

# Fall 2024 Undergraduate Program Director (UPD) Report

Victoria Samuel - 12/2/2024 12:23:06 AM -05:00

## Received

Date:

By:

Comment:

## Instructions

This is a form for SEBS Governing Council major representatives. The purpose of this form is to encourage student engagement with faculty/department representatives and to identify academic issues that may be addressed by the council.

1. Talk to students in your major, ask around if there are any current academic issues (ex: class conflicts within the major, issues with professors or department, lack of resources).
2. Look at Degree Navigator, write down the course requirements
3. Formulate a list of things you would like to know about the program (corporate connections with the university, current research projects, opportunities for students to get involved, recent changes to the program)
4. Email Undergraduate Program Director and Arrange Appointment
5. Fill out this form and submit by 11:59pm on November 17th, 2024.

n/a

## General Information

Your Name

Victoria Samuel, Jake Lindmark

Your Email

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Represented Major

Marine Science

Date of Meeting with UPD

11/27/24

Class Year

2027, 2028

UPD Name

Dr. Silke Severmann

UPD Email

upd@marine.rutgers.edu

Major/Departmental Website Link (if applicable)

<https://marine.rutgers.edu>

## Major Information

Major Options -- What options are offered within the major? How do they differ?

Marine Biology/Biological Oceanography- Focuses on biological organization at the molecular, cellular, organismic, community, and ecosystem level. Marine Chemistry- Focuses on the chemistry of the ocean at the interface of biology, geology, and physics. Physical Oceanography- Focuses on large scale ocean circulation, coastal systems, ocean observing technologies, and ocean-climate modeling. Marine Geology- Looks at aspects of geology, such as sedimentology, mineralogy, geophysics, structural geology, hydrogeology, and the evolution of the Earth's ocean and atmosphere. Directed Marine Studies- This option resembles the Marine Biology option but includes a requirement to complete a minor or certificate program that facilitate employment following graduation.

Total Number of Students within the Major (estimate if unknown from UPD)

## Goals within the Major -- What are expectations of students post-graduation?

1. Master the basic biological, chemical, physical, and geological principles of marine science. 2. Analyze and interpret contemporary oceanographic datasets. 3. Show evidence of scientific literacy, and communicate the information effectively both orally and in writing. 4. Develop, conduct, and report on an applied research experience in marine science in collaboration with a scientific mentor. 5. Evaluate contemporary global issues and the ethics of how the ocean's resources are used. Overall the major is meant to prepare students for working in fields concerning the marine or environmental sciences and graduate studies in oceanography or another scientific field.

## List Upper-Level major courses -- What is the goal of each course?

11:628:402 The Role of Polar Regions in the Earth System- Goal is to build on fundamental physical and biological principles to understand the links between the cryosphere, ocean, atmosphere and biosphere in the polar regions. 11:628:405 Molecular Microbial Oceanography- Goal is to highlight emerging efforts to explain the activity, diversity, and evolution of microbial genes and link them to key oceanic ecosystem and biogeochemical processes. 11:628:410 Biophysical Interactions: From Barnacles to Jellyfish- Goal is to understand how organisms interact with and are affected by their physical fluid environment. And to introduce fundamental principles of major topics, including life at low Reynolds numbers, benthic boundary layers, biomechanics, and diffusion and dispersal. 11:628:451 Physical Oceanography- Goal is to introduce students to the important physical processes in the oceans and develop the basic equations which describe the principles upon which physical oceanography is based. 11:628:452 Geophysical Data Analysis- Goal is to analyze of equally and unequally spaced data with an emphasis applied data analysis. 11:628:461 The Biology of Living in the Ocean: Water Column Ecosystems & Processes- Goal is to understand the processes that regulate the biology of the plankton and fish, which drives the community ecology for ocean ecosystems and highlight approaches and technologies used to make measurements in the ocean. 11:628:462 The Biology of Living in the Ocean: Boundary Ecosystems and Processes- Goal is to cover the processes that regulate the biology, productivity, and population and community dynamics at the boundaries of the ocean, including intertidal zones, estuaries, salt marshes, coral reefs, hydrothermal vents, and the sea floor. 11:628:472 Chemical Oceanography- Goal is to teach students how to apply basic chemical concepts to understand the biogeochemical cycles and distributions of chemical constituents in the ocean. 11:628:474 Coastal Biogeochemical Cycles in a Changing World- Goal is to explore important concepts in marine chemistry in the coastal zone and nearshore sediments and investigate how the disciplines of chemistry, biology and geology are used to understand marine processes in the coastal zone. 11:628:476 History of the Earth System- Goal is to examine climatic processes on geological time scales, the evolution of organisms, the cycling of elements, and the feedbacks between these processes. 11:628:497 and 498 Special Problems in Marine and Coastal Sciences- Students can take Special Problems in Marine Sciences at any stage during their degree. Students can work with a faculty member they reach out to in the department students or do an independent research project or internship at an external institution.

## Student Issues

### Are there concerns with classes within the major? Are there any suggestions for solutions to these concerns?

-Calculus II for the Life and Social Sciences (01:640:136) is no longer being offered for the foreseeable future. Current solutions to this problem are taking an alternative to this class, such as higher level statistical courses or Numerical Methods in Environmental Science (11:375:303). Another solution would be potentially removing the Calculus II requirement altogether. -Another concern is the lack of General Biology I and II (01:119:115/116) sections, which are prerequisites to many marine science classes. The solution is to offer more sections of these two classes. -Some classes are offered every other year, so students should take note of the ones they may be interested in and plan accordingly.

### From the perspective of the UPD or other major faculty members, what can currently be improved upon in the major or department? Are there any suggestions for solutions to these issues?

-One thing that needs improvement is the outdated curriculum though there are potential plans to overhaul it. -There is an uneven distribution between the different tracks within marine science, considering most take the marine biology track, so solutions are to simplify the amount of them and also make it easier to move between the tracks. -Currently, the department is short on faculty for the fisheries minor, but there are hopes to turn the fisheries minor into a major. -As there have been a few retirements within the marine chemistry concentration, faculty hires are also something that needs to be improved.

### Are there any Visitor Events/Talks/Seminars/etc. going on within the major?

-Members of the marine science department usually partake in open houses and research mixers throughout the year. -Public engagement and outreach to promote STEM topics in high schools and community colleges is led by Janice McDonnell. -There is a weekly seminar series open to undergraduates every Monday! There are also individual tours that are given out within the Marine and Coastal Sciences Building and talks that members of the department give in places such as the Liberty Science Center. -And make sure to look out for open houses held by field stations associated with Rutgers, like the one in Tuckerton, NJ or the Delaware Estuary.

### Suggestions for students in this major (ex: organizations to join, news to pay attention to)

First and foremost as a marine science student make sure to follow a reliable news source. In addition to this, there are societies one can join to become more connected with others within the field such as the Association for the Sciences of Limnology and Oceanography (ASLO), the Geological Society, or the Oceanography Society which often hold annual meetings that undergraduates can attend. Lastly, for those interested in research experience, look into partaking in a program through the Aresty Research Center.

### Changes within the major for the upcoming year

Though these changes may not be as immediate as the upcoming year, changes that should be coming include more marine-specific electives. In addition to this, streamlining the curriculum by removing or replacing some of the tracks and

identifying/fixing courses that are difficult to take due to their prerequisites are changes that should be seen in the future.

Any other suggestions, comments, concerns?

The marine science program is small, but it brings in many funds for research and opportunities. There is a big push to admit more students into Rutgers, which could affect research being done, so the balance between professors teaching and leading research has to be made.