1:00 pm — Team IRC

Team Members: Sean Bellows (RE), Beau LaTulip (RE), Jameson McKnight (ME & RE), William Peltier (Mech), Maddie Whip (ME & RE)

Faculty Advisor: Dr. Edoardo Sarda **Company:** LSSU **Project Contacts:** Prof. Jim Devaprasad

Project Description: Team IRC (Integration of Rotary Cobots) has transformed the LSSU Robotics Lab by integrating four new FANUC CRX collaborative robots into a fully revamped rotary line. Through an engaging mocktail demonstration, this project showcases the capabilities of LSSU's rotary line and serves as a showpiece for visitors of LSSU's robotics lab. Further, through user-friendly tutorials and hands-on lab exercises, students will discover the role of collaborative robotics within the future of automation.

1:30 pm — Team UP-STREAM

Team Members: Brandon Buckmaster (MfgET), Lydia Knapp (ME & RE), Zeng Vue (EE), Sara Waltz (ME)

Faculty Advisor: Dr. Zakaria Mahmud **Company:** Pre-Tec (Eugene, OR) **Industrial Contacts:** Jeff Johnston, Rich Reardon, Kevin Danhof, Erik Finley

Project Description: Team UP-STREAM analyzed three different styles of air evacuation systems used in PRE-TEC's robotic spray booths. The team developed airflow simulations and scale models for each system, providing PRE-TEC with valuable tools for marketing and customer demonstrations. The project's ultimate goal was to identify the most effective evacuation method as supported by the data and visual evidence.

2:00 pm — Team SUAVE

Team Members: Clay Brown (RE), Cameron Cook (CE), Mitchell Gorney (RE), Lezan Koyuncu (ME), Riley Sponseller (RE)

Faculty Advisor: Prof. Jim Devaprasad **Company:** Mission Design & Automation (Holland, MI), LSSU **Industrial Contacts:** Justin Darga, Geno Peyerk, Steve Solack, Dr. Sarda

Project Description: Team Superior Unmanned Applications with Vision Engineering (SUAVE) has completed several major objectives towards revitalizing robotics at LSSU. These tasks have included 1) working closely with Mission Design & Automation to restore over $1M in past senior projects lost in the 2023 CAS fire, complete with new lab work for robotics students,, 2) using new 3DV vision systems donated by FANUC with both a new ceiling vision installation for the lab's CR-X 10iA rotary table and a new demo cart for the Automate conference in the spring, and 3.) refining the Hockey Slapshot System designed by last year's Team SSS.

2:30 pm — Team BET

Team Members: Reese Camp (ME), Wyatt Landerville (ME), Hunter Nowakowski (Mech), Eli Rondeau (ME)

Faculty Advisor: Dr. Robert Hildebrand **Company:** LSSU **Project Contacts:** Dan Goodrich, Daryl Mendrick

Project Description: Team BET (Baja Engineering Team) designed and built an updated Baja cart that incorporated an all wheel drive system. Our goal is to participate and be competitive at the Maryland SAE Baja event in June 2025. We have also met all of the new rules set by the SAE (Society of Automotive Engineers) from the most recent rules update. We did this by using an already existing drivetrain, designed by Team HEART in the 2022-2023 academic year, and added a new chassis, suspension, transmission, and frame. Our design was driven by simulation and parameter studies, similar to the process of development in the automotive industry.

3:00 pm — Team SVS

Team Members: Pascal Klimes (EE), Joseph Kramer (ME & RE), Benjamin Patrick (CE), Wyatt Zulski (CE)

Faculty Advisor: Prof. David Leach **Company:** JR Detroit (Auburn Hills, MI) **Industrial Contacts:** Lindsey Pajot

Project Description: Team SVS has developed a machine vision training cart for JR Detroit that will be used to train employees on fundamental and advanced principles of machine vision. Training modules have been developed to teach users in Matrox Design Assistant software for multiple processing methods. With all the modules completed, a user will have the theoretical background and practical experience to design camera, lighting, and filter setups for numerous applications on real projects.

3:30 pm — Team BAM

Team Members: Christopher Bohm (RE), Daniel Henderson (CE), Katherine Mendrick (ME & EE), Noah Murray (RE), Raul Velasco (ME & RE)

Faculty Advisor: Dr. Robert Hildebrand **Company:** LSSU **Project Contacts:** Dr. Edoardo Sarda, Chase Jannetta

Project Description: Team BAM (Bathymetric Autonomous Mapping) has designed a bathymetric mapping system using an Autonomous Surface Vehicle (ASV). This system incorporates an acoustic sensor suite for obstacle detection and path planning, along with a sonar system for data collection. The ASV is capable of generating bathymetric maps across various bodies of water at designated site locations, operating in both remote-controlled and autonomous modes.

CE: Computer Engineering, EE: Electrical Engineering, EET: Electrical Engineering Technology, ME: Mechanical Engineering, Mech: Mechatronics, MfgET: Manufacturing Engineering Technology, RE: Robotics Engineering

Senior Design Projects

All of the Lake Superior State University senior engineering and engineering technology bachelor's students are required to complete a challenging senior design project. The students work in multi-disciplinary teams and use a composite of their technical and general education courses to successfully complete these projects.

2024-25 Senior Projects Faculty Board

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

Masoud Zarepoor (Chair), Trevor Bryant, Jim Devaprasad, Robert Hildebrand, David Leach, Zakaria Mahmud, Edo Sarda

Special thanks to Rebecca Kilponen

The School of Engineering & Technology comprises:

- Computer Engineering
- Electrical Engineering
- Mechanical Engineering
- Robotics Engineering
- Electrical Eng. Technology
- Manufacturing Eng. Technology
- Mechatronics

Welcome to the School of Engineering & Technology

Presentation/Demonstration Schedule

Team IRC	***1:00 / 1:30 pm***
Team UP-STREAM	***1:30 / 2:00 pm***
Team SUAVE	***2:00 / 2:30 pm***
Team BET	***2:30 / 3:00 pm***
Team SVS	***3:00 / 3:30 pm***
TEAM BAM	***3:30 / 4:30 pm***

Presentations will be in CASET Room 212

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

For more information about LSSU's School of Engineering & Technology
www.lssu.edu/eng *or* 906-635-2207

LAKE SUPERIOR STATE UNIVERSITY

The School of Engineering & Technology

presents the

Class of 2025

Senior Design Project Presentations & Demonstrations

Friday May 2

1:00 – 5:00 PM

in the

Center for Applied Science and Engineering Technology

Presentations: lssu.zoom.us/j/98087034047
Demonstrations: lssu.zoom.us/j/93700786027