

SCIENTIFIC DIVING I

11:628:345, 3 credits

CLASS MEETING TIMES: Monday 5:40-10:00pm
CLASS LOCATION: Werblin Recreation Center, Busch Campus
CLASS METHOD: Classroom Lecture & Pool Sessions (class meets in person)

INSTRUCTORS: Debby Miller
EMAIL ADDRESS: Deborah.miller@rutgers.edu
PHONE NUMBER: 848-445-1337
OFFICE HOURS: Scheduled upon request

COURSE DESCRIPTION

This course provides students with the academic background, practical skill applications, and SCUBA diving training to become competent and confident divers. Training is conducted under the minimum standards of both the American Academy of Underwater Sciences (AAUS) and applicable recreational training agencies towards achieving AAUS Scientific Diving certification.

The course provides training in open water, advanced open water and rescue diver skills. Knowledge development and skills include dive safety, SAFE diving skills, diving physics, diving physiology, care and maintenance of equipment, diving fitness, dive planning, oxygen administration, CPR/First Aid, and introduction to scientific methods and science diving. These core elements cover the academic and practical skills application in a confined water (pool) environment. Training materials developed by the AAUS, the Professional Association of Diving Instructors (PADI), and the Divers Alert Network (DAN) are used for the academic components of the program.

Students who are not certified divers will complete the academics and confined water skill requirements for PADI Open Water Diver, PADI Advanced Open Water Diver, and PADI Rescue Diver. Open water certification dives are not included in the course. Opportunity to complete open water dives for certification will be offered June—October.

Certified divers will complete academics and confined water skill requirements for skill refreshers on current levels of certification and any additional level up to Rescue Diver. Divers certified at Rescue or above can select two of the following PADI Specialties: Peak Performance Buoyancy, Oxygen Provider, Underwater Naturalist, or Search & Recovery Diver.

Students successfully completing individual training components of the program will be eligible to proceed onto completing open water dive requirements for certification with PADI. In addition, divers will be eligible to meet DEMP certification with Divers Alert Network (DAN). Divers will also meet the prerequisite for Scientific Diving II and be eligible to apply for AAUS Scientific Diver certification after all AAUS requirements are met.

COURSE LEARNING GOALS and ASSESSMENT

Students completing this course will be able to:

1. Explain physical gas laws associated with pressurized gases used in diving.
2. Explain the physiology of diving, emphasizing but not limited to effects of nitrogen and oxygen under pressure.
3. Develop dive plans according to water movement, visibility, temperature, aquatic bottom compositions, and aquatic life.
4. Determine features, parts, and maintenance requirements for various types of scuba equipment.

5. Demonstrate the skills necessary to be a safe recreational scuba diver, including planning and executing safely a dive with a buddy, use of the recreational dive planner, lost buddy procedures, out of air/low on air emergencies, hand signals, and a pre-dive safety check.
6. Apply CPR, AED, basic first aid, and emergency treatment skills for recreational diving illness.
7. Identify the relationship of competent SCUBA knowledge/skills with scientific diving considerations for pursuit of Scientific Diver certification.

These goals will be assessed by demonstrated proficiency in both knowledge of course materials (homework assignments, quizzes, mid-term and final exams) and confined water applications (dive skills, in-water safety, and emergency management procedures). In addition, students will write a paper and make an oral presentation to the class and instructional staff. The paper and presentation will be independently researched and expand on course subject matter (such as dive equipment, diving modes, or science diving methods and techniques).

COURSE REQUIREMENTS

Prerequisite: Medical Statement with Medical clearance for SCUBA diving as needed.

Students must demonstrate satisfactory swimming ability, physical stamina, and emotional stability to instructor during the course.

Water Skills AAUS Certification Requirements:

Swim 200 yards/meters without swim aids

Tread water for 10 minutes

Swim 400 yards/meters in less than 12 minutes

Swim 300 yards/meters with mask, fins, snorkel

Swim underwater for 25 yards/meters without surfacing

Transport a passive person of equal size 25 yards/meters in the water

Participation in and completion of the course is required to obtain open water certification, however it does not grant or guarantee your certification.

COURSE MATERIALS & TEXTS:

1. American Academy of Underwater Sciences Training PowerPoint/PDFs (Sakai)
2. PADI Open Water Diver eLearning & Crew pack (digital)
3. DAN BLS: CPR & First Aid Manual (digital)
4. PADI Advanced Open Water manual
5. PADI Rescue Diver eLearning & Crew pack (digital)
6. PADI Specialty Manuals & DVD (as applicable)
7. NOAA Diving Manual Diving for Science and Technology 4th Edition (Sakai)
8. Rutgers Scientific Diving Manual (Sakai)

EQUIPMENT REQUIREMENTS

SCUBA diving is equipment-intensive. The equipment used is designed for life-support; there will be no compromise in this respect. Safety above all will be emphasized, with respect to both equipment and training. Students will complete a Medical Statement and may need to obtain a physician's release to participate in SCUBA.

All equipment is provided as part of the course. Students may use personal equipment, provided that it is appropriate for SCUBA and has proof of annual service (where applicable). Students will have the opportunity to purchase discounted equipment through the university equipment purchase program.

COURSE SCHEDULE, ASSIGNMENTS, READING

Class assignments and due dates will be posted on the course Sakai site. Late submission of assignments will lower student assignment grade.

Class 1	Introductions, Overview of Course, Paperwork
Class 2	Water & snorkeling skills
Class 3	Dive Equipment & HP Cylinders; Discussion on Paper & Class Presentations assignments
Class 4	Dive Equipment Assembly & CW 1/Skills Refresher 1
Class 5	Dive Physics
Class 6	CW 1/Skills Refresher 1
Class 7	Dive Physiology
Class 8	CW 2/Skills Refresher 2
Class 9	Dive Planning; Discussion on EAP
Class 10	CW 2 & 3/Skills Refresher 2
Class 11	Decompression Theory & Application
Class 12	CW 3-4/Skills Refresher 3
Class 13	Guest Lecture - DMCS
Class 14	CW 4-5/Skills Refresher 4
Class 15	Marine Conservation Presentations
Class 16	Underwater Navigation Skills & Tasks
Class 17	Intro to AAUS & Scientific Diving Regulations
Class 18	Buoyancy Skills & Equipment/Tools; 400 m swim
Class 19	Procedures for Scientific Diving; Intro to Sampling Methods & Data Collection
Class 20	Data Collection & Sampling Techniques
Class 21	Research Paper Presentations
Class 22	Data Collection & Sampling Techniques; Rescue Skills
Class 23	DAN CPR & AED Skills
Class 24	Rescue Skills - Tired Diver/ Panicked Diver; 25 m underwater swim
Class 25	DAN First Aid Skills;
Class 26	Rescue Skills - Distressed Diver UW; Surfacing Unresponsive Diver; 25m diver transport
Class 27	Emergency Assistance Plan Presentations
Class 28	Rescue Skills - Unresponsive Diver at Surface

IMPORTANT COURSE REQUIREMENTS

Participation, Assignments and Quizzes: Assigned reading should be done before class. Homework and quizzes are due at times to be announced in class or posted on Sakai. Late work or quizzes will not be accepted unless arrangements are made beforehand, in person (not by e-mail or voice mail), or a doctor's note stating the severity of your illness is provided. All written work handed in must be in your own words, even if you consult with other students or work in groups (see Rutgers Academic Integrity policy at <http://academicintegrity.rutgers.edu/academic-integrity-policy/>).

Reading Assignments and Homework

To succeed in this course, you should do all assigned textbook readings prior to class and review class notes and knowledge reviews regularly.

Late homework is not accepted. Students who must miss class on a due date can email the assignment by the start of class for full credit.

Participation and Attendance

Attendance is mandatory. Students earn credit for class attendance and participation. Students are

required to participate and perform the required skills. They are part of the course grade.

Arriving late, leaving early, cell phone use, as well as any other disruption of class will lower student attendance and participation grade and compromise certification.

Unexcused absences will result in a loss of participation credit; excused absences (i.e., those with acceptable documentation of an emergency) will not result in point loss. If you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

Regardless of excused absences, all diving performance requirements and written exams must be successfully completed to meet requirements for certification(s).

Quizzes and Exams

It is expected that students will check the course schedule and show up on time for exams the day they are given. No make-up exams will be given unless arrangements are made beforehand, in person (not by e-mail or voice mail) or a detailed doctor's note or other written evidence of an emergency at the time of an exam is provided.

Exam and Quiz Policy

Quizzes will be given during the first 20 minutes of class. Laptops will be allowed and required for in class quizzes.

AAUS quizzes must be passed with a grade of 80% or higher for AAUS certification. If students score below 80% they are allowed to make up the quiz. The first attempt of a quiz will be used to calculate the student's course grade.

For recreational certification(s) students need a grade of 75% or higher. If students score below a 75% they are allowed to make up the quiz or exam. The first attempt of a quiz or exam will be used to calculate the student's grade.

Mid-term and Final exams will take up one whole class meeting. All exams will be closed book/notes. The use of electronic devices is strictly prohibited during exams. A calculator may be used.

Makeup exams may be offered to students with emergencies, but only if they can provide acceptable documentation of the emergency (e.g., hospital admit slip, etc.).

COURSE GRADING

Grades will be based upon the total points that you obtain from the following areas: skills assessment, written assignments, in-class presentations, class discussions and participation, quizzes, and written exams. Assignments to be graded, including due dates and grade distribution/percent value of each assignment will be posted on the course Sakai site. Your total points will be divided by the total points for the class to determine final grade.

AAUS Homework & Quizzes	20%
Exams	20%
DAN/PADI Exams, Skills and Knowledge reviews	10%
Paper/Presentations & Class Participation	20%
Water Skills & Confined Water Skills	30%

BEHAVIOR

This is an experiential course, and the instructors expect that students will act responsibly whether in the classroom, pool side, or in the water. Disruptive behavior that interferes with other student's learning or compromises safety will result in suspension from class. All mobile phones, pagers, audio playing devices etc. are to be kept off during class periods. No browsing the internet, texting, or emailing is allowed during class.

POOL MAKE-UP POLICY

Due to the unique and critical nature of the confined water (pool) sessions requirements associated with scuba diving courses, the following make-up policy is in effect:

- The instructor will determine, consistent with the course syllabus, the need for any pool make-up and also will establish the deadline for that make up.
- The instructor will schedule the specific time for each make-up consistent with staff and student availability.
- Student cost for each make-up is \$20 per hour for a minimum of 2 hours per student, payable in advance.

CERTIFICATION INFORMATION

The course grade is separate from a diving certification. Certification is given through separate participation in the required open water dives for each certification. Certification performance requirements are evaluated by certifying Instructor(s) in accordance to PADI training standards. Certification dives with Rutgers require separate fees but include all required equipment. Certification dives can be completed between May—October based on available schedules.

ACADEMIC INTEGRITY POLICY

All students are expected to know and follow the academic integrity policy of Rutgers University. Violations include: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating violations of academic integrity. <http://academicintegrity.rutgers.edu/academic-integrity-policy/>. If you have any questions about this policy, please contact the instructor.

Students with disabilities requesting accommodations must follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full disability policies and procedures are at <https://ods.rutgers.edu/>

STUDENT-WELLNESS SERVICES:

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.