1:30 pm — **Team IPS**

Team Members: Ethan Brown (ME), Blake Feinauer (CE), Eli Fournier (EE), Riley Hoffman (MfgET), Muskaan Ranjan (ME), Kyle Robinson (ME)
Faculty Advisor: Dr. David Baumann **Company:** JR Automation (Auburn Hills, MI) **Industrial Contacts:** Mark Compton

Project Description: Team IPS is tasked with designing and building a custom large format 3D printer that utilizes FDM technology. The build volume of the printer is expected to be approximately 500mm x 500mm x 400mm. This project will provide a printer with a faster build speed and provide an overall quality that meets or exceeds the specifications given by JR Automation.

2:00 pm — **Team KOS**

Team Members: Alex Retlich (ME, RE), Cameron Livingston (ME, RE), Austin Helm (ME), David Mitter Jr. (ME), Cade Canterbury (EE), Justin Willis (MfgET)
Faculty Advisor: Dr. Masoud Zarepoor **Company:** KUKA Robotics (Shelby Township, MI) **Industrial Contacts:** Michael Breen

Project Description: KOS is tasked to work with KUKA Robotics in developing a vision based palletizing and depalletizing workcell demonstration. This demonstration will include the complete development of a workcell consisting of vision systems, safety sensors, conveyor belts, and KUKA robots. In addition, other areas of the project include utilizing KUKA Sim to develop a workcell, determining the EOAT for palletizing and depalletizing, and developing additional software for robot peripheral communications.

2:30 pm — **Team SMART**

Team Members: Jacob Lipa (ME), Alvin Grant (ME), Collin Nielsen (MfgET), JD Schmidt (EET), Isaac Thompson (ME), Joseph Shaheen (ME)
Faculty Advisor: Dr. Zakaria Mahmud **Company:** Textron Aviation (Wichita, KS) **Industrial Contacts:** Chad Merten, Aaron Heath, and Lucas Burk

Project Description: Team SMART is tasked with designing and building a motorized re-spooling station for composite materials. Textron aviation uses composite materials that have a limited shelf life at over -10 F temperature. Currently, the materials are manually spooled onto an empty spool and stored in the freezer. Team SMART's innovative solution will reduce the overall cost and eliminate an extremely repetitive manual re-spooling task.

3:00 pm — **Team CAMRI**

Team Members: Mitchell Barron (ME, RE), Bobby Carpenter (MfgET), Keith Fischer (ME), Brandon Sarasin (ME, RE), Trevor Solander (ME)
Faculty Advisor: Prof. Jim Devaprasad **Company:** Lake Superior State University **Industrial Contacts:** Dr. Edoardo Sarda

Project Description: Team CAMRI used collaborative robots at LSSU to create intellectual lab projects for future students and exciting demonstrations for visitors. This was accomplished by joining MiR autonomous mobile robots and UR collaborative robot arms. These robots will be used for demonstrations on the ice rink at LSSU Hockey games, for delivery of products in fleet mode in the CAS building, and for lab projects in LSSU's Robotics Lab. This project will further expose current and prospective students to the cutting-edge technology LSSU Robotics has to offer.

3:30 pm — **Team STAC**

Team Members: Camren DeCaire (ME), Kendal Delpiere (ME), Samuel Hetzner (ME), Adam Powell (ME), Robert Prescott (ME), Ian Hudson (ME) Fall Only
Faculty Advisor: Dr. Robert Hildebrand **Company:** UTAC/Millbrook (Livonia, MI) **Industrial Contacts:** August Klotz

Project Description: The project from UTAC, is to design and build a prototype of a torque calibration system that will be able to measure in 10 step increments from 1,000 to 10,000 NM with an accuracy of up to 0.05%. The torque sensors that it will be calibrating are for dynamometers in the automotive industry. This torque calibrator will be used as a master calibrator at the UTAC facilities to eliminate the need of sending torque sensors out for external calibration.

4:00 pm — **Team AMORE**

Team Members: Taylor Lamorie (CE), Bradley Hacker (ME, RE), Shaede Perzanowski (ME, RE), Hannah Brood (ME, RE), Tom Muir (ME), Anthony Paradine (ME)
Faculty Advisor: Dr. Edoardo Sarda **Company:** RobotX (LSSU) **Industrial Contacts:** Dr. Karl von Ellenrieder, Mr. Mario Miranda, and Dr. Travis Moscicki

Project Description: Team AMORE developed a 16-foot-long unmanned surface vehicle (USV) as part of an Autonomous Maritime System (AMS). The AMS was developed for the 2022 Maritime RobotX Challenge, where it will be required to complete a series of autonomous tasks such as wayfinding and object identification. The control software of the USV was used to compete in the Virtual RobotX Competition 2022, which simulated a series of tasks for the USV. AMORE worked in collaboration with the Free University of Bolzano during the design phase of the AMS.

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.

2021-22 Senior Projects Faculty Board

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

Joe Moening (Chair), David Baumann, Trevor Bryant, Jim Devaprasad, Robert Hildebrand, Zakaria Mahmud, Edo Sarda, Ron Throener, and Masoud Zarepoor

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 (Starting 2022) lssu.edu/mechatronics

Welcome to the School of Engineering & Technology

Presentation* / Demonstration Schedule

Team IPS	*1:30* / 2:00 pm*	*CAS122*
Team KOS	*2:00* / 2:30 pm*	*CAS124*
Team SMART	*2:30* / 3:00 pm*	*CAS122*
Team CAMRI	*3:00* / 3:30 pm*	*CAS124*
Team STAC	*3:30* / 4:00 pm*	*CAS122*
Team AMORE	*4:00* / 5:00 pm*	*Rotary Park*

****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
lssu.edu/eng *or* 906-635-2207

LAKE SUPERIOR STATE UNIVERSITY

The School of Engineering & Technology

presents the

Class of 2022

Senior Design Project Presentations & Demonstrations

Friday • May 6th

1:30 p.m. – 5:30 p.m.

in the

Center for Applied Science and Engineering Technology

Presentations: lssu.zoom.us/j/97068476445
Demonstrations: lssu.zoom.us/j/95821944872