

Direct Contact (Lecture) Hours:

Note: There must be at least 12.5 Direct Contact (Lecture) Hours per credit. For classes of less than one semester in duration, course hours may not be compressed into fewer than three days per credit (No more than one credit may be earned per week, per student).

Date	Times	Hours (A) *
6/14/2010	8AM-1PM; 2PM-6PM; 8PM-10PM	11
6/15/2010	8AM-1PM; 2PM-6PM; 8PM-10PM	11
6/16/2020	8AM-1PM; 2PM-4PM	7
		Total Hours: 29

*Note: Hours (A) total must match Content Topics Table, (A) Direct Contact (Lecture) Hours column total.

*Note: These Hours (A) should also match the Agenda submitted with this proposal.

Final Assignment Due Date: October 15, 2010

Course Description:

Super SeaPerch: Underwater Robotics is a joint effort of the Society of Naval Architects and Marine Engineers, the National Defense Education Program, and the SpringBoard STEM Program of the Juneau Economic Development Council. The course’s goal is to support and model the effective teaching of science at the middle and high school level based on the use of hands-on, minds-on experiences for students and their teachers.

The Super SeaPerch course is a three-day residential workshop for a select group of teachers who may each invite one student to attend. The workshop provides accommodations at the Shrine of St. Therese and lab explorations at the Ted Stevens Marine Research Institute located at Auke Bay NOAA headquarters.

This workshop assumes basic experience with construction and use of the SeaPerch. We will be focusing on use of sensors for investigating the underwater world and for developing semi-autonomous control of the SeaPerch. For example, one goal is for students build their own pressure sensor and feedback control loop allowing them to dial in a depth setting on their hand held controller and have their SeaPerch automatically dive to and maintain that depth on its own. We will be using underwater video cameras, wearable screen monitors, temperature sensors, hydrophones, still image cameras doing time lapse photography, computers, microcontrollers and lots of interactive engineering design, to develop and drive some very sophisticated ROV’s. But the real goal is to show how much fun and engaging learning can be when students help drive the design process. Some additional topics that blend engineering, art, and science into engaging hands on projects will also be covered.

(A) Direct Contact (Lecture) Hours Description:

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Course Topics	(A) Direct Contact (Lecture) Hours
Development of the Sea Perch, overview of the workshop, Parts list, safety overview	1
Limitations of the current control system, modes of propulsion, lack of instrumentation	1
Advanced control using programmable drivers such as NXT, VEX and Parallax BASIC Stamp boards, languages such as P-Basic, ROBOT C	5
Integrating programmable controllers with on-board thrusters	2
Lighting the darkness and seeing your way with LEDs and CCD Cameras	4
Fabrication and integration of a programmable depth controller	3
Fabrication and integration of a sound impinger for navigational control	4
Fabrication of a remotely actuated water sampler	3
Finding your way underwater, compasses, accelerometers and gyroscopes	5
How do you determine the "Best" technology	1
	Total: 29

Participant Total Hours/Credit:

(Minimum 12.5 Direct Contact Hours per Credit)



One (1) Credit = Twelve & one-half (12.5) hours to twenty-four & one-half (24.5) hours

Two (2) Credits = Twenty-five (25) hours to thirty-seven (37) hours

Three (3) Credits = Thirty-seven & one-half (37.5) hours to forty-nine & one-half (49.5) hours

Class size: Minimum _____ Maximum 14 No limit _____

Grading:

X Pass/No Pass

Letter Grade

Instructional Goals and Defined Outcomes:

(Knowledge and skills the student will have gained upon completion of the course.)

Teachers will be asked to identify science, math and engineering content areas that students will find relevant to their needs and expectations. Teachers will develop (with their students as partners) curricula and design programs that will meet the interests, knowledge, understanding, abilities and experiences of their students as they relate to the Alaska GLEs, as met by a unit related to underwater explorations by unmanned robotics.

Assessment of Student Performance (beyond attendance):

1. How will students **demonstrate** that objectives were met?

Teachers, in consultation with their students, will develop a classroom unit related to unmanned underwater exploration that will make available to students science tools, materials, media, information and technological resources. These resources will encourage and allow students to engage, explore and evaluate in an environment that is inquiry-driven.

2. Describe the **products and performances** resulting from the teaching and learning activities.

Classroom students will demonstrate their new understandings by solving problems and designing solutions that are outside the “Standard, acceptable norms” for engineering and exploration. They will demonstrate through classroom artifacts, notebooks, and group work that they are “thinking outside the box”.

3. Describe how students will be expected to **integrate** the knowledge and skills they have gained in this course into their professional practice.

As teachers become more comfortable in reaching out to a community that includes their students and other teachers as resources when developing curricula, their teaching will become more informed and relevant to their student audience.

4. For ED courses (per UAS Academic Catalog) “**students are expected to put in two hours of outside effort for every one hour in class in accordance with the standard Carnegie unit of credit.**” Describe the “outside effort” (i.e. homework, practice, implement, etc.) and hours (1 credit=25 hours, 2 credits=50 hours, and 3 credits=75 hours).

Reminder: Copies of course evaluations are to be provided to the University at the end of this course.

Please send completed course proposal form and required documents to:

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Determination: **Approved** **Denied**

Signature of Director or designee: _____