**Project Number:** 197

Proposal site password = SeaMate

**Semester:** Spring 2013

* **Advisor:** Jane Moorhead - [janem@ece.msstate.edu](mailto:janem@ece.msstate.edu)
* **Team Leader:**  Mark McConnell – [mtm250@msstate.edu](mailto:mtm250@msstate.edu)
* **Team Members:**
  + Robbie Lundine – [rbl70@msstate.edu](mailto:rbl70@msstate.edu)
  + Chance Sistrunk – [ces338@msstate.edu](mailto:ces338@msstate.edu)
  + Justin Gilmer –[jtg172@msstate.edu](mailto:jtg172@msstate.edu)

**Project Keywords:**

ROV(Remotely Operated Vehicle), SEAMATE Competition, Sonar, Underwater

The purpose of the following worksheet is to document the EE/CPE Design project, design team, and faculty mentor, prior to beginning the course. 

**1. High-level project description (problem solved by design and functionality).**

Develop a platform to compete in the 2013 Rov competition that incorporates features such as video, sonar, magnetic heading, lighting and other components as required to complete the mission specifications for the competition. The competition missions will be released December 21 2012.

**2. A brief discussion of relevant technical background material on which the project is based (identify at least 3 published references).**

[1] R.Reese, B.Jones, and J.W.Bruce. Microcontrollers: From Assembly Language to C Using the PIC24 Family. Boston, MA: Course Technology, 2009. Print (Used for implementation of the microcontroller in the circuit.)  
  
[2] Sedra, Adel S., and Kenneth Carless. Smith.Microelectronic Circuits. New York: Oxford UP, 2010. Print. (Used for implementation of voltage sampling methods/circuits.)

[3] “Underwater Robotics Competitions” – <http://www.marinetech.org/rov-competition-2/-> Accessed December 2, 2012

[4] Steven W. Moore, Harry Bohm, and Vickie Jensen. Underwater Robotics: Science Design & Fabrication. Monterey, Ca: Marine Advanced Technology Edu, 2010. Print (used for the physical design of the Rov)

**3. Projects are evaluated, in part, on the inclusion of a number of the following "real-world" concerns. Provide preliminary comments on how these issues relate to your design.**

Economic:

The ROV is constructed of relatively low cost materials that are generally off the shelf. If a higher quality ROV is desired then higher grade materials can replace the off the shelf materials.

Environmental:

Is powered by electricity and will have the capability to resurface in the event of a power failure.

Sustainability:

This platform can be modified to use any new technologies to meet any future needs.

Manufacturability:

Using low cost components it could be replicated easily and cheaply.

Ethical:

None

Health and Safety:

The ROV prevents the need for human presence in adverse and dangerous underwater environments. Due to the waterproofing of the system there is a minimal shock hazard.

Social:

None

Political:

None

**4. More detailed description of hardware and software design components (both hardware and software design are required for CPE students and both are strongly encouraged for EE students).**

Pre-existing Hardware (provided by Jane Moorhead):  
-Waterproof Camera

-Motors  
-Sonar  
-Arduino and related components

Hardware:  
-Microcontroller  
-Servos   
-Electrical components (resistors, capacitors, etc.)  
-ROV frame  
  
Software:  
-Video Capture Software  
-Arduino Controller Software

Additional hardware and specifications to be determined after the mission specification release date of December 12 2012.

**5. Vision for participation in project by team members.**

Team members will be expected to participate equally in all aspects of the project. As the project progresses, specific tasks may be delegated for particular team members as needed.

**6. Preliminary schedule of what you are planning to do and discussion of feasibility.**

-January

-Acquire and Test Parts

-Build Platform

-February

-Mount and Test Motors and Camera Underwater

-Controller Interface

-March

-Finish Camera Interface

-Mount and Test Sonar Underwater

-April

-Mount and Test Robotic Arm Underwater

-Final Testing

-June

-Competition