ENERGY HARVESTING AND WIRELESS SENSOR NETWORKS

|  |  |
| --- | --- |
| Faculty SupervisorProject DescriptionLearning OutcomesProject DeliverablesAnticipated Resources | Orlando Baiocchi  Energy Harvesting from trees and its eventual use to power wireless sensor networks (WSN). Utilizing several trees of different sizes and species and located with different solar orientations in order to establish the relation between variables and the amount of energy that can be extracted from them. That requires the use of nails of different sizes that will be attached to thermo-electric generators (TEGs) and to electronic circuits that will process and store that energy. In a subsequent stage, we would like to use that energy to power up a sensor network system consisting of two or more nodes at the frequencies of 900 MHz and 2.4 GHz. In other words, we hope to have “trees talking to other trees”, using their own energy. The sensors will measure factors like particulate density, carbon monoxide and dioxide, humidity, temperature, etc.  Involvement in this project will teach students a variety of soft and hard skills. Literature review, teamwork, networking, research, consultation, application of EE and CE courses, soldering, microcontrollers, sensors, power tools, ecology.  Students will work on engineering the product required but this project may take longer than one quarter. If weekly progress is made, the project will continue.  The faculty supervisor will provide or purchase all required hardware. |

# Project Timeline

|  |  |  |
| --- | --- | --- |
| Week | Item | Due Date |
| Week 1 & 2 | Research and Design | July 12, 2019 |
| Week 3 & 4 | Build and Test | July 26, 2019 |
| Week 5 & 6 | Deploy and Monitor | August 9, 2019 |
| Week 7 & 8 | Analyze and Brief | August 23, 2019 |

# Final Project Format

The final project will be to brief or demonstrate to the faculty supervisor the entirety of progress made.

# Grading Criteria:

# Involvement 25% Midterm Meeting 25% Documentation 25% Final Design 25%