SCHOOL OF ENGINEERING
& APPLIED SCIENCE
**Department of Engineering
Technology**

CONCURRENT
PRESENTATIONS

**Friday, April 27
9:30am-5pm**

FREE & OPEN TO THE PUBLIC.

MIAMI UNIVERSITY REGIONALS
HAMILTON • MIDDLETOWN • VOA • GHSA

North Central
State College

SENIOR DESIGN 2012 *projects*

FOR CONCURRENT NORTH CENTRAL STATE COLLEGE PRESENTATIONS, SEE OTHER SIDE.

Miami University Regionals
Hamilton Campus
Harry T. Wilks Conference Center

9:30am
Wireless Heart Rate Monitor

**Yacouba Yeye, Mark Ramos,
Russell Bottoni**

The objective of the project is to create an alert system that allows monitoring a person with cardiac problems in a health-care facility using wireless networks. The project team designed a wearable pulse detector that wirelessly transmits heart rate data to a server computer using a network of wireless nodes operating at IEEE 802.15.4 ZigBee wireless protocol.

10am
Integration of a Fanuc M710i Robot into a DMAX Ltd. Diesel Engine Manufacturing Process Cell

**Todd C. Wright, Miguel Rojo,
Timothy Bulcher**

The objective of this project is to simulate the install of a Fanuc M710i robot into the assembly process at the Duramax diesel engine manufacturing facility, DMAX Ltd in Moraine, Ohio. This computer simulation includes the design of fixturing and a manufacturing cell prior to the beginning of construction of this cell. The robot will be used to tighten five bolts securing the engine's fan center bracket and three bolts that will secure three idler pulleys.

10:30am
Miami Bottling Company

Yaw Atta, Scott Tobias, Nick Brown

Student engineers designed an automated bottle capping system that integrates into a bottle filling system that this team worked on as an informal project last year. This project will be used to conduct a variety of lab classes for future engineering technology students.

11am
Automated Bottle Palletizing

**Mat Collins, Scott Sorrell,
Mike DiGiovanna**

Student engineers utilized a fully automated robotic cell in order to develop a custom bottle palletizing application. The purpose of this project is to assist in the completion of the bottling lab project, specifically, the removal and storage of multiple sized bottles after capping and labeling have taken place.

11:30am
Hydrogen Generator to Provide Supplemental Power to an Internal Combustion

**Dustin Brown, Matthew Baker,
Matthew McFadden**

Student engineers designed and constructed a hydrogen generator that can supplement gasoline as a fuel to increase the fuel mileage in an automobile. The developed prototype generator demonstrates the ability to generate such a quantity of hydrogen on a portable platform to theoretically power an automobile with 4, 6, or 8 cylinders.

12-1PM • LUNCH & ENT AWARDS PRESENTATION

1pm
Electric SUV Operating Efficiency Optimization

Dante Simmons, Zach Zachman

The primary objective of this project is to optimize the efficiency of a custom-built electrically powered SUV based on driving distance per charge. For this project, our involvement will be to research, calculate, and test different ideas for improvement to determine what gains may be experienced. Then a cost/benefit analysis will be conducted based on the results and the best two or three changes will be implemented and their results measured.

1:30pm
Unmanned Aerial Vehicle Project

Thomas White, Matt Poeppelman

Students designed and built a remote-controlled airplane capable of dropping an object and hitting a target on the ground with precision. The plane is also equipped with an onboard microprocessor, environmental sensors and a Global Positioning System (GPS). Sensor and GPS data are transmitted to a ground receiver wirelessly in real time, where they can be analyzed for remote-monitoring applications.

2pm
Improving Heat Transfer of a House via Solar Power and Rainwater Harvesting

**Derick Robinson, Ernie Martindille,
Jeff Weller**

The project will upgrade an air conditioning unit and use solar power and rainwater harvesting to improve the heat transfer system of a house. Thus the electricity needs can be lowered and the efficiency of the overall energy efficiency can be increased.

2:30pm
Development of Client-Server Robotic System

Bernard Adai, Chuck Higgins, Bob Davis

Students developed a client/server software system incorporating a robot-arm manipulator in the Miami University Hamilton. This system is aimed to allow both local and distance engineering technology students to access the robot manipulator by sending control commands and receiving audio/visual feedback remotely using the world-wide-web.

3pm
Lab Projects Designed as Instructional Aids for Engineering Technology Courses

Tyler Griffin, Matt Hayes, Anthony Oliver

The objective of this project is to create eleven (11) new informative and fully developed laboratory exercises for engineering students. These labs were created using the Pasco structural system for mechanical design classes, GD&T measurement systems for CAD and manufacturing classes, dynamic measurements for dynamics and instrumentation classes and operating efficiencies for CAM classes.

3:30pm
Offsite 3-Phase Motor Control

Ryan Caseman, Tim Grimm

The project will control and monitor the operation of a 3-phase motor with server-client model. The server connects with the motor using Labview through a driver. As the request of the client connected through internet, the server can control the motor and send back the operating conditions of the motor.

SENIOR DESIGN 2012 *projects*
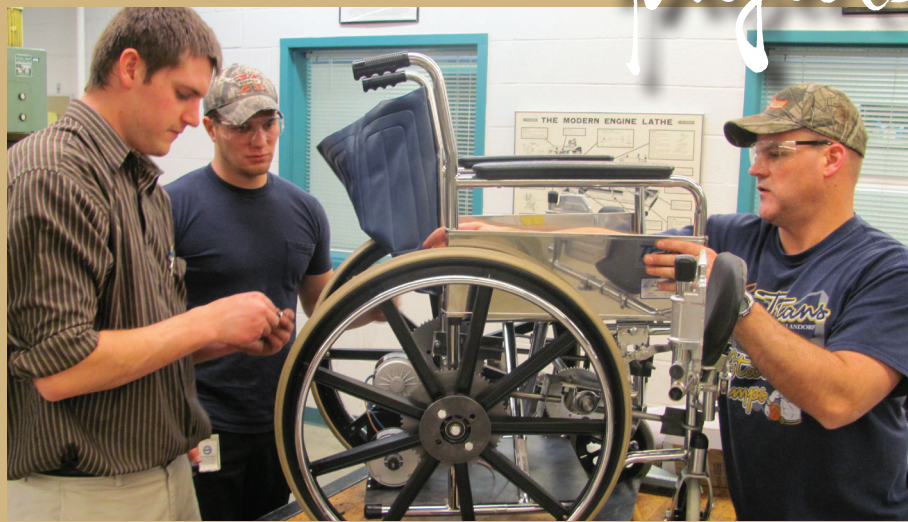
North Central State College

Kehoe Center, Shelby, OH

9:30am
Reverse Vending Machine

Matthew Pierce, Jonathan Dewitt, Freddie McLaughlin

The student engineers designed and developed a prototype vending machine that accepts aluminum beverage cans, crushes them and then gives the user acknowledgment of the number of cans crushed. The prototype system is intended to be used in grocery stores and public locations.

10am
Real-Time Telemetry on a Racing Cart

Dan Strong, Ethan Woodland

Student engineers designed and developed a real-time wireless monitoring system for an electric go-cart. With the system developed in this project, the performance characteristics of the go-cart vehicle, built by Northwest State Community College's EV motorsports team last year, will be monitored from the pit area on a lap top computer.

10:30am
Development of Physics Lab Experiments for Rhodes State Community College

Earl Brim, Tyler Hirschfeld, Jim Reser, Mike Kreitzer

The project team developed a set of new laboratory experiments for improving and modernizing the existing Physics laboratory experiments of the Rhodes State College. The new labs fit better the new semester schedules of the college.

11am
Comparative Analysis and Practical Application of a Vertical Axis Wind Turbine in Low Wind Regions

Kirk Henderson, Ted Fehrman, Dakota Tom

Student engineers built and evaluated a test rig for a vertical axis wind turbine. Using similar design criteria, two separate blade designs were constructed and tested in comparative situations. The two design styles are Savonius style, which is widely used in industry, and the other is Louver style, of their own design. Using the Savonius style as a base line, the students were to determine if their design could have practical uses in wind power generation.

11:30am
Automated Bottle Labeling

Chizuko McCullough, John Hostal, Mohamed Maiga

The project was to design a labeling system for the ENT402 Automated Bottling Conveyor System Lab for Miami University. The team determined the center of gravity for the labeling position and designed the labeling apparatus, as well as programming the actuators and sensors through a PLC.

12-1PM • LUNCH & ENT AWARDS PRESENTATION

1pm
Indexing Table Phase 2

Adam Hiller, Matt Montgomery, Jon Vickers

This project is an improvement to a PLC controlled indexing table built in the previous academic year. The project team enhanced the design and stability of the table, and replaced the current control system with CUBLOC for greater flexibility. The end product of this project is intended to be used in the robotics and manufacturing courses in the 102 Phelps Hall in Miami University, Hamilton campus.

1:30pm
Multi-Purpose Hybrid Power Regenerating Drive

Josh Schnipke, Joe Kuhlman, Joe Wilker, Colin Clute

The main objective of this project is to design and build an inexpensive, multi-purpose Hybrid Regenerative Power Source for power portable vehicles – stroller's, dollies, carts, wheelchairs etc. The student engineers designed and developed a system that attaches on a power wheel chair and regenerates power when the wheel chair is coasting, braking, or being pushed.

2pm
Roving Runnability Tester for Glass Fiber Packages

John Graham, Justin Reilly

The objective of this project is to create a stand-alone test bench that can measure the force it takes to pull the glass strand out of a package. The students developed and tested a LabVIEW program, which would interface with a load cell and two tension meters. The speed of a motor is controlled in LabVIEW in order to simulate the real life condition to pull out the glass strand. The test data will be recorded and analyzed to reduce wound loops/catenaries during manufacturing process.

2:30pm
Autonomous Parallel Parking of an Rc Car

Karyn Dodge, Caitlyn Kimball

The concept behind this project is to make the cumbersome process of parallel parking autonomous. Students will achieve this by using an RC car as a proxy and automating it using a skill based approach involving fuzzy logic. The RC car is equipped with three IR proximity sensors, a microcontroller (Arduino Duemilanove 2009), and an H-Bridge (Texas Instrument SN754410). The IR proximity sensors will detect when the car comes in close contact with an object and identify spaces that are large enough to park in. Once a parking space is detected, the H-Bridge will regulate the speed and direction of the two motors and self-park the car.

3pm
Wireless Web Based Automated Window Blind System

Matt Bello, Emmanuel Osademe

The project is to design and build an automated window blind system, which will include a relay controlled 120V outlet, both of which can be controlled and monitored remotely using an internet browser via a home-based web server. The window blinds and the outlet can also be automatically operated based on ambient light and the time of day. The project aims to be part of the green and intelligent home.