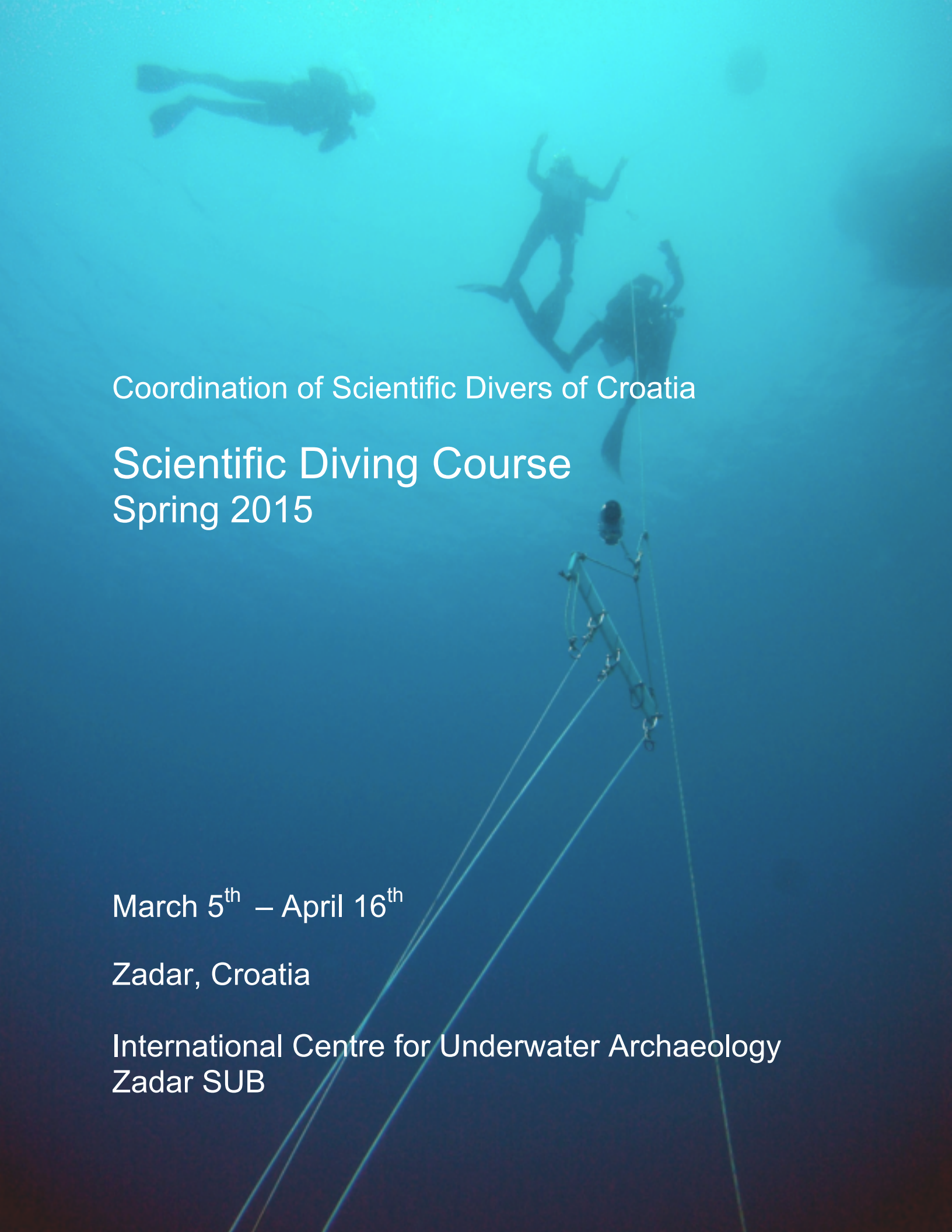


An underwater photograph showing three divers in the upper half of the frame. In the lower half, a crane or hoist system is visible, consisting of a metal frame and ropes, likely used for lifting heavy objects underwater. The water is a deep blue color.

Coordination of Scientific Divers of Croatia

Scientific Diving Course

Spring 2015

March 5th – April 16th

Zadar, Croatia

International Centre for Underwater Archaeology
Zadar SUB

Introduction

The Coordination of Scientific Divers of Croatia (CSDC) is offering a Scientific Diving Course in Spring of 2015 for students at the University of Zadar and members of the diving public. This course complies with the European Scientific Diving Panel (ESDP) Common Practices for Recognition of European Competency Levels for Scientific Diving at Work and the American Academy of Underwater Sciences (AAUS) Standards for Scientific Diving. Upon completion of all requirements, students will be certified through the Coordination of Scientific Divers of Croatia as an ESDP European Scientific Diver and as an AAUS Scientific Diver and can receive Verification of Training at organizations following ESDP and AAUS standards across EU countries and in North America. Students will gain diverse diving experience, participate in ongoing underwater research, and learn diving theory and methods in classroom sessions taught by experts in the field. Weeknight lectures and weekend dives over the six-week course will expose students to a variety of habitat types found along the northern Croatian coastline as well as the best practices for conducting hypothesis-based research, environmental survey, and archaeological methods.



The CSDC Scientific Diving Course is an intensive field experience teaching not only scientific diving techniques, but also team coordination and research project logistics. The course is a balance of practical methods application with academic lectures by experts in a small and relaxed class environment. The course is designed to expose students to interdisciplinary research along the northern Croatian coastline and offer opportunities for students to get involved in ongoing projects. Lecturers from partner organizations will teach about their areas of expertise and students will have the opportunity to visit both ecologically important and culturally significant sites. Practical experience will include underwater scientific methods as well as boat handling, operating compressors, equipment care, and other skills necessary for using scientific diving on marine projects. The 2015 Scientific Diving Course aspires to provide students with a well-rounded and interdisciplinary introduction to the wide range of diving methods and technology they will experience upon becoming professionals in the various disciplines of marine studies.

Pre-requisites and Cost

This course is designed to teach and develop underwater scientific diving skills for conducting academic and governmental research. Therefore, the following requirements must be met before the commencement of the course:

- Open Water certification from an internationally-recognized agency
- A minimum of 50 logged open water dives after initial diving certification
- Passed a diving medical physical exam in the previous 12 months (to ESDP/AAUS standards)
- Own your own skin and scuba equipment (cylinders and weights provided) and have had it serviced by an authorized service professional in the previous 12 months
- DAN Europe or equivalent diving insurance
- Adhere to the CSDC Diving Safety Program, ESDP Common Practices, and AAUS Standards for Scientific Diving



The Scientific Diving Course tuition covers registration in the Coordination of Scientific Divers of Croatia database, all certification cards and course materials, use of the lecture and courtyard facilities at the International Centre for Underwater Archaeology, use of underwater sampling equipment, cylinder use and air fills, and boat use for scheduled dives.

To apply, please use our online application system at <http://csdcroatia.wix.com/csdc>. As part of the application process, you will also need to prepare a cover page explaining your qualifications as a candidate and a current CV that includes relevant diving certifications and previous experience. Students may be asked to provide contact information for two references and evidence of good standing at the university (if enrolled).

Course

The Scientific Diving Course runs for six weeks with academic lectures on weeknights and diving operations on the weekends. The course will be taught in English, though individuals with English as a second language are encouraged to apply.

Students will be taught diving safety protocols and expected to strictly follow all measures. Divers may abstain from any dive without reprimand and given a new “dry” task with no detriment to their course outcome (although a minimum number of 20 dives is required for certification as an AAUS and ESDP Scientific Diver). Students will be expected to update dive records and an ecological field notebook with observations daily.



Students will learn numerous practical scientific diving and experimental methods. Navigation/search and light salvage techniques, habitat quantification, invertebrate and fish population assessment, deeper diving and night diving considerations, enriched air nitrox, blue water diving protocols, and equipment operation and repair are included. Our unique location also allows the introduction of underwater archaeological techniques such as artifact recording and identification, photography, drawing, and the use of scales and labels. Students will gain hands on experience conducting surveys at a variety of habitats and archaeological sites. We will also certify students in the Divers Alert Network Diving First Aid for Professional Divers, which includes First Aid, CPR, AED, Hazardous Marine Life, and Emergency Oxygen administration.

Academic coursework will include diving physics and physiology, decompression theory and planning, emergency dive accident management, enriched air nitrox, coastal ecology, and oceanography.

Evaluation:

Students will be evaluated based on skin and scuba diving skills, a Rescue and Nitrox exam, a final exam, a presentation, and (most importantly) attitude. Completion of all required skills and exams is necessary for certification as an AAUS and ESDP Scientific Diver.

Course Staff

Luka Bekić, Ph.D.
Director, *International Centre for Underwater Archaeology*

Claudia Kruschel, Ph.D.
Faculty, *University of Zadar*

Jessica Nordstrom
Diving Safety Program Specialist, *Illyrian Coastal Exploration Program*

Lee Pape
Diving Safety Officer, *Illyrian Coastal Exploration Program*

Mladen Pešić
Training Coordinator, *International Centre for Underwater Archaeology*

Martin Sayer, Ph.D.
President, *European Scientific Diving Panel*

Marina Šimičić
Archaeologist, *International Centre for Underwater Archaeology*

Derek Smith
Diving Safety Officer, *Coordination of Scientific Divers of Croatia*

Saša Stipanić
Owner, *Zadar SUB*

Materials List (included in tuition cost):

NAUI Master Diver Text
NAUI Nitrox Diver Package
NAUI Dive Table
DAN Diving First Aid for the Professional Diver Text
Underwater Slates and Datasheets
Eezy-Cut Trilobite Knife

ESDP European Scientific Diver Card
AAUS Scientific Diver Card
NAUI Nitrox Diver Certification Card
DAN Diving First Aid for the Professional Diver Certification Card

Course Schedule

Green lettering indicates academic lecture sessions

Blue lettering indicates in-water sessions

Thursday, March 5th

Classroom 1: Introductions and paperwork

Classroom 1:

Orientation & Paperwork

Required Equipment Review

Intro to Scientific Diving, AAUS, ESDP, and the ICUA Diving Safety Program

Saturday, March 7th

Diver-In-Training Swim/Skin/Scuba tests

Swim tests:

Swim tests (swim suits only, no equipment except swim goggles):

- 400 m in under 12 minutes
- 25 m U/W on one breath
- 10 minute tread
- 50 m transport of unconscious victim

Skin diving skills (wetsuits, masks, fins, snorkels, weight belts):

- Entries x3 (giant stride, forward roll, backward roll)
- Surface dives x2 (pike, tuck)
- Tired diver assists x3 (do-si-do, fin push, knee push)
- Stressed/panicked diver assist
- Rescue breathing with 100yd transport

Scuba skills/checkout (all scuba equipment):

- All gear remove/ replace (at surface)
- Mask remove/replace (at depth)
- Regulator recovery x2 (sweep, tank lift)
- Weights remove/replace (at depth)
- Buddy breathing (donor and recipient)
- Alternate air sharing (donor and recipient)
- Controlled Emergency Swimming Ascent
- Bailout (all gear off out of the water, jump in with all gear and replace at depth)

Sunday, March 8th

Openwater 1: Diver-In-Training (DIT) Skin/Scuba diving skills checkout

Openwater 1:

Dive 1: Scuba skills/checkout

- All gear remove/ replace (at surface)
- Mask remove/replace (at depth)
- Regulator recovery x2 (sweep, tank lift)
- Weights remove/replace (at depth)
- Buddy breathing (donor and recipient)
- Alternate air sharing (donor and recipient)
- Controlled Emergency Swimming Ascent

Dive 2: Orientation dive/Intro to historical site formation

- Marine life identification
- Artifact identification

Week of March 9th – 13th

Classroom 2: Emergency response training/Rescue 1

Classroom 2:

CPR/AED scenarios (1, 2 rescuer adult), Obstructed airway, Barrier devices

Emergency Oxygen Administration, 4-Minute Neuro Exam; O2 Equipment, Evacuation, HBOT

Safety, Liability, and Risk Management; Dive Planning Protocols; Stress ID and Management; Rescue and Assists

Classroom 3: Standard First Aid, Rescue 2

Classroom 3:

Standard First Aid; Emergency Scenarios, Emergency Dive Accident Management

Saturday, March 14th
Openwater 2: Dive Rescue

Openwater 2:

Rescue skills:

- One person, two person, multiple person carries (beach extraction)
- Diving accident management scenarios and considerations
- Boat extraction techniques

Dive 3: Rescue dive skills

- Full rescue of unconscious diver from the bottom, including rescue breathing and transport at surface, extraction to small research vessel

Dive 4: Rescue dive skills

- Various rescue scenarios

Sunday, March 15th
Openwater 3: Navigation, Search, and Light Salvage

Openwater 3:

Dive 5: Navigation techniques

- Measuring distance using fin cycles/time/psi
- Reciprocal course
- Expanding square

Dive 6: Search patterns, light salvage

- Circle and semi-circle search
- Using small tools, assemble puzzle pieces
- Lift bag usage

Week of March 16th – 20th
Classroom 4: Dangerous marine organism First Aid

Classroom 4:

Identification, prevention, and treatment of various marine life injuries

Classroom 5: Rescue Exam

Classroom 5:

Rescue Exam

Saturday, March 21st

Openwater 4: Habitat Mapping

Openwater 4:

Dive 7: Habitat mapping

- Survey methods
- Locating and marking objects and sites

Dive 8: Habitat structure and quantification (cont'd)

- Deployment of transects
- Site recording techniques

Sunday, March 22nd

Openwater 5: Habitat Structure and Quantification

Openwater 5:

Dive 9: Habitat structure and quantification

- Meter tape usage
- Band transects
- Quadrat usage (UPC, % cover)
- RPC usage
-

Dive 10: Habitat structure and quantification (cont'd)

- Meter tape usage
- Band transects
- Quadrat usage (UPC, % cover)
- RPC usage

Week of March 21st – 25th

Classroom 6: Equipment

Classroom 6:

Cylinders, valves, cylinder hazmat/handling, gauges

Regulator mechanics, maintenance, troubleshooting and field repair

Classroom 7: Oceanography

Classroom 7:

Beaches, currents, tides, waves, wind, geology, global awareness

Saturday, March 28th

Openwater 6: Size estimation

Openwater 6:

Dive 11: Size estimation

Dive 12: Size estimation

Sunday, March 29th

Openwater 7: Assessing Fish Populations

Openwater 7:

Dive 13: Fish counts

- Transect-driven assessment (2 m x 2 m x 30 m)

Dive 14: Fish counts

- Roving diver assessment (60min, graded)

Week of March 30th – April 3rd
Classroom 8: Diving Physics

Classroom 8:

Light and vision, sound, temperature, buoyancy, pressure, Boyle's Law, gas consumption

Physics indirect effects: air composition, hypoxia, SWBO, Dalton's Law (partial pressure) and Henry's Law (solubility), immersion effects

Classroom 9: Diving Physiology

Classroom 9:

Direct effects of pressure, anatomy and diving, CO₂, CO, CNS and pulmonary oxygen toxicity, nitrogen narcosis

Decompression theory, dive tables, dive computers

Saturday, April 4th
Openwater 8: Archaeological survey methods

Openwater 8:

Dive 15: Site mapping and measurements

Dive 16: Artifact documentation

Week of April 6th – 10th
Classroom 10: Enriched Air Nitrox

Classroom 10:

Introduction to nitrox, nitrox equipment considerations, nitrox production methods, analysis and documentation

Nitrox dive planning: "Safe Air" method; nitrox dive planning: EAD method; nitrox dive tables and planning

Classroom 11: Nitrox Exam

Classroom 11:

Nitrox Exam

Saturday, April 11th

Classroom 12: Deeper diving techniques

Openwater 9: Deeper Diving, Night Diving

Classroom 12:

Deeper diving techniques/hazards, Night diving techniques/hazards, Nitrox review and plan for dives

Openwater 9:

Dive 17: Deep dive

- Habitat assessment
- Safety considerations using Nitrox

Dive 18: Night dive

- Fish counts
- Safety considerations at night

Sunday, April 12th

Openwater 10: Blue water rig

Openwater 10:

Dive 19: Blue water rig

- Equipment overview
- Safety considerations
- Collecting/transects

Dive 20: Blue water rig

- Equipment overview
- Safety considerations
- Collecting/transects

Week of April 13th – 17th

Classroom 13: Scientific diver exam

Classroom 13:

Scientific diver exam

Classroom 14: Intro to technical diving, Student presentations

Classroom 14:

Intro to technical diving/rebreathers, student presentations, return scientific diver exam

