engineering occupations though 2015. Employment of mechanical engineers in manufacturing should increase more rapidly as the demand for improved machinery and machine tools grows and industrial machinery and processes become increasingly complex. Also, emerging technologies in IT, biotechnology, and nanotechnology will continue to create new mechanical engineer job opportunities.
- Employment in mechanical engineering for business and engineering services firms is expected to grow slightly faster than average - as companies increasingly outsource mechanical engineering functions. In addition to job openings from growth, many mechanical engineer openings should result from the need to replace workers who transfer to other occupations or leave the labor force.

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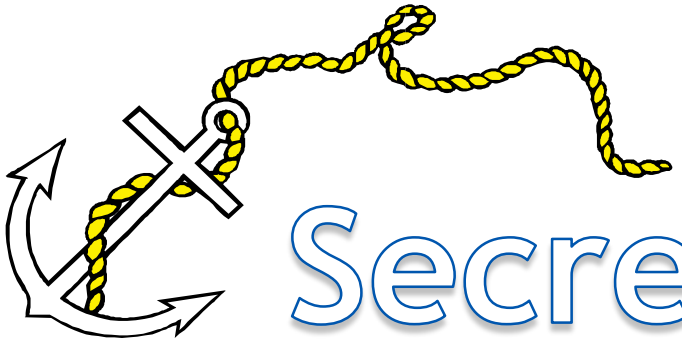

Secretary's Report

Nathan Callaghan

- Review minutes and action items from November 2010 meeting

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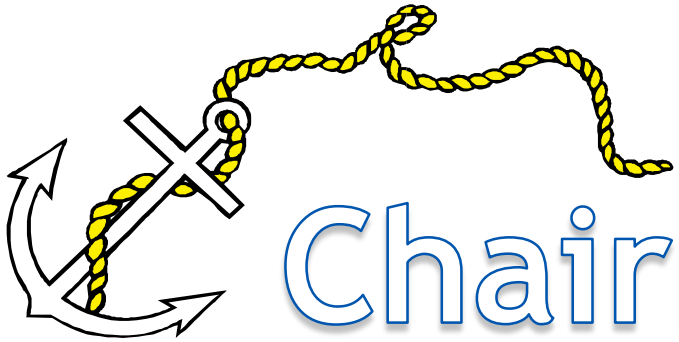

Chairman's Report

Fred Berg

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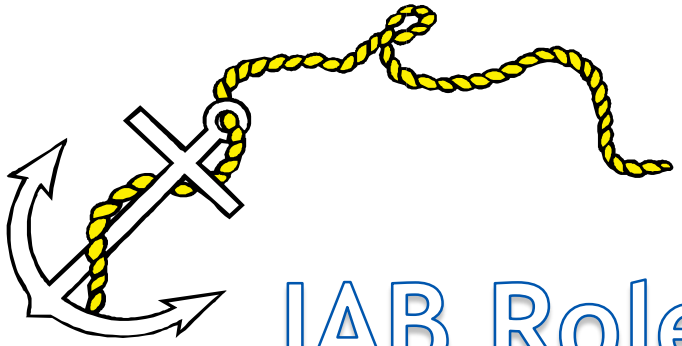

IAB Role Statement Review

Need the membership to either approve existing version of Role Statement or update it.

IAB Role Statement Review:

- The Industrial Advisory Board (IAB) is comprised of professional men and women in engineering positions who actively participate in the development of and the promotion of Lake Superior State University engineering and engineer technology programs, faculty members and students.
- IAB members guide, nurture and assure that the School of Engineering and Technology produces engineers with skills that will not only fulfill today's industrial needs, but will foresee the requirements of tomorrow in a global economy. IAB members provide "real time" interface with both faculty members and students bringing today's industrial technology to LSSU "today".

IAB Role Statement Review

IAB members are expected to:

- Evaluate and critique engineering programs by providing professional experience and direction.
- Be able to provide technical support such as, teaching materials, information on equipment, donate equipment, funding.
- Promote LSSU engineering curriculum to young people by participating in regional recruitment seminars and invite students for industrial tours.
- Attend IAB meeting.
- Support the senior project program with ideas or equipment and/or materials.
- Encourage professional development of the faculty by providing summer employment and sponsoring sabbaticals.
- Provide assistance with job placement for students both full-time and summer internships.
- Participate on subcommittees.
- Vote during IAB meetings on issues relative to the Role Statement.

Approve or Update?

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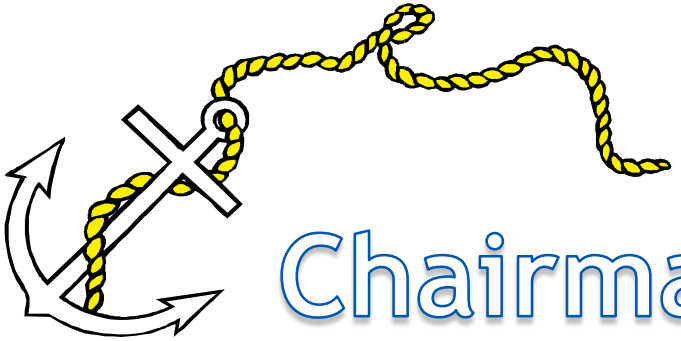


Chairman Election

Need the membership to vote for a Chairman
to serve as the IAB Chair for the next two years

IAB Chairperson Responsibilities and Term Limits

- It is the Chairman's responsibility to oversee all of the activities of the IAB including coordinating committees.
- As the need arises, the Chairman shall appoint committee chairpersons.
- The Chairman is an ex-officio member of all committees and is eventually responsible for the completion of all committee business. He/She shall keep in touch with all committee chairs, facilitate the completion of their task, and if necessary, remove inactive committee chairs/members and appoint successors.
- The Chairman is directly responsible for the IAB meetings.
- Meeting Responsibilities include:
  - Establish meeting dates, locations and times (coordinate with Dean of Engineering)
  - Arrange meeting facility
  - Finalizing meeting agendas
  - Presiding over meeting

IAB Chairperson Responsibilities and Term Limits

TERM LIMITS

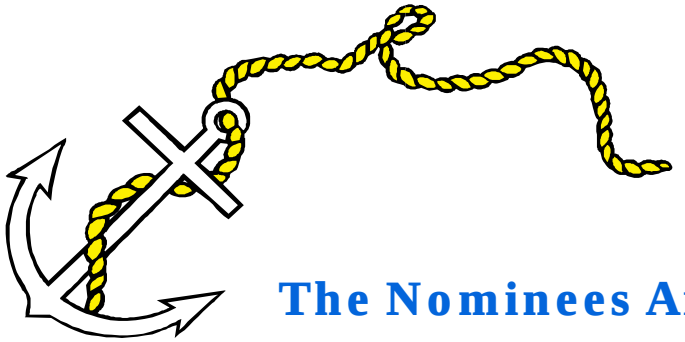
- The term of each office shall be two calendar years.
- The terms of Chairman and Secretary shall expire on alternate years.
- No more than 2 consecutive terms are allowed.
- There is no limit to the number of non-consecutive terms.
- Election shall be by a majority of the members present at the spring meeting.
- The term shall pass to the successors at the end of the spring meeting.
- Communication of all necessary information is the responsibility of the exiting officer.

Comments:

- The smooth operation of this small organization will depend on communication.
- Forms of correspondence:
  - Phone
  - Fax
  - E-mail
  - Letters
- To facilitate hand-offs, a format should be consented upon for electronic applications (e.g. IBM/DOS).

Nomination Process

- Any existing IAB members are eligible
- Self nominations are acceptable
- If you are nominating another member please be sure that they are willing to participate
- All nominations will be accepted and presented at the spring IAB meeting
- Any Questions: you can contact the existing IAB offices.



Congratulations go to
Nathan who was elected chair and to
Steven who was elected secretary!

The Nominees Are:

- Nathan Callaghan
- Steven Kars
- _____
- _____

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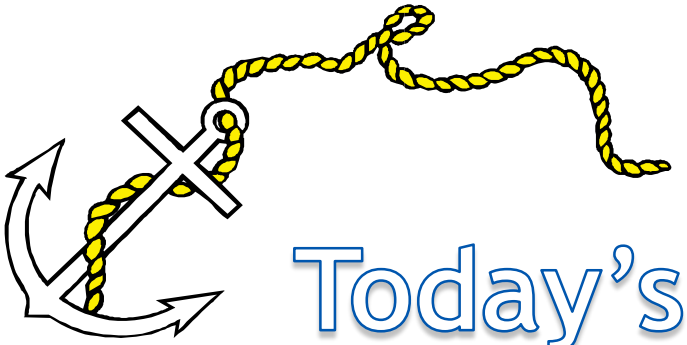

Today's Visitors

Adil Shafi
President, Advenovation Inc.

John Tillotson
Fellow Engineer, Honeywell

Trevor Swenson
Infrastructure Engineer, Research in Motion

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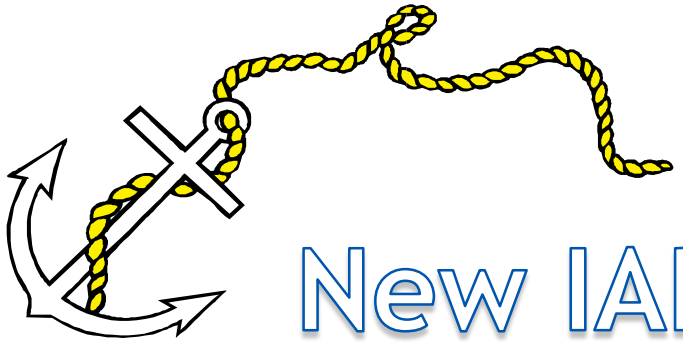

New IAB Candidate

Adil Shafi

- Need the membership to either approve or disapprove
- Send back for further review

NEW CANDIDATE TO THE IAB

Name	Adil Shafi
Company	ADVENOVATION, Inc.
Address	7517 Radcliffe, Brighton, MI 48114
Email : Website	adil@advenovation.com, www.advenovation.com
Phone	Home (810) 844 – 0996, Work (734) 516 – 6761
Title	President
Professional Member	Robot Industries Association (RIA)
	Automated Imaging Association (AIA)
	Motion Control Association (MCA)
Work Experience	22+ Years in Industrial Automation, Robotics and Vision Innovation

List some professional volunteer activities or affiliations

1. Editorial Committee	Robot Industries Association
2. Education Committee	Robot Industries Association
3. Served on Board of Directors	Automated Imaging Association
4. Served on Planning Committee	International Robots and Vision Shows
5. Served on Planning Committee	Automate 2011 Show, Vision Guidance Workshops

List some non work related / community volunteer activities or affiliations

1. Primary non-work activity	Time with family (wife and two children)
2. Member of Parishes	Our Lady of Good Counsel, St. Mary Magdalen
3. Physical Activities	Walking, Swimming, Downhill Skiing, Golf, Squash

Knowledge of Michigan Tech and experience / interaction over 30 years

Earned BSEE, BSCS, MSCS Degrees, College of Engineering, College of Sciences & Arts, School of Business, School of Technology, 10+ Clubs and Organizations (Blue Key, Omicron Delta Kappa, IEEE, ACS, Model United Nations, International Club, Lode Newspaper, Michigan Tech Student Foundation, Ski Club, Cricket Club, Squash Club), Michigan Tech Fund, accounting models, International (student and admin levels), Treasurer of Alumni Association, Alumni Email, Graduate School, Council of Graduate Schools, Boards / Committees (College of Sciences and Arts Co Chair, College of Engineering MEEM Department, Computer Science, Enterprise Development, Email Development, Information Technology, Portals, Michigan Tech Fund, Entrepreneur Alumni, Graduate School / CGS), personal relationships in many parts of the university, Departments (MEEM, Computer Science, Electrical Engineering, Humanities, Physics, Math, KRC, Information Technology, Summer Youth Program, Youth Expo), interaction with Enterprises and Senior Design, Alumni Chapters (US and overseas), Administration (Office of President, Governement Affairs, Corporate and Alumni Advancement, Advanced Technology Development Center, Admissions, International Advancement, Career Center, Alumni Office, Reseach (Ray Decker, Sung Lee, David Reed), familiarity with Advancement Officers), LDFA.

Knowledge of educational institutions and / or interaction and relationships

Lake Superior State University (Visits, Software Donation), MIT (UPOP Program for undergraduates, Agelab, Mars Lab, Volpe Center, CSAIL), Stanford (Gates Center), Purdue (RVL Robot Vision Lab), Carnegie Mellon (Robotics Institute), Cornell University, University of California Berkeley, University of Michigan, Northwestern University (Rehabilitation Institute of Chicago and Small Motor Performance Program), Fraunhofer Institute in Germany (Bin Picking, Efforts with IFR: International Federation of Robotics), University of Tokyo (INK Lab), Waseda University (Sugano Lab), Indian Institutes of Technology (15), Birla Institute of Technology, Benares Hindu University in India, Beijing University in China, National Chung Hsing University in Taiwan, UPM Saudi Arabia, METU Turkey, University of Hawaii, Pinckney High School (Competition Judging), Virginia Tech, Kent State University (Computer Science), Georgia Tech (Robotics), Mott Community College, University of Chicago (Illinois), Bay Noc College Escanaba, Oakland University, Northern Illinois University, Washtenaw Community College, Southwest Research Institute, University of Windsor.

Nomination approved:

Welcome Adil!

Knowledge, relationships and interaction at State and Federal Levels

Letters of support from Governor of Michigan and President of MEDC. Knowledge of UPEDA, LDFA, Michigan Congressional Delegation (Offices of Senator Levin and Senator Stabenow, Congressman Stupak and their local representatives in the UP / Houghton), House Armed Services Committee, Senate Armed Services Committee, TARDEC, TACOM, NSF, NIST, Department of Transportation, Volpe Center and Agelab at MIT, USAID and Commerce Department procedures and practices. Companies operating in defense + mobile military robotics and next generation innovation. Working with National Institute of Standards (NIST) in group charged with writing next generation of vision performance evaluation standards.

Personal Experiences and Traits

TRAVEL : About 40 countries and 50 US states, DC and Puerto Rico, Understanding and familiarity with key regions in the USA (MIT/Harvard, Manhattan (business, diplomatic, cultural, tourist), Silicon Valley (companies, events, venues, history, players, MTU alumni base), Chicago (industrial, medical), Detroit (automotive), Texas (military, medical, computer Compaq, Dell), Upper Peninsula (MTU, LSSU, NMU, Bay College key innovation companies), Seattle/Vancouver (Microsoft, Chinese and Korean business development, MSRS initiative), Canadian innovation, Southern German automation which leads in Europe, manufacturing in Italy (automotive, consumer), Spain (automotive), France (automotive) and key companies, Scandinavian trends in Finland, Sweden, Denmark, Norway. Languages (Fluent English, Fluent Hindi / Urdu and travel passable Chinese, Japanese, French, German, Spanish).

INNOVATION : Wrote program to solve any Rubik's cube, 1983 Library of Congress Copyright, world leading Bin Picking innovation in recent years : #1 ranking in the world above all other universities and companies for 3+ years, presently preparing to apply for Guinness World Record for highest average score in computer game Bubble Breaker.

EDUCATION : Taught precalculus at Michigan Tech. Personal experience in developing training courses and delivering them for more than 20 years.

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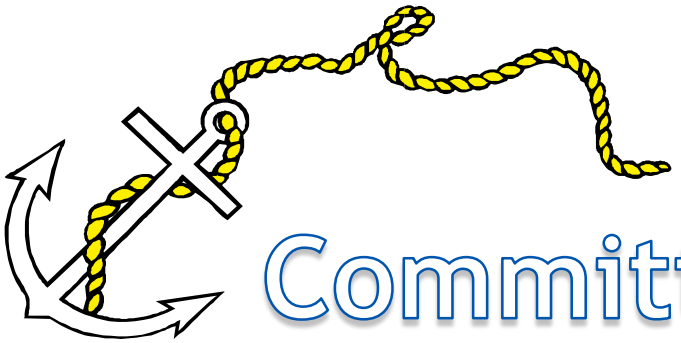

Committee Reports

Recruiting / MACRAO Events

Chris Conklin

IAB Admissions Support

- **LSSU Admissions and the IAB continue to work very well together.**
- Participation in and support for the 2011 Spring MACRAO events and Admitted Students Receptions across the state.

IAB MACRAO Participants Spring 2011

- **Diane Haig:**
  03/07/11: Marion HS
- **Bob Andersen:**
  03/15/11: Romeo Engineering and Technology Center
- **Brian Theriault:**
  03/16/11: Gaylord HS
- **Ralph Larsen:**
  03/17/11: Charlevoix HS
- **Chris Conklin:**
  04/15/11: Mid Michigan Community College

IAB Admitted Students Reception Participants Spring 2011

- **Chris Conklin:** 02/28/11: Midland
- **Lynnette Eding:** 03/03/11: Grand Rapids

Both receptions were very well attended by admitted students and parents.

Highlights

- MACRAO events continue to be well organized and many students are now being bussed to these events by their schools.
- MACRAO events remain **regionally focused**.
- Highlight Sheets are a popular handout.
- Summer Camps are a high interest area.
- March 2011 MACRAO events attended had strong engineering and technology interests.

Lowlights

- Laptop less of a tool, no interest.
- Little to no interest in the Recruiting/Press Kit.
- Fewer potential Engineering and Technology students at MACRAO events.
- LSSU is still a major unknown in the field of engineering and technology.
- April 2011 MACRAO event attended had no engineering or technology queries or interest.

Thoughts/Sharing

- Loss of interest in the Recruiting/Press Kit this year.
  Need a different format or different approach?
- Loss of interest in laptop PC presentations.
  Need a different format or different approach?

...in closing

- We all enjoy supporting these events, it is a rewarding experience to be able to provide information that may be used in a student's decision making process for their educational and career choices.
- The Fall 2011 MACRAO events are not yet scheduled. During the summer as this calendar is firmed up and posted, I will again send an email soliciting your support.

THANK YOU

- A special **THANK YOU** to all of the IAB membership who supported the Spring 2011 MACRAO events and Admitted Student Receptions. Your support is greatly appreciated and I hope that we can continue to support future events.
- IAB participation in **MACRAO** events and **Admitted Student Receptions** is a very **UNIQUE** and **POSITIVE INFLUENCE** on student choice.

LAKE SUPERIOR STATE UNIVERSITY

Lake Superior State University Updates

- **College of Engineering, Technology & Economic Development**
- **School of Engineering & Technology**
- **Programs:**
  - Mechanical Engineering & Manufacturing Engineering Technology and ABET Visit
  - Computer & Electrical Engineering

LAKE SUPERIOR STATE UNIVERSITY

College of Engineering, Technology & Economic Development

Eric Becks & David Leach

- Product Development Center
- SSMart Zone
- Laker Technologies, Inc.


LSSU
PDC
PRODUCT
DEVELOPMENT
CENTER


SSMART
SM
Sault Ste. Marie Advanced Resources & Technology, Inc.


AKER ECHNOLOGIES

PDC Overview

- PDC Activites
- SSMart^{SM}, Inc. – SmartZone^{SM}
- Laker Technologies, L3C
- Request for Projects

LSSU PDC PRODUCT DEVELOPMENT CENTER

PDC Activities

- Marble Arms Automation
- Skate Fenders
- Medical
- Veterinary
- Other
- Administer SSMart

LSSU PDC PRODUCT DEVELOPMENT CENTER

SSMart, Inc.

Sault Ste. Marie advanced resources and technologies

- Administered by PDC under contract
- Breeder Building Designed
- Construction Soon
- AUTOMATE Show
- Seeking Startups

SSMART℠

Sault Ste. Marie Advanced Resources & Technology, Inc.

Laker Technologies, L3C

- Low-profit Limited Liability Company
- Board from
  - Engineering
  - Business
  - Computer Science
- Turn-key Web/Marketing Services
  - Server Equipment Grant Request
- Outlet for New Products

LAKE SUPERIOR STATE UNIVERSITY

School Updates

Ron DeLap

Hired: Joseph P. (Joe) Moening

Ph.D. – University of Toledo “the Rockets!”

Dissertation was related to solar cells

Familiar with the U.P.

Fits in well with our “family”

Dr. Joseph Moening

School of Engineering & Technology

PROMOTIONS!

Dr. Robert Hildebrand, from Assistant to Associate Professor

Dr. Andrew Jones, from Assistant to Associate Professor

CONGRATS!

School of Engineering & Technology

Sabbatical!

David McDonald, Awarded 1-year sabbatical!

CONGRATS!

School of Engineering & Technology

Clubs

- ASME

  Competed in H2Go competition at Grand Valley
  First Place!!

- SAE

  A year of rebuilding. Competition should resume next year.

- SWE

  Great community PR – Girl scout events.

- IEEE

  Another positive year; FRC 1596 Instigators made state finals.

School of Engineering & Technology

From Fall report: Enrollment numbers – UP.

Enrollment distribution – spreading

Significant gains in Grand Rapids

Significant gains in out of state recruitment

Trends are all looking positive for Engineering

School of Engineering & Technology

Since Fall Report (187 students):

Left Engineering - 17

Graduated – 3

Additional Gains - 10

Primary reasons for leaving:

Difficulty with coursework.

Lost interest in engineering

School of Engineering & Technology

Enrollment

Fall	Spring	Delta
• 06: **194** Students	07: 174	10%
• 07: **176** Students	08: 161	8.5%
• 08: **175** Students	09: 165	5.7%
• 09: **172** Students	10: 165	4.1%
• 10: **187** Students	11: 177	5.3%
• Fall 11: ??		

- 32 “new students” signed up for orientation at present – need more!

School of Engineering & Technology

Enrollment

- Fall 10: **187** Students
  Spring 11: 177 Students

- RETENTION – 17 students left at the break
  - Retention rate = 91% overall
  - Freshman retention rate = 87%
  - These are phenomenal numbers!

Graduation - Jobs

- One of our best years ever!
  - 25 Grads, 70+ job offers.
  - Salaries moving up.
  - VERY POSITIVE Employer and Alumni Feedback

School of Engineering & Technology

Plans of your new Dean:

Recruiting, Recruiting, Recruiting!!! – Check.

Alternative Energy Minor – In progress

Co-op's and Internships – In slow progress

Fundraising – Has not progressed

Business/Engineering Partnerships – some progress

Two KEY GOALS!

Keep our **freshmen** happy, and challenged (retain our gains). Check

Graduate seniors that are well prepared, and happy, on time (our future recruiters) This seems to be the case this year!! Why?

School of Engineering & Technology

Recruiting, Recruiting, Recruiting!!!!

Plans: Evaluate current methods

Keep what's best, lose the rest

Pursue new recruiting methods

- Targeted recruiting
- Student input
- Constant Contact
- Be relevant, be personal

School of Engineering & Technology

Ongoing and new plans:

Open a new center for entrepreneurship (Eric's talk)

- Continuing to work on this
- Sault Smart Zone is on board

Open an Engineering House

- 9 students to start
- Currently have 3 upper class signed up
- 18 Freshmen apps

School of Engineering & Technology

What the IAB can do to help the Engineering Program:

Identify and lobby people of influence in Lansing

Continue to ***aggressively*** recruit potential students

$upport the Product Development Center

$upport our scholarship programs and our Entrepreneurial Center

Support Senior Projects

Hire and promote our graduates

Know what is special about our engineering program!
Visit our web site.

We Are ***Unique***, and We Produce ***GREAT Engineers***.

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Program Updates

- **LSSU Robotics Center**
  Ron DeLap
- **Mechanical Engineering & Manufacturing Engineering Technology and ABET Visit**
  Robert Hildebrand
- **Computer & Electrical Engineering**
  David Baumann

School of Engineering & Technology

LSSU Robotics Center

No major initiatives this year, but Jim has been very active.

- RIA – board
- Automate Conference, Chicago
- Multiple Papers
- National level Webinars
- EOS Senior Project

Summer Camps – hundreds of apps for 64 slots. Wow!

School of Engineering & Technology

Mechanical Engineering/ Manufacturing Engineering Technology

- Only minor ME curriculum changes (prerequisites, etc.)
- Only small lab equipment acquisitions (e.g., camera integral to microscope)
- Started ME curriculum comparison (Note David B's data). (benchmarking other Schools) -- updates at fall meeting
- Contemplating a Thermodynamics/Fluid Lab course (1 credit)

ABET visit for MfgET program

- Will definitely reaccredit – no interim visit likely
- No major findings ("weaknesses" or "deficiencies") – only a few lower-level findings ("concerns"):
  some older equipment & texts,
  continuous improvement practices
  (not convincingly demonstrated)

BUT!
Post inspection, one concern became a weakness!
We have vigorously contested this.

Survey

Please help us comply with our ABET criteria and complete an **Evaluation of Educational Preparation of Employees** survey. We are collecting materials during the 2011-12 academic year for the CE, EE and ME programs. EAC of ABET will visit during Fall 2012.

Thank you!

The Survey can be found on the IAB web page under "resources".

Electrical & Computer Engineering FORECAST

David Baumann

- EE Curricular Comparison (FYI)
- CE Curricular Comparison (FYI)
- Sustainable Energy Option (FYI)
- Ideas for Lab Changes (IAB input)
- Ideas for EE Curricular Changes (IAB input)
- Ideas for CE Curricular Changes (IAB input)

Electrical and Computer Engineering

EE Curricular Comparison

- Compared EE Core Courses with:
  - Lawrence Technological University
  - Michigan State University
  - Michigan Technological University
  - Rose-Hulman University
  - Saginaw Valley State University
  - University of Michigan
  - University of Toledo
  - University of Wisconsin – Platteville
  - Western Michigan University

Electrical and Computer Engineering
EE Curricular Comparison

Major Findings

- We are one of only three institutions to have a Numerical Methods course.
- We are one of only two institutions to have two Control Systems courses and the only one to have two Control Systems labs.
- We are the only institution to have a Probability and Statistics lab.
- We have 13 lab credits compared to an average of 5.7 lab credits. Lawrence Tech is the closest to us with 10 lab credits.

Electrical and Computer Engineering

CE Curricular Comparison

Compared CE Core Courses with:

- Lawrence Technological University
- Michigan State University
- Michigan Technological University
- Rose-Hulman University
- University of Michigan
- University of Toledo
- Western Michigan University

Electrical and Computer Engineering
CE Curricular Comparisons

- Major Findings
  - We are one of only three institutions to have a Numerical Methods course.
  - We are one of only three institutions to have a DSP course and the only institution with a DSP lab.
  - We are the only institution to have a Probability and Statistics lab.
  - We are one of only three institutions to have a Computer Networks course.

(continued)

Electrical and Computer Engineering

CE Curricular Comparison

Major Findings *(continued)*

- We are one of only two institutions not to have a Computer Organization/Architecture course.
- We are one of only three institutions not to have an Operating Systems course.
- We have 13 lab credits compared to an average of 5.8 lab credits. Lawrence Tech is the closest to us with 9 lab credits.

Electrical and Computer Engineering
Sustainable Energy Option

- Growth in General Power Field
  - New emphasis on “Smart Grid”
  - Many engineers in field nearing retirement
  - Demand for power continues to grow
- Growth in Sustainable/Renewable Energy
  - Wind
  - Photovoltaic Solar
  - Hydrogen Fuel
  - Thermal Solar

Electrical and Computer Engineering
Sustainable Energy Option

- National Model (Result of NSF Grant)
  - Electric Drive Course
  - Power Electronics Course
  - Electrical Power Transmission Course
  - Sustainable/Renewable Energy Course
- Additional LSSU Course
  - Electrical Vehicle Systems

Electrical and Computer Engineering

Ideas for Reducing Labs

- Killing of Labs
  - EGEE-280 Intro to Signal Process (3,3) → (3,0) or (4,0)
  - EGEE-425 DSP (2,2) → (3,0)
- More Killing of Labs
  - EGNR-346 Prob and Stats Lab (0,2) → Eliminate
  - EGRS-461 Design of Control Systems (3,3) → (4,0)
- Removal of Labs from Curricula
  - EGNR-340 Adv Num Meth (0,2) → Out of CE, EE Cores

Electrical and Computer Engineering

Ideas for EE Curriculum

- Changes to EE Core
  - EGEM-220 Statics (3,0)
    replaced by EGEM-220 Statics (3,0)
    or EGEM-377 Thermodynamics (3,0)
  - Kill EGEE-375 Electronic Devices (modify and change to EGEE-475 so we can offer four course options)
- V~~ehicle Systems Option~~ {Cancel-have not had any students}
- ~~Electrical/Mechanical Option~~ {Cancel-few students if any}

(continued)

Electrical and Computer Engineering

Ideas for EE Curriculum

- Robotics and Automation Option (14 credits)
  - EGRS-365 PLCs (2,3) {NEW}
  - EGRS-385 Robotics Engineering (3,3)
  - EGRS-430 Sys Integration and Machine Vision (3,3)
  - EGRS-435 Automated Manufacturing Systems (2,3)
- Digital Systems Option (14 credits)
  - EGEE-320 Digital Design (3,3)
  - EGEE-355 Microcontroller Systems (3,3)
  - EGRS-425 Digital Signal Processing (3,0)
  - Technical Elective {NEW}

Electrical and Computer Engineering

Ideas for EE Curriculum

- Sustainable Energy Option (13 credits)
  - EGEE-311 Power Distrib and Trans (3,0) {New}
  - EGEE-361 Energy Sys and Sustainability (2,2) {Newish}
  - EGEE-362 Electric Vehicle Systems (2,3) {Newish}
  - EGEE-475 Power Electronics (3,3) {Altered EGEE-375}

Electrical and Computer Engineering

Ideas for CE Curriculum

- Changes to CE Core

  CSCI-201 Data Structures and Algorithms (3,0) or
  CSCI-221 Computer Networks (2,2)

  replaced by

  CSCI-201 Data Structures and Algorithms (3,0) or
  CSCI-315 Computer Org and Architecture (3,0) or
  CSCI-334 Operating Systems Concepts (3,0)

(continued)

Electrical and Computer Engineering

Ideas for CE Curriculum

- Robotics and Automation Option (11 credits)
  - EGRS-385 Robotics Engineering (3,3)
  - EGRS-430 Sys Integration and Machine Vision (3,3)
  - EGRS-435 Automated Manufacturing Systems (2,3)
- Control Systems Option (11 credits)
  - EGEE-320 Digital Design (3,3)
  - EGEE-355 Microcontroller Systems (3,3)
  - EGRS-425 Digital Signal Processing (3,0)

Electrical and Computer Engineering

Ideas for CE Curriculum

- Sustainable Energy Option (9-10 credits)
  - EGEE-361 Energy Systems and Sustainability (2,2)
  - EGEE-362 Electric Vehicle Systems (2,3)
  - One course from:
    - EGEE-311 Power Distribution and Trans (3,0)
    - EGEE-330 Electro-Mechanical Systems (3,3)
    - EGEE-475 Power Electronics (3,3)

LAKE SUPERIOR STATE UNIVERSITY

Senior Projects

Ron DeLap

- 2010-11 Senior Project Evaluations
  Form Overview
- 2011-12 Senior Project Proposals
  Discussion

See brochures for schedule and demonstration locations.

Brochure available on IAB web page under "Spring 2011 meeting".

Presentations will all take place in CASET 212. Events begin on the half hour.

CURRENT PROJECTS

2010-11 Senior Year Projects

- **Industry Sponsored Projects (4)**
- **Vermilion Foundation Sponsored Project (1)**

- **THIS YEAR'S GOAL:**
  - ***Graded Final Presentations*** **by First Week in April.**
    - **Did not happen, but…..**

Team Innovative Solar Solutions

- Customer: 3M
- FA: Dr. Paul Weber
- Goal: Implement a solar power system using proprietary 3M materials
- Budget: ~ $12K
- Outcome: Proof of concept for new solar material

Status: Complete, some final testing in progress

Vermilion Innovation Providers of Energy Research Solutions

Goals:

- Install weather station
- Establish communication link
- Research energy sustainability for site
- Propose future plan of action
- Present research at conference
- Status: Complete

Members:

Eric Hoxie (EE)
Jameson Mattice (EE)
Brad Ekin (EE)
Ben Martin (ME)
John Preczewski (EE)

Dr. Andrew Jones (FA)
Mr. Charles Dawley (IC)

Budget: $6000

Team Steering Innovations

Manual lever operated column

Steering Column Adjustment Button (Our Project)

Power operated (pushbutton) column

- Customer: Nexteer Automotive
- IC: Fred Berg
- FA: David McDonald
- Goal: Optimize Nexteer's Prototype
- Budget: $10K
- Outcome: Functioning Prototype in Buick LeSabre
- Status: Complete

Thanks Fred!

Team Robotic Simulation Services

Sponsor: EOS

The team is assigned a task to create a set of fully functional virtual demonstrations for EOS that can be used to exhibit the Virtual Commissioning Solutions of Dassault and Siemens to potential customers.

EOS has provided the required software and hardware to the team to successfully complete the project.

Status: Complete

DASSAULT SYSTEMES

SIEMENS

PROTOTECH

Team ProtoTech

Customer: LSSU Prototype Development Center

Members: 2 MfgET, 1 ME, 1 EE

Advisor: Dr.Hildebrand

Team Prototech served as an adjunct to LSSU's Product Development Center, tasked with the design, prototyping, testing, and optimization of new products proposed by industry and entrepreneurs. It completed a series of new product development projects during the academic year, beginning with an innovative instrumentation project with applications in veterinary medicine (now largely complete) and followed that with a hand-held power tool application.

STATUS: Complete

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We have a GREAT Engineering Program!

We Produce GREAT Engineers!

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Closing

- Remarks
- Next Meeting: proposed IAB host location – Gaylord
- Lunch: Anchor Room – Meet our outstanding & notable seniors
- Senior project presentations & demonstrations begin at 1 p.m.