

The School of Engineering and Technology comprises the following disciplines:

- Computer Engineering
- Electrical Engineering
- Electrical Engineering Technology
- Engineering Management
- Industrial Technology
- Manufacturing Engineering Technology
- Mechanical Engineering

All of the senior engineering and engineering technology bachelor's students at Lake Superior State University are required to complete a challenging senior design project.

The students work in multidisciplinary teams and use a composite of their technical and general education courses to successfully complete these projects.

The intention of the senior design project is to provide valuable engineering experience that will help the team members transition well from academia to industry or graduate school. Each project requires a detailed technical engineering analysis, development and follow-through to provide a realistic experience for our graduates. Projects are typically industrial in nature. Some allow for opportunities to break ground and be a part of a new process or product warranting a patent. Others provide opportunities for presentations at conferences and/or competition participation.

Students work with timelines, monetary and management issues, communication, teamwork, paperwork, and logistics within their teams. In addition, they handle guidelines, design reviews, development and production issues, purchasing, changing project definitions, and lessons learned as they work with their faculty advisors and industrial customers.

The LSSU Product Development Center (PDC) is an extension of the College of Engineering, Technology and Economic Development. It provides the necessary engineering design tools, engineering staff, materials analysis, product packaging guidance, software development and other similar services leading to the development or testing of a functioning prototype to meet the needs of the Michigan Economic Development Center, the Michigan Small Business Technology and Development Center, and small businesses and entrepreneurs of Michigan while providing opportunities for students to obtain experience on actual design projects.

www.lssu.edu/pdc

Welcome to the Engineering Senior Project Presentations & Demonstrations

Presentations are held in CASET 212

1:00 p.m.

Presentation: Team CH

1:30 p.m.

Presentation: Team RDP
Demonstration: Team CH in CASET 122

2:00 p.m.

Presentation: Team ISI
Demonstration: Team RDP in CASET 125

2:30 p.m.

Presentation: Team OIL
Demonstration: Team ISI in CASET 122

3:00 p.m.

Presentation: Team AI
Demonstration: Team OIL in CASET 120

3:30 p.m.

Demonstration: Team AI in CASET 125

Students will be available throughout the afternoon for informal demonstrations and questions.

2011-12 Senior Projects Faculty Board Members

This group serves as advisors, overseers, and guides to help the teams through their overall processes:

Jon Coullard, Jim Devaprasad (chair),
Robert Hildebrand, Jeff King, and Paul Weber

Special thanks to Laura Bofinger and Jeanne Shibley



*For more information about LSSU's
School of Engineering & Technology,
contact the office at 906-635-2207.*

  www.lssu.edu/eng



The School of Engineering & Technology

presents the

Class of 2012 Senior Design Project Presentations & Demonstrations



A concentrated photovoltaic array is one of two senior projects that underwent redevelopment in 2011-12.

Friday • April 27, 2012

1:00 p.m. - 4:00 p.m.

in the

**Center for Applied Science
and Engineering Technology**



Project: Automated Robotic Work Cell

Team Members: Jordan Gignac, Josh Laplander, Zach Lynch, Scott Martin, and Ryan Tingle

Faculty Advisor: Mr. Jeff King

Project Sponsor: LSSU Engineering

Industrial Customer Contact: Prof. Jim Devaprasad

Presentation: 3:00 p.m., CASET 212

Demonstration: 3:30 p.m., CASET 125

Team Automation & Integration (AI) designed and built a workcell to showcase the various robotic and automation technologies for academic and industrial audiences. It integrates a robotic arm, vision system and conveyor system. There are two applications to the workcell. First is a vending application which accepts a user-defined product for the machine vision to identify, allowing the robotic arm to retrieve it from the conveyor system and place it in a chute for the user. Second is a portrait drawing application which will take a snapshot of a person and translate the data into the necessary outlines allowing the robot to draw a picture.

Concept Hydraulic



Project: Hydraulic Hose Reel Kit

Team Members: Henry Aimila, David Grasc, and Chad Leask

Faculty Advisor: Dr. Robert Hildebrand

Project Sponsor: Superior Fabrication

Industrial Customer Contact: Mr. Ian Moore

Presentation: 1:00 p.m., CASET 212

Demonstration: 1:30 p.m., CASET 125

Team CH designed a hose reel kit for forklifts which has the universality to be either single function (two hoses) or dual function (four hoses), and left-handed or right-handed mounting. The design involved a modular system that utilizes a minimal number of parts to achieve single or twin functionality. Further, the design was analyzed using finite element analysis (FEA) and fluid dynamics software, as well as cycle testing of a prototype using Superior Fabrication's test platform.



Project: Concentrated Photovoltaic Module

Team Members: Justin Lacroix, Edoardo Sarda, and Brad Starks

Faculty Advisor: Dr. Paul Weber

Project Sponsor: 3M

Industrial Customer Contact: Mr. Tim Hebrink

Presentation: 2:00 p.m., CASET 212

Demonstration: 2:30 p.m., CASET 122

Team ISI redesigned, built, and tested a concentrated photovoltaic (CPV) array based on 2010-11 Team Innovative Solar Solutions' system team using 3M Brand Cool Mirror Film. The updated system combines standard solar panels with articulated mirror panels to increase the concentration of sunlight on the solar panels. It allows the system to produce the same amount of power as a standard array, using significantly fewer solar panels. The more cost effective and lighter weight design uses 3M antireflective coating to increase solar input, reduces control power consumption, and will demonstrate the viability of 3M Brand Cool Mirror Film in CPV applications.



Project: Mini-Baja Race Vehicle

Team Members: Theodore Dilworth, Nick Fitzpatrick, and Ben Hessel

Faculty Advisor: Mr. Jon Coullard

Project Sponsor: LSSU Engineering

Industrial Customer Contact: Mr. Paul Duesing

Presentation: 2:30 p.m., CASET 212

Demonstration: 3:00 p.m., CASET 122

Team OIL redesigned, remanufactured and tested the LSSU vehicle built by 2008-09 senior project team Race Tech Innovations. Efforts were focused on correcting the front steering geometry, weight reduction, improving ergonomics, and remanufacturing the final drive CV hub, and satisfy the rigorous specifications and criteria set by the Society of Automotive Engineers (SAE). The renovated vehicle will compete in the SAE Baja Mid-West Competition in Burlington, Wisc. on June 7-10, 2012.

High-resolutions scans of the interior of Sault Ste. Marie's 92-year-old museum ship, the Valley Camp, were used to create a virtual model and a template from which maintenance plans for ships can be developed.



Project: Virtual Maintenance Planning for Commercial Ships

Team Members: Matt Caccamo, Tim Gallaway, and Josh Korman

Faculty Advisor: Prof. Jim Devaprasad

Project Sponsor: EOS

Industrial Customer Contact: Mr. Brent Kemmer II

Presentation: 1:30 p.m., CASET 212

Demonstration: 2:00 p.m., CASET 125



Team RDP developed a process for efficiently planning maintenance procedures on large commercial ships through a collaboration with EOS. The plan was developed based on a virtual model created from high resolution scans of the Valley Camp Museum Ship in Sault Ste. Marie, Mich. The process was achieved by using four software packages in four phases that began with the scans. RDP then developed an industrial analog and maintenance planning process that EOS will use as a template for planning future maintenance projects.