

UNMANNED MARITIME SYSTEMS CERTIFICATE PROGRAM

Autonomous vehicles are becoming increasingly involved in routine, innovative, and emergency data collection in the marine environment yet few curricula exist worldwide to train operators for this equipment. This certificate will provide students with a working knowledge on the operation of a variety of autonomous marine survey vehicles and to help them to understand the environment in which vehicles operate and how that environment factors into decisions and mission planning.

UMS CERTIFICATE PROGRAM — TIER 1

Students will learn foundational material in oceanography and ocean engineering related to unmanned undersea and surface vehicles (UUVs and USVs), such as powered gliders. This 10-credit hour program compressed into five weeks of instruction is intended to provide sufficient background to safely operate vehicles in challenging marine environments.

Prior to operating with vehicles, students will work with individual electronic workstations and glider kits to provide them with the necessary background knowledge in electronics, materials, batteries and connectors. They will also work with a variety of sensor systems, including ADCPs, CTDs, cameras, fluorometers, and several types of sonars and other acoustic gear.

The UMS Certificate program consists of three courses and one lab, as well as several hours of basic field work during which students will program, launch, monitor, and recover several types of unmanned systems.

PLAN OF STUDY – UMS CERTIFICATE (Foundational)

- MAR 431 Basic Marine Instrumentation (3 hours)
- MAR 434 Operating Instrumentation in Marine Environments I (3 hours)
- MAR 433 Marine Autonomous Vehicles (3 hours)
- MAR 433L Marine Autonomous Vehicles Lab (1 hour)

UMS OPERATOR CERTIFICATE PROGRAM — TIER 2

In this follow-on curriculum students will delve into ocean science and engineering topics, including characteristics of specific platforms and sensors, physical environmental factors affecting UMS in both operational and research and development settings. The curriculum draws knowledge from real-world case studies of specific situations, sensors, and platforms. Students will apply these concepts in developing and conducting operations during a short field project.

The UMS Operator Certificate program consists of four courses totaling 12 credit hours compressed into five weeks of instruction including a field project during which students will conduct mission analysis & planning, specific vehicle and sensor matching, specific vehicle preparation, launch, operation, and recovery, followed by quality review of collected data.

PLAN OF STUDY – UMS OPERATOR CERTIFICATE (Advanced)

- MAR 435 Operating Instrumentation in Marine Environments II (3 hours)
- MAR 436 UMS Vehicle Planning (3 hours)
- MAR 438 UMS Vehicle Management (3 hours)
- MAR 440 UMS Field Project (3 hours)