

STUDENTS WILL

- Evaluate the specific requirements of a given mission, consider the environmental limitations, and select the appropriate hardware for the task;
- Read schematics, assemble electronic components, and program micro-controllers similar to those used in modern undersea vehicles;
- Determine and adjust the ballast and trim of several types of autonomous undersea vehicles under varying conditions;
- Troubleshoot failures in cables, connectors and simple electronic components; and
- Plan a glider or powered vehicle mission and write the operational program with which to execute it.



ADMISSIONS

For all admission applications (undergraduate, graduate or international), go to usm.edu/admissions.

PROGRAM INFORMATION

usm.edu/ocean-science-engineering/unmanned-maritime-systems-ums-certification.php

FIND US ON FACEBOOK.

USM School of Ocean Science and Engineering

Standards, Skills, and Experiences for Autonomous Ocean Exploration and Understanding



FOR MORE INFORMATION, CONTACT
UNMANNED MARITIME SYSTEMS CERTIFICATE PROGRAMS.
PHONE: 228.688.3177 • FAX: 228.688.1121



THE UNIVERSITY OF
**SOUTHERN
MISSISSIPPI.**

SCHOOL OF OCEAN SCIENCE AND ENGINEERING

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EOE/EF/AF/VE/VS/DF/ABILITY

UNMANNED MARITIME SYSTEMS

CERTIFICATE PROGRAMS

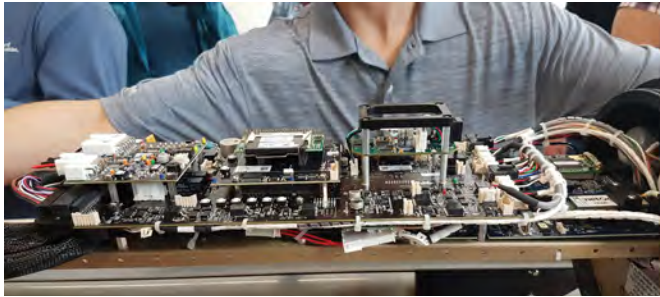


UMS CERTIFICATE – TIER 1
UMS OPERATOR CERTIFICATE – TIER 2

FOLLOW IN THE FOOTSTEPS OF GREAT EXPLORERS TO THE FAR DEPTHS OF THE OCEAN!

Competency at the leading edge of innovation in ocean science and engineering

Autonomous vehicles are transforming knowledge of the ocean and enabling unprecedented performance and efficiency, but only if their operation is properly understood and utilized. These undergraduate Certificate programs provide students with a working knowledge on the operation of a variety of unmanned maritime systems (UMS), helping them understand the marine 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,

STATE-OF-THE-ART FACILITY

Classes are held at USM's Marine Research Center (MRC) at the Port of Gulfport. Lectures are held Monday through Friday from 9 a.m. until 5 p.m.



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)



The emphasis of the UMS Certificate programs includes the following:

DECISION MAKING

- Which vehicle is right for this mission?
- What environmental conditions need to be considered?

TROUBLESHOOTING

- Why is it doing that?
- Why is it not moving?
- Why isn't it communicating?

MISSION PLANNING

- How and where will the vehicle be deployed?
- How will it navigate?
- How will it be monitored?
- Is it possible to intervene during the mission?
- How will it be recovered?

Students will be provided with the opportunity to work with various vehicles including USM's ISE Explorer class, Seabed, L3OceanServer Iver, BAE Systems Riptide, and Aquabotix underwater vehicles, both Teledyne-Webb and HII-Hydroid ocean gliders, plus L3Harris C-Worker 5 and Seafloor Systems EchoBot unpowered surface vessels outfitted with the latest mapping sonars and precision navigation equipment.

