

UNIVERSITY OF SOUTHERN CALIFORNIA
Environmental Studies Program

ENST 298L: Introduction to Scientific Diving

Primary Instructor of Record:

David W. Ginsburg, Ph.D.	Spring 2017, 2-units
Associate Professor (Teaching), ENST	Section 33013-33016
Office: CAS 116C, dginsbur@usc.edu	Fridays 2:00-4:50 pm
Office hours: TBA	WPH 106

Co-Instructional Staff:

Eric Castillo	Tom Carr
USC Dive Safety Officer	Public Safety Dive Instructor
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Overview: This course provides academic preparation in the physics, physiology, safety, and methodology for in-water scientific diving. Scientific divers should understand a broad range of specialized, interdisciplinary topics before they can safely and effectively design or perform scientific measurements in the water. Where appropriate, topics covered include gas properties (chemistry, physics, gas laws, etc.), decompression theory, compressed gas physiology (narcosis, oxygen toxicity, decompression sickness, etc.), and dive planning including no-decompression scheduling and gas consumption calculations. Students will be introduced to the design of measurement protocols for monitoring underwater environments including transect and quadrat methods for evaluating substrate, fish populations, invertebrate organisms, and algal cover. Dive safety training will include oxygen administration for diving injuries and basic life support. All content is consistent with the guidelines outlined by the American Academy of Underwater Sciences (AAUS) and the USC Dive Manual approved by the USC Dive Control Board and USC Risk Management. All USC-AAUS scientific divers in training must complete a minimum of 100 hours of cumulative training, which includes no less than 12 training dives. The academic content of this course, especially with respect to gas physics, decompression theory, physiology, and accident management, exceeds the minimum standards for scientific diver certification. Learning objectives presented here are aligned with those of the ENST Program, as a whole (for details, see: <https://dornsife.usc.edu/environmental-studies/learning-objectives/>).

Required Texts:

- USC Dive Manual, https://dornsife.usc.edu/assets/sites/218/docs/wmsc/DiveSafetyManual-USC_2014-08.pdf
- SDI academic materials (issued and discussed on first day of class)
- DAN First Aid, CPR, and O₂ academic materials (discussed on first day of class)

Format: The course will meet once a week on Friday's from 2:00-4:50 pm in WPH 101. Classroom sessions will be a mixture of lectures, demonstrations and problem solving exercises. In addition, we will meet on the following days to complete the confined and open water dive requirements of the course:

- **One confined water session at USC PED Pool on either a Saturday or Sunday TBA**
- **Students must participate and complete at least 12 training dives from the following dates:**
 - **Saturday and/or Sunday beach dives – location/time TBA**
 - **Saturday and/or Sunday boat dives – location/time TBA**
 - **Scientific dive-training weekend at WMSC on Catalina Island: April 21-23**

Grading: Each student will be evaluated based on their performance on two written examinations directly related to diving physics, physiology, safety, and experiment design (90%). Participation during class and scheduled dive training activities, the completion of AAUS, DAN, and SDI academic materials before the required deadlines, and the regular logging of training dives with the DSO is worth an additional 10% of the final course grade. Note: Additional exams will be administered by the DSO/ADSO (and/or his designee) as part of the dive certification process (e.g., SDI OW, Nitrox, AAUS Sci Diver, DAN, etc.), but these will not be included in the computation of course grades.

Below is a list of the graded assignments and their point values:

Midterm Exam	100 pts	45%
Final Exam	100 pts	45%
Course Participation	22 pts	10%
TOTAL POINTS	222 pts	100%

Classroom & Laboratory Sessions: All classroom and laboratory (i.e., confined and/or open water training) sessions are mandatory (students must participate and complete at least 12 training dives from list above). ENST will provide transportation from campus to and from Catalina Island. Only approved excuses such as medical absences, family emergencies, recognized holidays, or official USC travel will be accepted and if these become excessive they could make it difficult for you to complete the necessary training to become an AAUS Scientific Diver. In some cases, make-ups may not be possible given the availability of the faculty, staff, and campus facilities.

Academic Conduct: USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus contains the University Student Conduct Code (see University Governance, Section 11.00), while the recommended sanctions are located in Appendix A.

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards (<https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct (<http://policy.usc.edu/scientific-misconduct/>).

Discrimination, sexual assault, and harassment are not tolerated by USC. You are encouraged to report any incidents to either the Office of Equity and Diversity <http://equity.usc.edu> or the Department of Public Safety <http://adminopsnet.usc.edu/departments/departments-public-safety>. This is important for the safety of the whole USC community. Another member of the university community, such as a friend, classmate, advisor, or faculty member, can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men (<http://www.usc.edu/student-affairs/cwm/>) provides 24/7 confidential support, and the sexual assault resource center (<http://sarc.usc.edu>) describes reporting options and other resources.

Support Systems: A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute (<http://dornsife.usc.edu/ali>), which sponsors courses and workshops specifically for international graduate students.

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester (http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html). A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 am to 5:00 pm, Monday through Friday. DSP contact information: Ph: (213) 740-0776, TDD: (213) 740-6948, Fax: (213) 740-8216, email: ability@usc.edu.

In the case of a declared emergency and/or if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies. For details, see: <http://emergency.usc.edu/>

Statement on Religious Observation Accommodations: USC policy grants students excused absences from class for observance of religious activities. Students may be given an opportunity to make up work missed because of religious observance. I am very responsive to requests for an excused absence when made in advance. Please note that this applies only to religious activities that necessitate a student's absence from class and/or a conflict with a specific aspect of the course.

Course Schedule: For the best learning experience, you are expected to have read the assigned material by the date it is discussed in class. Readings, topics, and deadlines may be adjusted throughout the semester depending on the progress of the class.

Date	Day	Location	Topic
Jan 13	Friday	WPH 106	Introduction, Student Forms, Gear Overview
Jan 20	Friday	WPH 106	AAUS and Sci Diving
Jan 27	Friday	WPH 106	Dive Planning I, Physics I & Ecology I
Feb 3	Friday	WPH 106	Dive Planning II, Physics II & Ecology II
Feb 10	Friday	WPH 106	DAN CPR AED, FA, O2 Part I
Feb 17	Friday	WPH 106	DAN CPR AED, FA, O2 Part II
Feb 24	Friday	WPH 106	Navigation, Compass Use, Computers
Mar 3	Friday	WPH 106	Enriched Air Gases and Diving
Mar 10	Friday	WPH 106	MIDTERM EXAM
Mar 13-17 SPRING BREAK NO CLASS			
Mar 24	Friday	WPH 106	Accident Management
Mar 31	Friday	WPH 106	Underwater Methods & Protocols
Apr 7	Friday	WPH 106	Dive Physiology, Hyperbaric Medicine
Apr 14	Friday	WPH 106	Rebreathers and Tech Diving
Apr 21	Friday	WMSC	Underwater Methods & Protocols II
Apr 22	Saturday	WMSC	TBA
Apr 23	Sunday	WMSC	TBA
Apr 28	Friday	WPH 106	TBA
May 8	Monday	WPH 106	FINAL EXAM, 2:00-4:00pm WPH 106 (can reschedule on individual basis if final conflicts with another course)