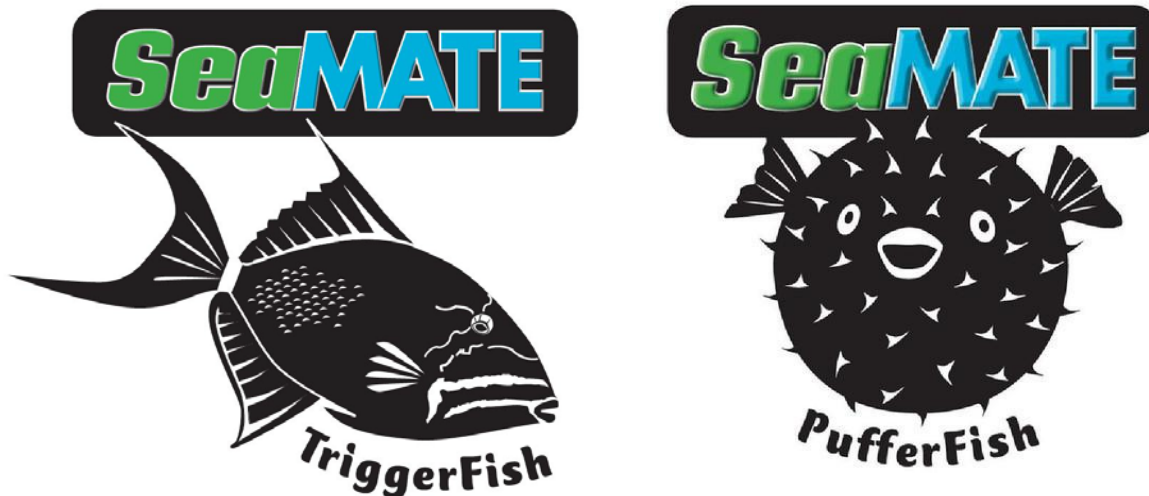

MATE Center Summer Institute

SeaMATE ROV Building

July 9th – July 15th, 2017

Draft Agenda



Day 0	Sunday, July 9, 2017	
TIME	ACTIVITY	LOCATION
	Everyone checks into the hotel	Casa Munras

All labs will be at Monterey Peninsula College, Life Science (LS) Building Room 101, unless otherwise noted.

Pre-workshop Homework:

- Read UW Robotics Textbook: Chapter 1, 2, Working in Water p.120-141, Chapter 6, Electric motors p.319-323, Electricity p.377-388, Transmitting power p.425-428 (7.4), Printed Circuit Boards p.440-1, **Motor Control p.466-527**, Payloads and hydraulics p. 534-546.
- *Recommended: MAKE Electronics read experiments 1-6; soldering p.106, 107, 109, motors and magnetism p. 236-241. See online course for the book.*
- PhET

DAY 1	Monday, July 10, 2017	MPC LS 101
TIME	ACTIVITY	Presenter
8:30 - 9:45 am	Goals for the course, logistics, and your presentation. <i>Participant Expectations: what do you want out of this?</i>	Deidre
9:45 – 11:40 am	<ul style="list-style-type: none"> What is an Engineer & Exploring different designs with ROV in a Bag 	Matt
11:40 - noon	<ul style="list-style-type: none"> Engineering Design Process 	Jim
12:00 - 1:00 pm	LUNCH	
1:00 - 3:30 pm	Electronics: <ul style="list-style-type: none"> Multi-meters - Scott Simple Electronic Circuits – Deidre Batteries, fuses, and power – Jim 	
3:45 – 4:15 pm	<ul style="list-style-type: none"> ROV 101 and Mission Brief 	Matt
4:15 – 4:45 pm	<ul style="list-style-type: none"> Project Management 	Jim
4:45 – 7:30 pm	<ul style="list-style-type: none"> Review frame section and design your frame 	Matt
6:00	Pizza Dinner	

Homework:

Entrepreneurial Exercise: Come up with a company name, ROV name, and tagline
Develop a project management schedule.

Triggerfish Participants only:

Find a Good Motor Controller

Review H-Bridges <https://www.youtube.com/watch?v=iYafyPZ15g8> (first 1:30)

DAY 2	Tuesday, July 11, 2017	MPC LS 101
TIME	ACTIVITY	PRESENTER
8:30 – 9:00 am	Share company name, ROV name, tagline and project management schedule. TriggerFish participants share motor controllers.	Matt
9:00 – 9:30 am	Design for performance, sources of design ideas, and Innovation vs. Engineering	Jim
9:30 – noon	Soldering Skills <ul style="list-style-type: none"> • Basic soldering of wires and waterproofing <ul style="list-style-type: none"> ○ Power System • Soldering Components to a PCB • MATE Practice Board 	Matt
12:00 - 1:00 pm	LUNCH	
1:00 – 1:30 pm	Understanding Your Controller How a switch works (video 2A, 2B, 2C) TriggerFish Controller Simplified	Matt
1:30-5:00 pm	Building Your Control Box	Everyone

Homework:

Moving and maneuvering p. 304-309, p.319-353, review payloads and hydraulics p. 534-546.

PhET:

- <https://phet.colorado.edu/en/simulation/circuit-construction-kit-dc>
- <https://phet.colorado.edu/en/simulation/ohms-law>
- <https://phet.colorado.edu/en/simulation/resistance-in-a-wire>

Review MATE Competition Tech reports. <http://www.marinetech.org/tech-reports/>

Day 3	Wednesday, July 12, 2017	MPC LS 101
TIME	ACTIVITY	Presenter
8:30 – 8:45 am	Questions and comments	Matt
8:45 – 9:00 am	Introduction to the SID	Scott
9:00 – 10:00 am	Waterproofing a camera (part 1 and 2)	Jim
10:00 – 10:15 am	Break	
10:15 – 10:45 am	Hydraulics	Matt
10:45 -11:15 am	Making a motor	Jim
11:15 – noon	Adding a fourth motor Bollard Testing	Matt
12:00 - 1:00 pm	LUNCH	
1:00 – 1:30 pm	Shroud design	Jim
1:30 – 5:00 pm	Continue working on ROVs <ul style="list-style-type: none"> Pour epoxy in camera (must harden overnight) 	Everyone

Homework: Chapter 6, PhET buoyancy exercise

Optional: Tour MBARI website www.mbari.org

Day 4	Thursday, July 13, 2017	MPC LS 101
TIME	ACTIVITY	Presenter
8:30 - 8:45 am	Questions and comments.	Matt
8:45 – 9:30 am	The Marine Workforce	Deidre
9:30 – 10:30 am	The MATE Competition	Jill
10:45 - noon	Buoyancy calculations on the ROV <ul style="list-style-type: none"> • Calculate buoyancy of vehicle in water • Attach buoyancy 	Deidre Scott
12:00 - 1:00 pm	LUNCH	
1:00 – 2:00 pm	Troubleshooting <ul style="list-style-type: none"> • What to do when something goes wrong? • Troubleshooting exercises 	Matt
2:00 – 5:00 pm	Work on your ROVs Practice driving ROVs Safety Checks	Everyone
3:00 pm	Optional Presentation: Why move up to a microcontroller?	Scott

Homework:

Prepare your talk

Day 5	Friday, July 14, 2017	MPC LS 101
TIME	ACTIVITY	Presenter
8:30 – 9:00 am	Safety checks continued (Safety checks can start as early as 8:00am) Pack for pool.	Everyone
9:00 – 11:45 am	Set up at pool Product Demonstration at MPC pool	Everyone
11:45 – noon	Return from Pool	Everyone
Noon - 1 pm	Lunch	
1:00 – 1:30 pm	Integrating ROV activities into the classroom or club: How to get started and organized	Jim
1:30 – 2:15 pm	Classroom Management	Stan
5:30 pm	Participant Presentations Dinner at Casa Munras	Casa Munras

Departure Day, Optional trip to the Monterey Bay Aquarium

Day 6	Saturday, July 15, 2017	
TIME	ACTIVITY	LOCATION
9:00 am - ?	Monterey Bay Aquarium, Meet at Casa Munras	Monterey Bay Aquarium