

Living Schedule - Biology 461 – Spring 2006

Underwater Research Methods and Techniques

Instructor: Mark Flahan, Diving Safety Officer
Office: Physics 240
Office Hours: Tuesdays 11 am or by appointment
Phone: 619-594-6799 direct and messages, (619-977-6275 Cellular)
Recorded dive site, activity, information: 594-5867
Weather, surf and dive conditions: 619-221-8824
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Course Objective:

While meeting all CSU and American Academy of Underwater Sciences (AAUS) requirements, train and certify a knowledgeable, effective, competent and safe Scientific Diver.

Prerequisites:

- NAUI Master Scuba Diver or equivalent knowledge and skills.
- Minimum of 12 dives within the previous year not including formal class training and evaluation dives. Dives shall be in cold (San Diego) water conditions, varied in environment, depth and activities.
- Successfully complete pool watermanship evaluation to include 400 yard swim in less than 10 minutes, 880 yard snorkel kick in less than 20 minutes and transport another diver 100 yards on the surface in less than 4 minutes.
- Medical Exam Approval for SCUBA Diving. Be physically fit to scuba dive as indicated by completing the Medical History Form and passage of a NAUI acceptable CSU/AAUS medical exam for scuba diving within the previous 6 months.
- Students must provide their own suitable personal open water scuba equipment. Dive computer highly recommended. (Special arrangements can be made for limited use of SDSU equipment.)
- Complete application including waiver for SCUBA Diving.
- Be able and prepared to make all the scheduled class meetings, pool sessions and dives.
- Rescue Diver, CPR, First Aid and Oxygen Administration Certification recommended. Must be current to receive Assistant Instructor Certification. May be offered as part of this course – time permitting.

Special Considerations:

- Physical exams for scuba must be completed within the first 4 weeks.
- Students should be prepared to spend the entire time at the dive site.
- Students should not dive 24 hours prior to ocean dives.
- Students should not fly or go to altitude (over 1000ft) within 24 hours after diving.
- There may be some boat diving and field trips involved. Students will be required to pay the appropriate costs for any rentals, field trips, etc.
- Students may be contacted through e-mail regarding announcements, assignments, activities, schedule changes, etc. You must check your email regularly.
- Messages for Mark must be left at 619-594-6799. Do not call my cell after 10pm.
- Each student must maintain a personal dive log to be submitted at the end of the course.
- CPR, First Aid, Oxygen Administration certification must be current at end of semester. These courses may be made available as part of course – time permitting.
- Possibility of Enriched Air training as part of this course.
- This course requires additional meetings TBA.

Equipment Requirements:

Mask, snorkel, fins, boots, gloves, wetsuit/dry suit, weight system, scuba cylinder, regulator, submersible pressure gauge, BC with power inflator or combination power inflator /alternate air source, AAS, timing device, depth gauge, dive computer highly recommended, compass, plastic dive tables, log book, dive knife or tool.

Meetings:

This class meets on Tuesdays on campus at 1900 and on Fridays at various San Diego dive locations at (1200) 1300. Class will make 2 dives whenever possible. We will make 2 night or limited visibility dives, most likely on Friday nights at 1930. There will be at least one weekend meeting and field trip most likely to the Wrigley Catalina Marine Science Center (WIES). There may be one/two 1/2 day boat trips.

Schedule: This is a proposed “living” schedule.

- **Actual activity, dive site, dive objective or meeting time may vary with the environmental conditions.** La Jolla shores or Mission Bay may be used as an alternate dive sites.
- This class meets regardless of the weather conditions. Dives are not canceled.
- Call the 594-5867 the Thursday before each scheduled meeting to confirm location and activity.
- Call San Diego dive information at 619-221-8824 prior to the dive for local beach and weather conditions.
- Night Dives will be scheduled for Fridays as schedule and water conditions permit.
- Midterm Exam on March 8. Final according to finals schedule or week prior with exam review meeting during finals week.

Lectures: Tuesdays 7-9 pm. Ocean sessions: Fridays (12) 1-4 pm. Plus additional times TBA. Avoid Friday 11am classes.

<u>Week</u>	<u>Date</u>	<u>Day</u>	<u>Activity</u>
1	1-20	Fri	Classroom – Orientation
2	1-24	Tue	Classroom. Marine Life
1	1-27	Fri	Ocean Snorkel Dive La Jolla Shores or LJ Cove
3	1-31	Tue	Classroom
	2-3	Fri	Ocean Scuba (Briefings, navigation, 880 Kick, Scuba Skills Eval)
4	2-7	Tue	Classroom
	2-8	Wed	First Aid
	2-10	Fri	Ocean Scuba 2
5	2-14	Tue	Classroom
	2-15	Wed	First Aid
	2-17	Fri	Ocean Scuba 2
6	2-21	Tue	Classroom
	2-22	Wed	Oxygen Administration
	2-24	Fri	Ocean Scuba 3 (Open water Training & Rescues)
7	2-28	Tue	Classroom
	3-3	Fri	Scuba 4 plus night dive?
8	3-6	Tue	Classroom - Midterm I
	3-10	Fri	TBA
9	3-14	Tue	Spring Break
	3-17	Fri	Spring Break
10	3-21	Tue	Classroom
	3-24	Fri	Ocean Scuba Night Dive
11	3-28	Tue	Spring Break
	3-31	Fri	Spring Break

12	4-5 4-8	Tue Fri	Classroom Ocean Scuba
13	4-4 4-7	Tue Fri	Classroom Ocean Scuba, Rescues
14	4-11 4-14	Tue Fri	Classroom Ocean Scuba - CATALINA????
15	4-18 4-21	Tue Fri	Classroom Ocean Scuba
16	4-25 4-28	Tue Fri	Classroom, Exam Reviews, Fees, Administrative Paperwork Ocean Scuba
17	5-1 5-4	Tue Fri	Classroom Open water Final Testing and evaluation
18	5-8	Tue	Classroom

Lecture Topic Areas:

scientific techniques	data collection techniques	field identification of local marine life
EAD (Nitrox) diving	AAUS and SDSU regulations	hyperbaric conditions/chamber orient.
lead diver responsibilities	briefings/debriefings	search and recovery
underwater mapping	small boat diving	underwater photography
dive planning	hunting and collecting	rescue and emergency procedures
underwater navigation	diving fitness	diving medicine and physiology
nightdiving	decompression theory and therapy	dive tables and dive computers
diving first aid	deeper diving	diving equipment
O2 administration	cold and diver performance	diving environment
CPR		

Lecture/discussion will also be included as part of the open water meetings. You will be responsible for information presented at the dive site. Lecture materials will be supplemented with handouts and outside assignments and readings.

Possible Practical Activities/Dives:

underwater photography	data collection techniques	field identification of local marine life
search and salvage	airlift sampling	transects and kelp bed observations
deeper diving	night diving	rescues and emergency procedures
collecting techniques	wreck diving	behavioral observations
underwater navigation	canyon mapping	beach entries and exits
small boat diving	surveying techniques	limited visibility diving
skills enhancement	rocks, rips and reefs	physical conditioning
enriched air diving	briefings/debriefings	

Practical Objectives: Be able to:

1. Follow dive plans and complete assigned dive objectives.
2. Demonstrate acceptable underwater data collection techniques and procedures for the sampling techniques taught and utilized in class
3. Identify 100 commonly encountered local marine animals and plants.
4. Properly assemble, use and maintain specialized scientific equipment.

5. Demonstrate safe and effective scientific dive planning including briefings/debriefings and dive activity organization.
6. Safely complete a variety of dives including deep, night, 3R's, search and recovery and limited visibility under a range of water conditions.
7. Complete an open water rescue of a SCUBA diver including EMS activation, scene management and preparation for transportation.
8. Demonstrate proper diving skill at all times including, effective budding techniques, weighting, buoyancy control and the ability to navigate while underwater.
9. Demonstrate safety and emergency skills including all out-of-air skills.
10. Kick in full snorkeling equipment a distance of one mile.
11. Demonstrate one person CPR, First Aid and oxygen administration skills.
12. Safely and effectively enter and exit the water from a variety of beach types and conditions.

Grading:

1. Periodic Subject Examinations	160 points
2. Final Examination	200
2. Assignments, results or short reports	100
3. Practical tests	100
4. Completion of the dives objectives 12@20 pts	<u>240</u>
A = 720 pts B = 640 pts C = 560 pts D = 480 pts	Total 800 points

Certification as a SDSU Scientific Diver:

1. Minimum 80% on written examination(s).
2. Completion of 12 class dives. Must complete night, deep, rescue, 3R's, conditioning and limited visibility dives.
3. Demonstration of acceptable diving skills and fitness to dive
4. Ability to complete dive objectives in a safe and efficient manner
5. Demonstration of acceptable e data collection techniques
6. Current Physical Exam Approval
7. Current certification in CPR, FA and O2
8. Completion of all administrative details
9. Log of monthly dives
10. Successfully complete AAUS/CSUC swim test, diver training, dive activity and certification requirements as specified in AAUS/CSUC Diving Manuals.
11. Ability to assess a dive site for its suitability for the conduct of diving operations and the ability to provide a dive site/activity/objectives briefing (SEABAG) to the members of a dive team
12. Demonstration of mature judgment necessary to plan and conduct dives in a safe and effective manner in accordance with the "CSUC Minimal Standards for SCUBA Diving Certification and Operation of SCUBA Diving Programs" and a willingness to follow SDSU Scientific Diver Regulations.
13. **Instructor's subjective evaluation.**
(NAUI Advanced Diver, Master Diver, Rescue Diver, Nitrox Diver may also be available, along with CPR, First Aid and O2 Administration depending)

Textbooks:

1. Required:
 - NAUI. NAUI Master Scuba Diver, 2000.
 - NAUI. NAUI Master Scuba Diver Workbook, 2003.
 - NAUI Plastic Dive Tables
 - Gotschall. Pacific Coast Subtidal Marine Invertebrates, 1994.
 - Gotshall. A Fishwatchers Guide to the Inshore Fishes of the Pacific. 1995.
 - Sept. Beachcombers Guide to Seashore Life of California, 2002.
 - CPR, First Aid, CPR Materials
 - Flahan. Handouts/emails/Syllabus for Assistant Instructor SCUBA
2. Recommended:

- Heine. Scientific Diving Techniques. A Practical Guide for the Research Diver. Best Publishing 1999.
- NOAA. Diving Manual. 4th Edition. 2001. Best Publishing
- Wrobel and Mills. Pacific Coasts Pelagic Invertebrates. 1998.
- Jensen. Pacific Coast Crabs and Shrimps. 1995.
- McConnaughey. Pacific Coast Audobon Society Nature Guide Series. 1986.
- Behrens, D. W. Pacific Coast Nudibranchs. 1980.
- Audobon Society. The Audobon Society Field Guide to North American Seashore Creatures. 1981.
- NAUI. Scuba Rescue: Skills and Techniques, 2000.
- NAUI, NAUI Nitrox Text, 2000.
- NAUI, NAUI Nitrox Workbook, 2000

Fees:

1. Laboratory fee to support pool rental and NAUI textbooks and materials.
2. NAUI Rescues and AI registration fees which includes first year dues - \$120.00
3. Physical Exam for SCUBA Diving. Available from the SDSU Health Services.
4. Books.
5. Field Trips, Boat Dives at personal expense. (Catalina \$170)
6. Expendable supplies and sampling equipment

Special Equipment: Underwater slate and pencils; float, line and anchor. Log Book to record each dive and observations for permanent record.