Export to PDF Export to Word

Add Comment

In Workflow

- **1. APA Coordinator Programs**
- 2. Catalog Coordinator
- 3. Library Evaluation
- 4. Space Evaluation
- 5. 14 Day Review
- 6. Robert Wheatcroft (College of Earth, Ocean & Atmospheric Sciences, Professor)
- 7. APA Undergraduate Assessment
- 8. 24 College Committee Approver
- 9. 24 Dean
- **10. APA Coordinator Programs**
- 11. Robert Wheatcroft (College of Earth, Ocean & Atmospheric Sciences, Professor)
- 12. Budgets and Fiscal Planning Committee Chair
- **13. Curriculum Council Co-Chairs**
- **14. Executive Committee**
- 15. Faculty Senate
- 16. Provost Designee
- 17. OSU Board of Trustees
- 18. Statewide Provosts' Council Chair
- 19. HECC
- **20.** NWCCU
- 21. Catalog Coordinator

Approval Path

- Wed, 14 Apr 2021 16:30:19 GMT Janice Nave-Abele (Academic Programs & Assessment, Curriculum Coordinator) (janice.nave-abele): Approved for APA Coordinator Programs
- Thu, 22 Apr 2021 03:43:10 GMT Belinda Sykes (Office of the Registrar, Catalog & Curriculum Coordinator) (belinda.sykes): Approved for Catalog Coordinator
- Thu, 13 May 2021 21:45:03 GMT Kerri Goergen-Doll (Library, Collections, Cataloging, Acquisitions & Resource Sharing Director) (kerri.goergen-doll): Approved for Library Evaluation
- Thu, 20 May 2021 23:09:35 GMT David Jacobs (Capital Planning & Development, Manager - Space Allocation) (david.jacobs): Approved for Space Evaluation

5.	Fri, 04 Jun 2021 08:56:55 GMT
	0/1 votes cast.
	Yes: 0% No: 0%
	Approved for 14 Day Review

- Fri, 04 Jun 2021 16:33:20 GMT Robert Wheatcroft (College of Earth, Ocean & Atmospheric Sciences, Professor) (rob.wheatcroft): Approved for wheatcrr
- 7. Thu, 10 Jun 2021 13:23:48 GMT
 Heath Henry (Academic Programs & Assessment, Assessment Coordinator) (heath.henry): Approved for APA Undergraduate Assessment
- Thu, 10 Jun 2021 14:38:30 GMT Michael Harte (College of Earth, Ocean & Atmospheric Sciences, Professor) (michael.harte): Approved for 24 College Committee Approver
- Thu, 10 Jun 2021 14:57:44 GMT Roberta Marinelli (College of Earth, Ocean & Atmospheric Sciences, Dean) (roberta.marinelli): Approved for 24 Dean
- 10. Thu, 10 Jun 2021 16:16:43 GMTJanice Nave-Abele (Academic Programs & Assessment, Curriculum Coordinator) (janice.nave-abele): Approved for APA Coordinator Programs
- 11. Thu, 10 Jun 2021 17:24:07 GMT Robert Wheatcroft (College of Earth, Ocean & Atmospheric Sciences, Professor) (rob.wheatcroft): Approved for wheatcrr
- Wed, 30 Jun 2021 17:23:07 GMT Amy Bourne (College of Business, Senior Instructor II) (amy.bourne): Approved for Budgets and Fiscal Planning Committee Chair
- 13. Tue, 02 Nov 2021 00:17:53 GMT Inara Scott (College of Business, Assistant Dean for Teaching & Learning Excellence, and Curriculum Council Co-Chair) (inara.scott): Approved for Curriculum Council Co-Chairs

New Program Proposal

Date Submitted: Wed, 07 Apr 2021 18:11:13 GMT

Viewing: : Oceanography Undergraduate Major (BS, HBS)

Last edit: Mon, 08 Nov 2021 20:00:56 GMT

Changes proposed by: wheatcrr Effective Term Summer 2022 Justification

When did this program last have student enrollment? laststudentenrollment (Last Student

Enrollment)

Explain how the academic unit's current objectives, functions, and/or activities will change. Address issues such as course offerings, student learning outcomes and experiences, and how the advising structure and availability will be changed. Describe the extent to which affected faculty and staff support this change.

Objectives, Functions, and Activities: obj_func_act (Provide Objectives, Functions, and Activities:)

How will the change support OSU's mission, vision, and goals?

Mission: mission (Mission:)

Describe the potential positive and negative impacts of the change. Identify other OSU programs or units which might be affected and describe the impact on their mission and activities.

Impact: missionposneg (Impact:)

Describe how the proposal will affect the long-range strategic goals and plans for the academic program(s) or academic unit(s). Compare with OSU's current strategic plan and its three signature areas of distinction.

Strategic Plan: strat_plan (Strategic Plan:)

What is the relationship with constituencies outside of OSU (e.g., federal state, local, private) and other institutions in Oregon? Describe how this relationship might be altered.

External Impacts: external_impacts (External Impacts:)

If the academic program is professionally accredited, identify the accrediting body and describe how the proposed change may affect accreditation.

Accreditation: delete_accreditation (Accreditation:)

External Letters of Support

Organizational Chart

Budget Worksheet and Narrative

Curriculum Notification

Proposal

Effective Term Summer 2022

Type of Change

Justification

The College of Earth, Ocean, and Atmospheric Sciences (CEOAS) proposes the creation of a new Bachelor of Science degree in Oceanography. The new degree will replace the existing B.S. degree in Earth Sciences, Ocean Science Option. The Earth Sciences degree currently has three options: Climate Science, Geology, and Ocean Science. Climate Science and Geology have been proposed as standalone B.S. degrees in separate proposals that are currently under review.

The primary justification for the change in name and elevation to a standalone B.S. degree is that it will provide greater visibility to potential students who have indicated some difficulty in finding the option, and it will allow us to develop a more student-centered curriculum that better prepares graduates for the workforce. It will also more clearly distinguish between other ocean-related programs at Oregon State (e.g., Fisheries & Wildlife, Marine Biology, Marine Studies).

Primary Originator

Name

Robert Wheatcroft (College of Earth, Ocean & Atmospheric Sciences, Professor) Julie Barlow (College of Earth, Ocean & Atmospheric Sciences, Administrative Program Assistant)

Liaisons

Academic Unit

Chemistry (CH) College of Earth, Ocean & Atmospheric Sciences - Undergraduate (ATS, GEO, GEOG, OC) College of Engineering - Undergraduate (ENGR, OP) College of Liberal Arts (LA, MAST, SSCI) Environmental Sciences - Undergraduate (ENSC) Fisheries & Wildlife Sciences (FW) Integrative Biology (BI, IB, Z) Mathematics (MTH) Microbiology (BHS, GS, MB) Honors College (HC) Physics (PH) School of Civil & Construction Engineering (ARE, CE, CCE, CEM) Statistics (ST) College of Agricultural Sciences (AGRI, BRR, IAWS, SUS) Forest Ecosystems & Society (FES, MNR, NR, SNR, TRAL)

Program Information

Program Level Undergraduate

Program Type Major / Degree

Are you renaming this program?

No

Are you reorganizing this program?

No

Are you extending this program to Ecampus?

No

Are you changing the location of this program? (select no for Ecampus)

No

Program Name Oceanography Undergraduate Major (BS, HBS)

New Name (for renamed program)

Program (SIS) Code

CIP Code 303201 - Marine Sciences.

College Earth, Ocean & Atmospheric Sciences (24)

Academic Unit Oceanography

Is this program jointly administered?

No

If this program is administered jointly, indicate the other college or academic unit/s

Date the Early Alert was submitted for this proposal 10/15/2020

What degree types are available for this undergraduate program?

Bachelor of Science (BS/HBS)

List other degree type/s

What degree types are available for this graduate or professional program?

Select other degree type

List other degree type/s

Is this certificate available as standalone?

Do you want this standalone certificate to be eligible for financial aid?

Campus Locations

Corvallis

Other Location

Is this program currently or planned to be offered in hybrid format?

No

Explain the format

Will this program lead to professional licensure in any U.S. state or territory?

No

List the type of professional licensure/s

Program Relationships

Attached Major(s)

Are all degree types and options (if applicable) available at all locations?

Yes

List the programs available at each location

Does this program use a pre/pro school model?

No

Pre-Major (SIS) Code

Does this program use an alternative admissions process or have grade/GPA standards that are different from the university minimum?

No

Explain the grade/GPA standards

Does this major have options?

No

Select Options

Is completion of an option required to earn the major?

Explain the relationship

Executive Summary

Executive Summary

The College of Earth, Ocean, and Atmospheric Sciences (CEOAS) proposes the creation of a new Bachelor of Science degree in Oceanography. The new degree will replace the existing B.S. degree in Earth Sciences with an Ocean Science Option. The Earth Sciences degree currently has three options: Climate Science, Geology, and Ocean Science. Climate Science and Geology have been proposed as standalone B.S. degrees in separate proposals that are currently under review.

The Bachelor of Science in Oceanography is a four-year degree that prepares students to

understand the ocean in its totality, from the large-scale structure of ocean basins and their history to the inter-related biological, chemical, geological, and physical processes that shape its current behavior and future evolution in the face of myriad human-related pressures. Based on long-standing strengths within the College of Earth, Ocean, and Atmospheric Sciences in the areas of biological, chemical, geological and physical oceanography as well as allied disciplines (e.g., climate science, geography, geology) the program provides a rigorous, interdisciplinary curriculum that will prepare students for careers in applied ocean science, environmental sciences, science education and research, or the pursuit of a graduate degree in oceanography and related fields.

Oceanographers contribute to society through the sustainable management of living and nonliving marine resources, recognition and mitigation of natural hazards (e.g., sea level rise, harmful algal blooms), and environmental remediation of human impacts (e.g., hypoxia, plastics pollution). Experiential learning lies at the core of an oceanographer's education in CEOAS and practical experiences are integrated throughout the curriculum. This program takes advantage of OSU's world-class faculty for undergraduate teaching and advising, our state-of-the art research infrastructure in oceanography; and provides an opportunity to attract motivated students to a signature program that trains future ocean science leaders.

Suspend or Terminate a Degree

Do you wish to suspend this program for three years or terminate it permanently?

When did the program last have student enrollment?

Explain how the academic program(s) or academic unit(s) current objectives, functions, and/or activities will change. Where applicable, address issues such as course offerings, program requirements, admission requirements, student learning outcomes and experiences, and how the advising structure and availability will be changed as a result of this proposal.

How will the proposed change to the academic program(s) or academic unit(s) support OSU's mission, vision, and goals?

Describe the potential positive and negative impacts of the proposed changes on the academic program(s) or academic unit(s) involved. Identify other OSU programs or units which might be affected, and describe the potential positive and negative impact on their mission and activities

Describe how the proposal will affect the long-range strategic goals and plans for the academic program(s) or academic unit(s). Compare with OSU's current strategic plan and its three signature areas of distinction

What is the current relationship with other higher education institutions in Oregon? Describe how this relationship might be altered based on the proposed change

If the academic program is professionally accredited, identify the accrediting body and describe how the proposed change may affect accreditation

Proposal for Delivery of an Existing Program to a New Location

Program Description

Include the name of the institution program coordinator

Indicate in what ways the proposed program at the new location(s) will differ from the on campus program

List any special requirements or prerequisites for admission to the program at the new location(s)

If accredited, what steps would be needed to accredit the program at the proposed new location(s)?

Provide evidence of consultation with other public universities regarding non-duplication of similar programs offered in the same region, or ones that will cause undue hardship to another public university

Demand

List any similar programs offered at the proposed or nearby location(s)

Provide evidence of need for the program at the new location(s)

Estimate enrollment and number of graduates over the next five years. Will any enrollment limitation be imposed? If so, how will those to be enrolled be selected?

Personnel

List qualifications of faculty (regular and/or adjunct) who will be involved in delivering the program to the proposed location(s)

I will provide individual CVs if requested by Faculty Senate Curriculum Council

Estimate the number and type of support staff needed to provide the program at the new location(s)

Other Resources

Describe facilities (e.g., buildings, labs, equipment) necessary to offer the program at the new location(s)

Indicate how library needs will be met

Indicate how students at the new location(s) will receive student services (e.g., academic advising, financial aid assistance, course registration, access to book/text purchases)

Alternative Delivery Methods/Formats

Are alternative delivery methods being used (e.g., distance learning or technologyenhanced)?

Will this program be delivered in an alternative format (e.g., weekend, evening, on-site)?

40-Mile Radius Rule

"Significant change" to a university's academic program includes, but is not limited to, any new undergraduate or graduate degree program, or any existing undergraduate or graduate degree program that will be offered more than 40 miles from the site at which it is currently offered. "Significant change" to a university's academic program does not mean a new undergraduate or graduate certificate program, new minor, or a new name for an existing degree program. Source: Oregon Administrative Rules (OAR) 715-013-0020(1)

Proposal to Extend to Ecampus

Online course status (click on each course to see current Ecampus availability)

Ecampus Supporting Documents

Rename a Program

Explain how the academic program(s) or academic unit(s) current objectives, functions, and/or activities will change. Where applicable, address issues such as course offerings, program requirements, admission requirements, student learning outcomes and experiences, and how the advising structure and availability will be changed as a result of this proposal

Describe the extent to which affected faculty and staff support this change

If new resources will be required (e.g., for new faculty positions, graduate research/teaching assistants, facilities, equipment, etc.), explain where these resources will be coming from. Specify internal reallocation, Ecampus, college, OSU, federal, state, private, other funding sources or combination of funding sources

How will the proposed change to the academic program(s) or academic unit(s) support OSU's mission, vision, and goals?

Describe the potential positive and negative impacts of the proposed changes on the academic program(s) and/or academic units(s) involved. Identify other OSU academic programs or academic units which might be affected, and describe the potential positive and negative impact on their mission and activities

Describe how the proposal will affect the long-range strategic goals and plans for the academic program(s) or academic unit(s). Compare with OSU's current strategic plan and its three signature areas of distinction

What is the current relationship of the proposed academic program(s) or academic unit(s) with other higher education institutions in Oregon? Describe how this relationship might be altered based on the proposed change

Describe how the proposed change will affect other constituencies outside of OSU (e.g., federal state, local, private)

If the academic program is professionally accredited, identify the accrediting body and describe how the proposed change may affect accreditation

Reorganize a Program

Explain how the academic program(s) or academic unit(s) current objectives, functions, and/or activities will change. Where applicable, address issues such as course offerings, program requirements, admission requirements, student learning outcomes and experiences, and how the advising structure and availability will be changed as a result of this proposal

Describe the extent to which affected faculty and staff support this change

If new resources will be required (e.g., for new faculty positions, graduate research/teaching assistants, facilities, equipment, etc.), explain where these resources will be coming from. Specify internal reallocation, Ecampus, college, OSU, federal, state, private, other funding sources or combination of funding sources

How will the proposed change to the academic program(s) or academic unit(s) support OSU's mission, vision, and goals?

Describe the potential positive and negative impacts of the proposed changes on the academic program(s) and/or academic units(s) involved. Identify other OSU academic programs or academic units which might be affected, and describe the potential positive and negative impact on their mission and activities

Describe how the proposal will affect the long-range strategic goals and plans for the academic program(s) or academic unit(s). Compare with OSU's current strategic plan and its three signature areas of distinction

What is the current relationship of the proposed academic program(s) or academic unit(s) with other higher education institutions in Oregon? Describe how this relationship might be altered based on the proposed change

Describe how the proposed change will affect other constituencies outside of OSU (e.g., federal state, local, private)

If the academic program is professionally accredited, identify the accrediting body and describe how the proposed change may affect accreditation

HECC - Higher Education Coordinating Commission

Program Description

HECC Description

Oceanography is the scientific study of the ocean in its totality, from its large-scale structure and past history, to the inter-related biological, chemical, geological and physical processes that determine its present behavior and how it will evolve in the future under increasing pressures from humanity. Oceanography is a rigorous, fundamentally interdisciplinary science that is built on a foundation of basic sciences, and students employ core concepts in physics, chemistry, biology, and mathematics to study a range of ocean processes. The study of oceanography can take one from mountaintops to the bottom of the ocean, from the study of sea-ice melting to the ecology of the seafloor, from millions of years of Earth history archived in marine sediments to forecasting future heat transport by the Gulf Stream. Oceanographers increase our understanding of our planet and how it changes over time, identify and predict hazardous ocean processes, help sustainably manage living and nonliving resources, and mitigate environmental problems.

Experiential learning lies at the core of the oceanography program. Throughout their studies, oceanography students apply state-of-art field and laboratory techniques to study oceanic phenomenon in Oregon's waters, the nation, and around the world. Oceanography students also have the opportunity to contribute to the college's vibrant research hub, which includes world-class faculty and visiting scientists from across the globe. Students are mentored by, and often engage in research with, dedicated faculty with an exceptionally broad range of expertise.

The Oceanography degree is suitable for students interested in careers in applied ocean science, environmental sciences, science education, and in research. Graduates of the oceanography program are prepared to pursue post graduate studies in ocean science and allied fields.

Brief overview of the proposed program, including its disciplinary foundations and connections; program objectives; programmatic focus; degree, certificate, minor, and concentrations offered

Disciplinary Foundations: Oceanography focuses on understanding the ocean in its totality, from its large-scale structure and history, to the myriad biological, chemical, geological, and physical processes that shape its present state and future evolution. Covering over 70% of our planet's surface, the entire Earth is the oceanographer's laboratory. The study of oceanography can take one from mountaintops to the bottom of the ocean, from the study of sea-ice melting in the Arctic to the ecology of the equatorial Pacific or methane seeps on the continental slope, from millions of years of Earth history archived in marine sediments to forecasting future carbon or heat transport by the Gulf Stream. Oceanographers increase understanding of our planet and how it changes over time, identify and predict hazardous ocean processes (e.g., tsunami, sea level rise), help sustainably manage living and nonliving marine resources, and mitigate environmental problems such as ocean acidification and hypoxia. Because marine sediments are excellent archives of Earth's history, oceanographers also play a key role in characterizing past climate conditions and how they have changed and provide objective information to government officials and the public about future prospects.

Experiential learning lies at the core of an oceanographer's education in CEOAS and practical experiences are integrated throughout the curriculum. In field-intensive courses, often on research vessels, students build skills in teamwork, gain technical expertise, and synthesize classroom learning across the curriculum. Students in the oceanography program are mentored by a dedicated faculty with a broad range of expertise. The College is a vibrant research hub visited by scientists from around the world, complementing the world class research done by our own faculty. Undergraduate students often engage in research with faculty mentors. This program takes advantage of OSU's world-class faculty for undergraduate teaching and advising and provides an opportunity to attract strong, motivated students to a signature program that is unique within Oregon.

Program Objectives: To teach students to understand fundamental concepts and theories governing the ocean's behavior over a range of time and space scales; to develop in students a quantitative literacy in techniques specific to oceanography; to teach students applied practical skills in the discipline at a basic and advanced level through intensive experiential learning; to train students in the acquisition and dissemination of oceanographic concepts via written and oral means; and enable them to pursue postgraduate studies or careers in diverse marine-related fields.

Programmatic Focus: The new major will consist of 74 or 75 credits of course work. Early classes cover introductions to earth, ocean and climate fundamentals, as well as introductions to shipboard oceanography, biological, and physical oceanography. Oceanography core courses provide advanced training in oceanographic subfields such as biological, chemical, geological, and physical oceanography as well as topical examinations of coastal and polar oceanography and how humans and the ocean interact now and in the future. Students also choose electives from various disciplinary groupings (e.g., oceanography, geology, climate science, biology) to add breadth to their training and prepare them in their specific areas of interest.

Manner in which the program will be delivered, including program location (if offered outside of the main campus), course scheduling, and the use of technology (for both on-campus and off-campus delivery)

The proposed B.S. in Oceanography will be offered on-campus, at the OSU main campus in Corvallis. The "Supporting Math and Science" courses (mathematics, physics, chemistry, biology and statistics) are taught multiple quarters during the academic year. The preapproved electives include many options in the fields of oceanography, climate science, geology, and biology so students will be able to find electives that fit into their schedules. See the attached example four-year Course Schedule. We anticipate no difficulty for Oceanography students in scheduling general course requirements in a timely manner.

The proposed B.S. in Oceanography will largely follow existing modes of delivery, which emphasize active learning.

• Traditional classroom lectures, often enhanced through the use of digital audiovisual facilities including digital projection and audiovisual devices.

• Laboratories and recitations, where students will gain "hands-on" experience with techniques and problem solving, in both individual and group settings.

• Existing specialized teaching and research facilities and resources, including the following:

o Microscope Laboratory

o Elemental Analysis and HPLC Facilities

o Electron Microprobe Facility

o Ice Core & Quaternary Geochemistry Laboratory

o Ocean Observing Laboratory

- o OSU Argon Geochronology Laboratory
- o OSU Marine and Geology Repository (OSU-MGR)
- o Paleo- and Environmental Magnetism Laboratory
- o Stable Isotope Laboratory
- o W.M. Keck Collaboratory for Plasma Spectrometry

• The proposed curriculum will also continue and enhance the long-standing focus in oceanography-related curricula for experiential learning where students are exposed to oceanographic problems in a real-world context, whether in the computer lab or on the deck of one of our research vessels. This approach promotes active learning and provides a key context for material learned from other sources. It includes field trips to the Hatfield Marine Science Center and the nearby Yaquina Bay and coastal ocean as integral components of courses of all levels, as well as in designated field courses.

Adequacy and quality of faculty delivering the program

CEOAS currently offers a "Ocean Science" option under the Earth Sciences B.S. The proposed B.S. in Oceanography will be supported by the existing CEOAS faculty, so no new faculty will be required besides retirement replacements. Oceanography faculty represent an established graduate and undergraduate teaching unit and they have been highly successful in delivering oceanography courses since the 1960s, with consistently high teaching evaluations. Oceanography faculty members are noted for their exceptional research productivity, participation in outreach and engagement, and recognition at national and international levels. Faculty members and Teaching/Research Themes of oceanography can be found in all four of CEOAS' disciplines: Ocean Ecology and Biogeochemistry (OEB), Physics of the Ocean and Atmosphere (POA), Geology and Geophysics (G&G), and Geography, Environmental Sciences, and Marine Resource Management (GEM) on the college's web site (ceoas.oregonstate.edu).

A recent (2018) college-initiated external review stated that "CEOAS is a growing, productive academic and research unit with successful, nationally-recognized undergraduate and graduate programs and significant research funding expenditures averaged about \$45M annually over the last three years."

"Faculty have received a number of awards (NSF CAREER award, NSF NRT, NSF ADVANCE), as well as recognition by being fellows of various professional societies. In total there have been 25 such awards since 2014. This, as well as the overall research expenditures of CEOAS (about \$45M), is evidence of the high quality of the faculty and staff in OEAS and the strength of CEOAS overall."

"CEOAS undoubtedly provide a high-quality training environment for students and valuable opportunities for undergraduates who are interested in advanced STEM careers in earth, ocean and atmospheric science fields."

Additionally, two CEOAS faculty are lead authors for the (5th) or the upcoming (6th) Intergovernmental Panel on Climate Change (IPCC) report. Distinguished Professor Peter Clark was a coordinating lead author of the chapter Sea Level Change for the fifth report. For the sixth report, Distinguished Professor Alan Mix is a lead author on the chapter Ocean, Cryosphere and Sea Level Change.

Adequacy of faculty resources - full-time, part-time, adjunct

As of Fall 2020, CEOAS faculty consist of 115 teaching and research faculty https://ceoas.oregonstate.edu/people/browse/faculty/. Roughly 46 of these participate in oceanography instruction (sensu lato), including advising of undergraduate research projects and internships. Of these, there are 44 tenure-track faculty and 2 research faculty or fixed term instructors. See attached list of faculty resources. Faculty are shown with the oceanography courses they have taught in recent years. These examples are illustrative of typical faculty teaching loads and engagement in the undergraduate curriculum. Courtesy and adjunct faculty are listed at: https://ceoas.oregonstate.edu/people/browse/adjunct/. Although courtesy and adjunct faculty do not participate in undergraduate teaching (except for an occasional guest lecture), some of them serve as advisors for oceanography research projects or contribute to the program in other ways (by serving on the scholarship committee, for example).

Other staff

The B.S. in Oceanography will be supported by CEOAS staff, including the Office of Undergraduate Student Services (3 staff members), Communications Office (5 staff members), Undergraduate Advising staff (4 staff members), and Research Computing staff (4 members).

Adequacy of facilities, library, and other resources

The B.S. in Oceanography will be supported by CEOAS facilities staff (3 staff members). Existing classrooms and laboratories in CEOAS (Burt, Wilkinson & Strand Ag) and campus classrooms are currently adequate to meet the needs of course delivery. In addition, CEOAS operates two research vessels, the 55-foot-long RV Elakha and the 177-foot-long RV Oceanus. These ships, and the soon-to-be-delivered research vessel, the RV Taani, are used by students and faculty in research and education.

Relationship to Mission and Goals

Manner in which the proposed program supports the institution's mission, signature areas of focus, and strategic priorities

The proposed B.S. in Oceanography directly supports OSU's mission as a land-, sea-, space-, and sun-grant institution "to promote economic, social, cultural and environmental progress for the people of Oregon, the nation, and the world." Further, the ocean and the people who study it, intersect with all three of OSU's signature areas: the science of sustainable Earth ecosystems, health and wellness, and economic prosperity and social progress.

The B.S. in Oceanography focuses on the scientific study of the ocean in its totality, from its large-scale structure and past history, to the inter-related biological, chemical, geological and physical processes that determine its present behavior and how it will evolve in the future under increasing pressures from humanity. Oceanographers apply knowledge of biology, chemistry, physics and mathematics to solve marine-related problems, which reflects OSU's increased emphasis on interdisciplinary approaches to research and education and on critical thinking skills. In this manner, the next generation of Oceanography scholars will be developed providing impetus for seeking new knowledge and solutions to problems facing humanity. The proposed major will provide graduates with training in a rigorous, interdisciplinary program that covers all fundamentals of oceanography. A comprehensive program of this nature will provide students with the solid background required to contribute to any of the three Signature Areas identified in the OSU mission statement.

The B.S. in Oceanography directly addresses Goal 1 of OSU's mission to "provide outstanding academic programs that further strengthen performance and pre-eminence in the three Signature Areas of Distinction: Advancing the Science of Sustainable Earth Ecosystems, Improving Human Health and Wellness, and Promoting Economic Growth and Social Progress." Oceanography graduates will be prepared to address a wide range of issues associated with living and non-living marine resources, water column and seafloor processes, and natural hazards associated with our changing planet and the needs of the people living on it. Additionally, oceanography is by nature an experiential learning science, and the experiences that our students will encounter during their education – on land and at sea – will involve them in cutting edge research or relevant internships during their time at OSU.

Our highly skilled and nationally and internationally recognized faculty address Goal 2 of OSU's mission to "provide an excellent teaching and learning environment and achieve student access, persistence and success through graduation and beyond that matches the best land grant universities in the country." The program will provide a distinctive curriculum not available anywhere else in Oregon and incorporate innovative pedagogy, such as active

learning, throughout the curriculum. Including, as mentioned above, immersive experiential learning in courses, research projects, theses or internships. Oceanography faculty members are nationally and internationally recognized teachers and researchers, who apply these principles in both teaching and research.

Manner in which the proposed program contributes to institutional and statewide goals for student access and diversity, quality learning, research, knowledge creation and innovation, and economic and cultural support of Oregon and its communities

In support of Oregon State University's strategic goals, the Oceanography degree program will provide a transformative educational experience offering cutting edge coursework embedded in a broad foundation of science principles, using state of the art educational resources and pedagogic techniques. The overall objective of the program is to provide critical knowledge and skills for diverse students to access various career opportunities, including post graduate studies.

Oceanography engages in the general educational mission of the University through a suite of baccalaureate core courses (OC103, OC201, OC202 & OC333). These courses allow students from all backgrounds to engage in the study the ocean. In an effort to reduce costs for students, the majority of our required courses require no textbook or use online resources posted by the instructor. As an example, the textbook for OC 201, Oceanography (taken by roughly 500 students each year), is an opensource textbook available to students free of charge (http://www.reefimages.com/oceansci.php).

Additionally, CEOAS actively collaborates with Oregon community colleges to improve pathways for transfer students. A recent workshop (September 2018), organized by CEOAS advising staff, brought community college faculty and advisors together with CEOAS faculty, advisors, and program directors to facilitate exchange of information. Six community colleges from Oregon were represented. In September 2019, another event labeled "OSU Community College STEM DRIVE-IN" was hosted and many community colleges again participated in the event. CEOAS' transfer articulation guide can be found on our Future Students page here (https://ceoas.oregonstate.edu/future/transfer/guides/oregon/) and is continually updated.

CEOAS faculty and staff participate in numerous activities to strengthen and support diversity within the college. For example, the CEOAS Professional Learning Community is a group of students, faculty, and staff that explore topics related to social justice, diversity, and inclusivity. The group hosts the "Unpacking Diversity" discussion series throughout the year (https://unpackingdiversity.wixsite.com/ceoas), where invited scholars facilitate conversations centered on selected topics and readings. Additionally, CEOAS has hosted Social Justice Education Initiative sessions (most recently, SJEI TIER TWO - Creating Equitable Teaching and Learning Environments, in Spring 2019) for college faculty. One of the co-PI's for Oregon State ADVANCE (https://advance.oregonstate.edu/), which promotes the study and practice of equity, inclusion, and justice for historically underrepresented groups in the academy, is from CEOAS.

In the past, CEOAS and its pre-cursors (the College of Oceanic and Atmospheric Science & the Geosciences Department) have received funding to support efforts to increase diversity. From 2010-2015, COAS and GEO faculty co-administered "Increasing Diversity in Earth Science" (IDES), a 4-year (NSF-supported) program aimed at recruiting, retaining and graduating underrepresented minority students toward careers in Earth Science. COAS also led OSU participation in proposing and being awarded a 5-year Louis Stokes Alliance for Minority Participation award from NSF, beginning Fall 2009.

The department places an emphasis on quality learning, with a focus on experiential and active learning, both inside and outside of the classroom. The program's intensive field courses (OC 295 and OC 296) and data-analysis-centric courses (e.g., OC301, OC340, OC350, OC360) provide hands-on learning opportunities that develop transferrable skills. Many oceanography classes include laboratory or recitation sections to help students practice skills and gain a deeper understanding of ocean data. Experiential learning is at the core of the oceanography curriculum, in the form of ship-based field trips or laboratory work associated with classes, or during participation in research endeavors, internships, or theses outside of specific classes.

CEOAS has an Experiential Learning Coordinator who coordinates internships, undergraduate research and other experiential learning opportunities towards degree completion and career preparation for undergraduates in the College. She communicates new internship and research opportunities; identifies and coordinates with potential internship or research partners to foster the development of regular opportunities for students to complete internships with said partners; communicates with internship/research partners to align expectations and discuss educational opportunities afforded by prospective internships; and evaluates internships upon completion in liaison with partners, Program Directors, and the student.

Another position that we have in CEOAS is our Outreach Coordinator who serves as a nexus, connecting CEOAS students, faculty, and staff with opportunities for partnerships, community engagements, professional development, and resources. This includes coordination of requests for engagements with CEOAS scientists, curation of outreach webpages, communication of opportunities, and collaborations to develop strong community partnerships.

The college also participates in a number of organizations that support usage and study of best-practice instruction. In Fall 2018 CEOAS was selected, via a competitive application process, to participate in the National Association of Geoscience Teachers (NAGT) Traveling Workshops Program. This program offered a rare opportunity for college faculty to engage in a structured conversation about best practices in designing and implementing courses. Additionally, many oceanography faculty have attended other professional development workshops, such as those promoted by the Ocean Observing Initiative.

Lastly, faculty members in the oceanography program take advantage of the "On the Cutting Edge Professional Development Program" for earth and environmental science faculty (https://serc.carleton.edu) that provides a wealth of professional development workshops, webinars, and conference events, as well as best-practices teaching material, department resources, and the Geoscience Education Researcher Toolbox (https://nagt.org/nagt/geoedresearch/toolbox/index.html).

Manner in which the program meets regional or statewide needs and enhances the state's capacity to:

Improve educational attainment in the region and state:

The Oceanography degree program will contribute to the improved educational attainment in Oregon and the Pacific Northwest in several ways. The study of oceanography at OSU offers an opportunity to understand Oregon's fascinating coast, which extends from the crest of the Cascades to the deep sea 400 miles offshore, the myriad processes shaping the coast, and how humans can sustainably coexist with the ocean in the 21st century and beyond. Oceanography students become adept at placing skills and knowledge they learn in the classroom into a broader perspective and begin understanding how the ocean shapes nearly everything on our planet. Additionally, students often use real-world data in oceanography courses that help them develop quantitative skills, presentation skills, and a motivation for understanding how the ocean affects their lives.

Respond effectively to social, economic, and environmental challenges and opportunities:

The ocean plays a crucial role in Oregon's social, economic, and environmental systems. Graduates of the Oceanography program will be prepared to address marine-related challenges (e.g., ocean acidification, sea level rise) and pursue adaptation and mitigation solutions to these problems. The program will have positive economic and environmental impacts on the Pacific Northwest, especially the economically challenged coast. Additionally, baccalaureate core course offered to the broader OSU community (e.g., OC 103, OC 201, OC202, OC 333) will provide students with knowledge and skills relevant to their own fields, whether they be physics or art majors.

Address civic and cultural demands of citizenship

The Oceanography B.S. degree prepares students for civic and cultural responsibilities on several levels. The knowledge and training gained through the program will allow students to understand ocean-related issues on local, state, national and global levels. This understanding allows our students to assess complex issues and respond as an informed voter, donor and activist or, for students advancing to higher degrees, as a researcher or educator. In all cases, the Oceanography program will prepare students for the responsibilities of citizenship in a democracy.

Accreditation

Accrediting body or professional society that has established standards in the area in which the program lies, if applicable

Not applicable.

Ability of the program to meet professional accreditation standards. If the program does not or cannot meet those standards, the proposal should identify the area(s) in which it is deficient and indicate steps needed to qualify the program for accreditation and date by which it would be expected to be fully accredited

Not applicable.

If the proposed program is a graduate program in which the institution offers an undergraduate program, proposal should identify whether or not the undergraduate program is accredited and, if not, what would be required to qualify it for accreditation

Not applicable.

If accreditation is a goal, the proposal should identify the steps being taken to achieve accreditation. If the program is not seeking accreditation, the proposal should indicate why it is not

Not applicable.

Need

Anticipated fall term headcount, FTE enrollment, and expected degrees/certificates produced over each of the next five years

Year One: Fall Term Headcount: 75 FTE Enrollment: 75 Expected Degrees/Certificates 12 Year Two: Fall Term Headcount: 83 FTE Enrollment: 83 Expected Degrees/Certificates: 16 Year Three: Fall Term Headcount: 91 FTE Enrollment: 91 Expected Degrees/Certificates 20 Year Four: Fall Term Headcount: 99 FTE Enrollment: 99 Expected Degrees/Certificates 24 Year Five: Fall Term Headcount: 107 FTE Enrollment: 107 **Expected Degrees/Certificates** 28

Characteristics of students to be served (resident/nonresident/international; traditional/ nontraditional; full-time/part-time, etc.)

The B.S. in Oceanography will serve both full-time and part-time students. Current students in the B.S. in Earth Science with an Ocean Science option degree are likely similar to those who would enroll in the Oceanography major. The majority of our current Ocean Science students are full-time students, with a diverse mix of traditional and non-traditional aged students. Over 25% of our majors are first generation students or students of color; many come from out of state; and there is a growing number of international students in the major.

Evidence of market demand

The Washington DC-based Consortium for Ocean Leadership (COL) estimates that the socalled "Blue Economy" employs over 3 million Americans, contributes close to \$400 billion annually to the U.S. GDP, and is forecast to continue to strengthen and grow for the foreseeable future. Americans will continue to depend on the ocean for security, clean energy, food, shipping and tourism/recreation. Globally, coastal zones contribute over \$25 trillion annually to the world economy! Based on workforce surveys conducted by the COL, marine scientists are employed in three broad sectors: environmental monitoring, assessment and remediation; ocean technology; and education and outreach. The need for employment in these broad sectors is projected to spur demand for more rigorously trained marine scientists (see letter of support from Oregon Coastal Management Program).

According to the U.S. Bureau of Labor Statistics, employment of geoscientists and environmental scientists, of which oceanographers are a subset, is projected to grow 5-10 % from 2019 to 2029; a growth rate that is as fast as the average for all occupations in the U.S. According to recent American Geosciences Institute (AGI) workforce data, the majority (~88%) of graduates in geo- and environmental sciences are developing careers by applying knowledge as opposed to deriving new knowledge as done in academic and/or research positions. Based on the National Center for O*NET Development, occupations in the geosciences and environmental sciences have 2019 median annual salaries of \$92,040 and \$71,360, respectively. The O*NET report also indicates that most entry-level positions require a B.S. degree (~60%), whereas some positions available require a M.S. (25%) or Ph.D. (13%). Clearly, employment in the marine science sector can be lucrative and fulfilling.

If the program's location is shared with another similar Oregon public university program, the proposal should provide externally validated evidence of need (e.g., surveys, focus groups, documented requests, occupational/employment statistics and forecasts)

No shared location.

Estimate the prospects for success of program graduates (employment or graduate school) and consideration of licensure, if appropriate. What are the expected career paths for students in this program?

A central focus of the Oceanography curriculum is on transferrable skills, such as:

- Ability to apply biology, chemistry, physics, and mathematics principles to ocean problems
- Shipboard field work (instrumentation & sampling devices)
- Computer literacy and programming
- Data analysis and visualization
- Teamwork
- Critical thinking and scientific method
- Written reports and oral presentations

These skills will be useful for a range of careers involving the marine sciences:

- Ocean Technology Firms
- Non-profits
- Government Laboratories
- Marine-related positions in state and local governments
- Graduate school
- Military, e.g., US Navy & Coast Guard
- Earth Science Postsecondary Teacher
- Natural Science Management
- Academia

Transferable skills are incorporated in multiple classes within the oceanography curriculum,

so that students build proficiency throughout the program. Many of these skills will enhance students' employment competitiveness, depending on career paths. For example, most classes in the undergraduate curriculum involves some form of applied experience, including classes (e.g., OC 295, OC 296) that teach specific skills related to field oceanography, or some form of data analysis skills (e.g., OC 301, OC 340, OC 350), which allow students to collect and interpret data and present those interpretations in a public forum. Indeed, written and oral communication skills are crucial for the positions listed above. Oceanographers often present and explain their findings to audiences of varying backgrounds and write technical reports, and these communication skills are practiced across the oceanography curriculum.

Career paths will depend on which electives a student chooses to take, and their focus within the broad realm of oceanography (e.g., biological, chemical, physical, etc.). Faculty will work with academic advisors to provide information about suggested electives based on students' career goals, such as graduate school in Earth Sciences, policy, or outreach. Oceanography program requirements leave students with space in their program of study to work toward additional qualifications such as the GIS Certificate and various minors. Depending on their career goals, additional education may be required; however, students should be well-prepared for these programs, and a number of recent Ocean Science option graduates have gone on to graduate school in prestigious programs in the USA and abroad. The CEOAS Academic Mentoring Program (CEOAS AMP) provides the opportunity for undergraduate and graduate students to connect. Through conversations with their graduate mentor, undergraduate mentees will have the opportunity to learn about graduate school and to explore various academic and career pathways.

Outcomes and Quality Assessment

Expected learning outcomes of the program

All students completing the Oceanography B.S. will be expected to:

1. Explain the principles and concepts of oceanography including the interrelationships between biological, chemical, geological, and physical oceanography and how people are influencing the ocean.

2. Acquire, quantitatively analyze, and interpret diverse data types (e.g., instrumental, proxy and model-derived) from core areas of oceanography.

3. Comprehend and critically analyze oceanographic ideas presented in the scientific literature.

4. Communicate diverse and complex ocean-related concepts, both orally and in writing, to a variety of audiences and stakeholders, including non-scientists and the general public.

Methods by which the learning outcomes will be assessed and used to improve curriculum and instruction

Details of the methods by which the learning outcomes will be assessed and used to improve the curriculum and instruction are shown below. We also draw your attention to the attached Curriculum Map that indicates which the core courses relate to individual learning outcomes.

Per-question grades will be used to guide improvement of the courses that cover that topic. The Oceanography Program Director, along with the Associate Dean of Undergraduate Programs (ADUP) will review all of the data, which will be presented and discussed at our Undergraduate Program Committee meetings (program directors, ADUP & supporting staff) and at quarterly meetings of the Oceanography faculty. Faculty will review answers relevant for their particular courses.

Per-question scores for the exam and term papers rubric, along with cohort, will be saved in a spreadsheet. Specific wording for each question/assignment will also be saved each year, for reference in case wording changes in future years (to better assess apparent trends in student learning). We expect to archive the data electronically (e.g., Google document) indefinitely. Responsibility for this archiving will reside in the office of the CEOAS ADUP.

Nature and level of research and/or scholarly work expected of program faculty; indicators of success in those areas

Faculty in the College of Earth, Ocean, and Atmospheric Sciences are expected to engage in research that contributes to the development of their discipline and to their own individual scientific competence. As a land-grant and Sea Grant university, faculty are also expected to communicate knowledge to diverse audiences on campus and within the broader community. Depending on faculty rank and position, indicators of success in this work are the attainment of grant funding, publication in peer-review journals, effective and exemplary teaching based on their research as reported in annual Student Evaluations of Teaching, and service to their institution, academic colleagues, professional and research associates, and community partners. Tenure track faculty are subject to a rigorous promotion and tenure system as the they move from Assistant Professor to Associate Professor and finally Professor ranks in which research performance is crucial criteria, evaluated by their peers in the USA and internationally. Promotion tracks for non-tenure research faculty also have clear and rigorous metrics for research performance. A recent ranking of oceanography programs placed OSU's program number three in the world!

Program Integration and Collaboration

Closely related programs in this or other Oregon colleges and universities

No institutions of higher learning in Oregon offer undergraduate degrees in Oceanography (or Ocean Science, Marine Science).

Although other public (Oregon Institute of Technology, Portland State University, Southern

Oregon University, University of Oregon, and Western Oregon University) and private institutions (Lewis & Clark College, Linfield College, Multnomah University, Pacific University, Reed College, University of Portland, and Willamette University) offer undergraduate degrees in Earth Science (or Geology), Environmental Science/Studies and Marine Biology, none of these focus on Oceanography, which is the study of the ocean in its totality.

Ways in which the program complements other similar programs in other Oregon institutions and other related programs at this institution. Proposal should identify the potential for collaboration

Oregon State University has a range of ocean related programs that the proposed Oceanography B.S. degree complements but does not duplicate. On the science side, established programs in Fisheries & Wildlife (College of Agriculture) and Marine Biology (College of Science) focus mainly on the biology and ecology of organisms living in the ocean, as well as their sustainable management. Neither of these programs focuses on the ocean as a whole or the inter-related biological, chemical, geological, and physical processes that govern its behavior over a range of time and space scales. On the humanities and social science side, the newly created Marine Studies program (College of Liberal Arts) focuses on the social, political and cultural issues of the coasts and ocean; it is not a science focused degree program. Together these four degree programs position OSU at the forefront of marine-related instruction in the USA.

If applicable, proposal should state why this program may not be collaborating with existing similar programs

Not applicable - there are no other similar programs in Oregon.

Potential impacts on other programs

As the only Oceanography program in the state, and one of a handful on the US West Coast, it is anticipated that the program will attract additional students to OSU. This will increase enrollment in classes outside the college, particularly upper-level ocean-related electives, which could be particularly beneficial for low-enrollment courses.

Program Learning Outcomes (click the green plus button to add learning outcome)

Learning Outcome

1. Explain the principles and concepts of oceanography including the interrelationships between biological, chemical, geological, and physical oceanography and how people are influencing the ocean.

Expected reporting year (all outcomes must be assessed within a 5 year period)

2022

List courses where this outcome will be taught

OC201, OC202, OC298, OC301, OC332, OC333, OC 340, OC350, OC360, OC430, OC444, OC498

Assessment measures used to assess the outcome. Label each measure as either direct (D) or indirect (I)

An ungraded in-class exam, consisting of 10 open-ended questions, with 2 each from the categories biological, chemical, geological, physical oceanography and human-ocean interactions, will be given in week 1 of OC498, Grand Challenges in Oceanography, (the "capstone" course) to evaluate students' understanding of these five facets of oceanography. (D)

Benchmarks of success used to determine if the outcome has been satisfactorily met by students

80% of students will receive a passing grade of 70% or higher on 1 of the 2 questions in each subsection of the quiz and an overall grade of at least 70%.

Learning Outcome

2. Acquire, quantitatively analyze, and interpret diverse data types (e.g., instrumental, proxy and model-derived) from core areas of oceanography.

Expected reporting year (all outcomes must be assessed within a 5 year period)

2023

List courses where this outcome will be taught

OC201, OC202, OC295, OC296, OC298, OC301, OC332, OC 340, OC350, OC360, OC430, OC444

Assessment measures used to assess the outcome. Label each measure as either direct (D) or indirect (I)

Students will download, analyze and interpret oceanographic "section" data (e.g., T, S, dissolved oxygen) using the program Ocean Data View in a lab during the final third (weeks 6-8) of OC350, Chemical Oceanography. Students will be graded using the "Quantitative

Literacy" VALUE rubrics published by the Association of American Colleges and Universities. (D)

Benchmarks of success used to determine if the outcome has been satisfactorily met by students

80% of students will receive at least 2 points out of a maximum of 4 in each category, with a total average of 2.8/4 (70%)

Learning Outcome

3. Comprehend and critically analyze oceanographic ideas presented in the scientific literature.

Expected reporting year (all outcomes must be assessed within a 5 year period)

2024

List courses where this outcome will be taught

OC201, OC202, OC298, OC301, OC332, OC333, OC 340, OC350, OC360, OC444, OC498

Assessment measures used to assess the outcome. Label each measure as either direct (D) or indirect (I)

As part of OC498, Grand Challenges in Oceanography, students will be tasked with preparing a written synthesis of 5-10 peer-reviewed papers on a topic of their choosing. Students will be graded using the "Inquiry and Analysis" VALUE rubric published by the Association of American Colleges and Universities. (D)

Benchmarks of success used to determine if the outcome has been satisfactorily met by students

80% of students will receive at least 80% on this assignment

Learning Outcome

4. Communicate diverse and complex ocean-related concepts, both orally and in writing, to a variety of audiences and stakeholders, including non-scientists and the general public.

Expected reporting year (all outcomes must be assessed within a 5 year period)

2025

List courses where this outcome will be taught

OC202, OC296, OC298, OC333, OC340, OC360, OC444, OC498

Assessment measures used to assess the outcome. Label each measure as either direct (D) or indirect (I)

As part of OC444, Polar Oceanography, students will be required to prepare a synthetic term paper on a polar oceanographic topic of their choosing and present a synopsis of their findings verbally to the class. OC444 fulfills the Writing Intensive Course (WIC) Baccalaureate Core requirement. It does this by requiring a term paper (at least 2,000 words long) as well as shorter abstracts and lab reports. Students will be graded using the "Written Communication" VALUE rubrics published by the Association of American Colleges and Universities.

Benchmarks of success used to determine if the outcome has been satisfactorily met by students

80% of students will receive at least 2 points out of a maximum of 4 in each category, with a total average of 2.8/4 (70%).

Graduate Learning Outcomes (GLOs) for Graduate Students

Will this program fulfill more than one learning outcome?

Conduct research or produce some other form of creative work

List the measures or instruments used to assess each outcome. How do students demonstrate their attainment of the learning outcome? How is their learning evaluated? At least one of these must be a direct measure. In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year

Has this assessment method changed since the last reporting cycle?

Explain any changes

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students? In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year

Describe any changes to the benchmark or milestone since the last reporting cycle

Describe the data collection process (e.g., Who is involved? How is the data collected?)

What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success

Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year's assessment of this outcome. Include timelines

Describe any program or degree-level changes that are an outgrowth of the current year's assessment of this outcome. Include timeline

If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, indicate the year you will revisit this outcome

Demonstrate mastery of subject material

List the measures or instruments used to assess each outcome. How do students demonstrate their attainment of the learning outcome? How is their learning evaluated? At least one of these must be a direct measure. In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year

Has this assessment method changed since the last reporting cycle?

Explain any changes

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students? In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year

Describe any changes to the benchmark or milestone since the last reporting cycle

Describe the data collection process (e.g., Who is involved? How is the data collected?)

What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success

Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year's assessment of this outcome. Include timelines

Describe any program or degree-level changes that are an outgrowth of the current year's assessment of this outcome. Include timeline

If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, indicate the year you will revisit this outcome

Conduct scholarly or professional activities in an ethical manner

List the measures or instruments used to assess each outcome. How do students demonstrate their attainment of the learning outcome? How is their learning evaluated? At least one of these must be a direct measure. In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year

Has this assessment method changed since the last reporting cycle?

Explain any changes

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students? In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year

Describe any changes to the benchmark or milestone since the last reporting cycle

Describe the data collection process (e.g., Who is involved? How is the data collected?)

What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success

Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year's assessment of this outcome. Include timelines

Describe any program or degree-level changes that are an outgrowth of the current year's assessment of this outcome. Include timeline

If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, indicate the year you will revisit this outcome

Process

Describe the process the program used to reflect on the outcome data

Were there any challenges or concerns?

How are the results of your assessment effort related to strategic planning and overall program review?

Are there specific data archiving notes for the outcome(s) you are reporting on in this report?

Plans

Describe the unit's (or sub-units) assessment plans for the upcoming year

Additional Graduate Level Student Learning Outcomes (optional)

Graduate Learning Outcomes

Graduate Learning Outcomes (GLOs) for Doctoral Students

Will this program fulfill more than one learning outcome?

Produce and defend an original significant contribution to knowledge

List the measures or instruments used to assess each outcome. How do students demonstrate their attainment of the learning outcome? How is their learning evaluated? At least one of these must be a direct measure. In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year

Has this assessment method changed since the last reporting cycle?

Explain any changes

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students? In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year

Describe the data collection process (e.g., Who is involved? How is the data collected?)

What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success

Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year's assessment of this outcome. Include timelines

Describe any program or degree-level changes that are an outgrowth of the current year's assessment of this outcome. Include timeline

If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, indicate the year you will revisit this outcome

Describe the process the program used to reflect on the outcome data

Were there any challenges or concerns?

How are the results of your assessment effort related to strategic planning and overall program review?

Are there specific data archiving notes for the outcome(s) you are reporting on in this report?

Describe the unit's (or sub-units) assessment plans for the upcoming year

Demonstrate mastery of subject material

List the measures or instruments used to assess each outcome. How do students demonstrate their attainment of the learning outcome? How is their learning evaluated? At least one of these must be a direct measure. In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year

Has this assessment method changed since the last reporting cycle?

Explain any changes

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students? In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year

Describe the data collection process (e.g., Who is involved? How is the data collected?)

What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success

Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year's assessment of this outcome. Include timelines

Describe any program or degree-level changes that are an outgrowth of the current year's assessment of this outcome. Include timeline

If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, indicate the year you will revisit this outcome

Describe the process the program used to reflect on the outcome data

Were there any challenges or concerns?

How are the results of your assessment effort related to strategic planning and overall program review?

Are there specific data archiving notes for the outcome(s) you are reporting on in this report?

Describe the unit's (or sub-units) assessment plans for the upcoming year

Conduct scholarly or professional activities in an ethical manner

List the measures or instruments used to assess each outcome. How do students demonstrate their attainment of the learning outcome? How is their learning evaluated? At least one of these must be a direct measure. In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year

Has this assessment method changed since the last reporting cycle?

Explain any changes

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students? In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year

Describe the data collection process (e.g., Who is involved? How is the data collected?)

What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success

Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year's assessment of this outcome. Include timelines

Describe any program or degree-level changes that are an outgrowth of the current year's assessment of this outcome. Include timeline

If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, indicate the year you will revisit this outcome

Describe the process the program used to reflect on the outcome data

Were there any challenges or concerns?

How are the results of your assessment effort related to strategic planning and overall program review?

Are there specific data archiving notes for the outcome(s) you are reporting on in this report?

Describe the unit's (or sub-units) assessment plans for the upcoming year

Additional Doctoral Level Student Learning Outcomes (optional)

Information for the Catalog

How many total credits are required for completion of this program? 180

Catalog Description (this will display on the Overview tab in the Catalog)

Requirements (this will display on the Requirements tab in the Catalog and be coded into MyDegrees)

	Course List	
Code	Title	Credits
Supporting Math	n & Science	
Math		
<u>MTH 251</u>	*DIFFERENTIAL CALCULUS	4
<u>MTH 252</u>	INTEGRAL CALCULUS	4
Statistics		
<u>ST 351</u>	INTRODUCTION TO STATISTICAL METHODS	4
Select one addit	ional quantitative skills course:	4
<u>ATS 302</u>	MATHEMATICAL APPLICATIONS IN THE EARTH SCIENCES	
<u>GEOG 360</u>	GISCIENCE I: GEOGRAPHIC INFORMATION SYSTEMS AND THEORY	
<u>ST 352</u>	INTRODUCTION TO STATISTICAL METHODS	

Course List

Code	Title	Credits
Biology		
<u>BI 221</u>	*PRINCIPLES OF BIOLOGY: CELLS	4
<u>BI 222</u>	*PRINCIPLES OF BIOLOGY: ORGANISMS	4
or <u>BI 223</u>	*PRINCIPLES OF BIOLOGY: POPULATIONS	
Chemistry		
<u>CH 121</u>	GENERAL CHEMISTRY	5
or <u>CH 231</u>	GENERAL CHEMISTRY	
& <u>CH 261</u>	and *LABORATORY FOR CHEMISTRY 231	
<u>CH 122</u>	*GENERAL CHEMISTRY	5
or <u>CH 232</u>	GENERAL CHEMISTRY	
& <u>CH 262</u>	and *LABORATORY FOR CHEMISTRY 232	
Physics		
<u>PH 211</u>	*GENERAL PHYSICS WITH CALCULUS	4-5
or <u>PH 201</u>	*GENERAL PHYSICS	
<u>PH 212</u>	*GENERAL PHYSICS WITH CALCULUS	4-5
or <u>PH 202</u>	*GENERAL PHYSICS	
Biology, Chemistr	y or Physics	
Select one addition	onal BI, CH or PH course in sequence	4-5
Earth Systems Cor	re	
<u>ATS 201</u>	*CLIMATE SCIENCE	4
<u>GEO 201</u>	*PHYSICAL GEOLOGY	4
<u>OC 201</u>	*OCEANOGRAPHY	4
Oceanography Co	re	
<u>OC 202</u>	*INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY	4
<u>OC 295</u>	INTRODUCTION TO FIELD OCEANOGRAPHY - LAND	1
<u>OC 296</u>	INTRODUCTION TO FIELD OCEANOGRAPHY - SEA	2
<u>OC 298</u>	INTRODUCTION TO PHYSICAL OCEANOGRAPHY	4
<u>OC 301</u>	OCEANOGRAPHIC DATA ANALYSIS	4
<u>OC 332</u>	COASTAL OCEANOGRAPHY	3
<u>OC 333</u>	*OCEANS, COASTS, AND PEOPLE	3
<u>OC 340</u>	BIOLOGICAL OCEANOGRAPHY	4
<u>OC 350</u>	CHEMICAL OCEANOGRAPHY	4
<u>OC 360</u>	GEOLOGICAL OCEANOGRAPHY	4
<u>OC 430</u>	PRINCIPLES OF PHYSICAL OCEANOGRAPHY	4
or <u>OC 433</u>	COASTAL AND ESTUARINE OCEANOGRAPHY	
<u>OC 444</u>	^POLAR OCEANOGRAPHY	3
<u>OC 498</u>	GRAND CHALLENGES IN OCEANOGRAPHY	3

Experiential Learning

Course List				
Code	Title	Credits		
<u>OC 401</u>	RESEARCH PROJECTS	3		
or <u>OC 403</u>	THESIS			
or <u>OC 410</u>	INTERNSHIP			
Oceanography El	ectives			
Select 18 credits	from the following pre-approved upper-division courses: 1	18		
Oceanography				
<u>OC 430</u>	PRINCIPLES OF PHYSICAL OCEANOGRAPHY			
<u>OC 433</u>	COASTAL AND ESTUARINE OCEANOGRAPHY			
<u>OC 434/FW</u> <u>434</u>	ESTUARINE ECOLOGY			
<u>OC 436</u>	ACOUSTICAL OCEANOGRAPHY			
<u>OC 449</u>	ECOLOGICAL THEORIES IN BIOLOGICAL AND FISHERIES OCEANOGRAPHY DATA			
<u>OC 453</u>	CHEMISTRY OF NATURAL WATERS			
<u>OC 465</u>	CENOZOIC PALEOCEANOGRAPHY			
<u>OC 495</u>	ADVANCED FIELD OCEANOGRAPHY 1			
<u>OC 496</u>	ADVANCED FIELD OCEANOGRAPHY 2			
Geology				
<u>GEO 370</u>	STRATIGRAPHY AND SEDIMENTOLOGY			
<u>GEO 433</u>	COASTAL GEOMORPHOLOGY			
<u>GEO 463</u>	^GEOPHYSICS AND TECTONICS			
<u>GEO 481</u>	GLACIAL GEOLOGY			
<u>GEO 484</u>	INTRODUCTION TO BIOGEOCHEMISTRY			
<u>GEO 486</u>	QUATERNARY PALEOCLIMATOLOGY			
Climate Science				
<u>ATS 310</u>	METEOROLOGY			
<u>ATS 341</u>	*SNOW, SMOKE, AND STORMS: CLIMATE CHANGE IMPACTS IN THE PNW			
<u>ATS 420</u>	CLIMATE PHYSICS			
<u>ATS 421</u>	CLIMATE MODELING			
<u>GEOG 323</u>	^CLIMATOLOGY			
Biology				
<u>BI 351</u>	MARINE ECOLOGY			
<u>BI 353</u>	PACIFIC NORTHWEST COASTAL ECOSYSTEMS			
<u>BI 370</u>	ECOLOGY			
<u>FW 324</u>	*FOOD FROM THE SEA			
<u>FW 464</u>	MARINE CONSERVATION BIOLOGY			
<u>MB 314</u>	AQUATIC MICROBIOLOGY			

Course Li	st
-----------	----

Code	Title	Credits
Mathematics		
Up to two additional courses beyond MTH 252	, such as <u>MTH 254</u> , <u>MTH 256</u> ,	
<u>MTH 341</u>		
Additional Requirements		
Remaining Bacc Core and General Electives		58
Total Credits		180
Sample Curriculum Plan (this will display on the	Sample Plan tab in the Catalog and b	e added
to a MyDegrees template)		

	Plan of Study Grid	
	First Year	
	Fall	Credits
<u>CH 231</u> & <u>CH 261</u>	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 231	5
<u>MTH 251</u>	*DIFFERENTIAL CALCULUS	4
<u>OC 201</u>	*OCEANOGRAPHY	4
<u>WR 121</u>	*ENGLISH COMPOSITION	4
	Credits	17
	Winter	
<u>CH 232</u> & <u>CH 262</u>	GENERAL CHEMISTRY and *LABORATORY FOR CHEMISTRY 232	5
<u>MTH 252</u>	INTEGRAL CALCULUS	4
<u>OC 202</u>	*INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY	4
<u>OC 295</u>	INTRODUCTION TO FIELD OCEANOGRAPHY - LAND	1
	Credits	14
	Spring	
<u>COMM 111</u> or <u>COMM 114</u>	*PUBLIC SPEAKING or *ARGUMENT AND CRITICAL DISCOURSE	3
<u>HHS 231</u>	*LIFETIME FITNESS FOR HEALTH	2
<u>OC 296</u>	INTRODUCTION TO FIELD OCEANOGRAPHY - SEA	2
<u>OC 298</u>	INTRODUCTION TO PHYSICAL OCEANOGRAPHY	4
Bacc Core: Differ	ence, Power & Discrimination	4
	Credits	15
	Second Year	
	Fall	
<u>ATS 201</u>	*CLIMATE SCIENCE	4
<u>BI 221</u>	*PRINCIPLES OF BIOLOGY: CELLS	4
<u>OC 333</u>	*OCEANS, COASTS, AND PEOPLE	3

Bacc Core: PAC	2	1
Bacc Core: Cult	ural Diversity	3
	Credits	15
	Winter	
<u>BI 222</u>	*PRINCIPLES OF BIOLOGY: ORGANISMS	4
<u>OC 332</u>	COASTAL OCEANOGRAPHY	3
<u>ST 351</u>	INTRODUCTION TO STATISTICAL METHODS	4
Bacc Core: Writ	ting II	3
	Credits	14
	Spring	
<u>OC 301</u>	OCEANOGRAPHIC DATA ANALYSIS	4
<u>OC 401</u>	RESEARCH PROJECTS	
or <u>OC 403</u>	or THESIS	3
or <u>OC 410</u>	or INTERNSHIP	
Additional BI, P	PH, or CH Course	4
General Electiv	re la	4
	Credits	15
	Third Year	
	Fall	
<u>GEO 201</u>	*PHYSICAL GEOLOGY	4
<u>PH 201</u>	*GENERAL PHYSICS	4-5
or <u>PH 211</u>	or *GENERAL PHYSICS WITH CALCULUS	+ 5
Quantitative Sk	kills	3
Bacc Core: Soci	al Processes & Institutions	4
	Credits	15
	Winter	
<u>OC 350</u>	CHEMICAL OCEANOGRAPHY	4
<u>PH 202</u>	*GENERAL PHYSICS	4-5
or <u>PH 212</u>	or *GENERAL PHYSICS WITH CALCULUS	+ 5
Oceanography	Elective	3
Bacc Core: Wes	stern Culture	4
	Credits	15
	Spring	
<u>OC 340</u>	BIOLOGICAL OCEANOGRAPHY	4
<u>OC 360</u>	GEOLOGICAL OCEANOGRAPHY	4
Oceanography	Elective	4
Bacc Core: Lite	rature & the Arts	3
	Credits	15
	Fourth Year	
	Fall	

<u>OC 430</u>	PRINCIPLES OF PHYSICAL OCEANOGRAPHY	Л
or <u>OC 433</u>	or COASTAL AND ESTUARINE OCEANOGRAPHY	4
Oceanography El	ective	4
General Elective		4
General Elective		3
	Credits	15
	Winter	
<u>OC 444</u>	^POLAR OCEANOGRAPHY	3
Oceanography El	ective	4
Bacc Core: Science	ce, Technology & Society	4
General Elective		4
	Credits	15
	Spring	
<u>OC 498</u>	GRAND CHALLENGES IN OCEANOGRAPHY	3
Oceanography El	ective	3
General Elective		3
General Elective		3
General Elective		3
	Credits	15
	Total Credits	180
Lattors of S	upport	

Letters of Support

External Letters of Support OR_Coastal_Management_Program_LOS.pdf UOregon_LOS.pdf

Letters of Support (optional)

External Letters of Support

Accessibility Form

Accessibility Guidelines I have reviewed the listed documents

Faculty Guidelines I have reviewed the listed documents

Information Technology Guidelines I have reviewed the listed documents By submitting this form, we affirm that we have reviewed the listed documents and will apply a good faith effort to ensure accessibility in curricular design, delivery, and supporting information.

External Review of New Graduate Program

Review Documents

Library Evaluation

Will this program require the creation of new courses?

Yes

Provide peer comparator review

University of Washington Humboldt State University University of California, Santa Cruz Stony Brook University

Provide projected faculty and student FTE for your program

Faculty: 4.51, 4.51, 4.51. Students: 75, 83, 91.

Provide detail about any special research areas of interest

None.

Administrative Template (Library Use Only)

Summary of Recommendations

The monograph collection appears to be marginally adequate to support the proposed program. There are approximately 50 new titles published each year in the general subject area of oceanography. To better support access to current monograph content, additional funds are required to ensure titles can be purchased either in print or electronic formats. The journal collection is currently adequate to support the proposed program. There is only one high impact journal that OSULP lacks immediate access. Adding Journal of Operational Oceanography would complete access to high-ranking journals in the subject area of Oceanography.

Print and Electronic Monographs

Library evaluations of proposed programs have traditionally included the analysis of OSULP's print monograph collection. In this instance, it was decided to look forward at the publishing trends in the subject area of Oceanography. As the program is focusing on preparing students for working in this industry, access to new trends and research via published monographs in this area will be more impactful to meeting that goal.

Approximately 50 new books in the subject of Oceanography are published each year. It is expected that to keep pace with emerging trends in the industries that at least 25 new monographs should be acquired each year. Print books in this area average \$100 and e-books average \$250.

The growing availability of e-books makes it possible to expedite access to more information from various locations for multiple users at the same time. Students are able to access the books from their computer or mobile device at any time. Where available and financially reasonable, the library acquires e-books over print books. At any point a print book may be requested in addition to an e-book to support different learning modalities.

OSU is well served by the OSULP investment in the Orbis/Cascades Alliance, whose combined collection is substantial. Students and faculty can order from the collections of all the libraries in the Orbis Cascade Alliance through the library catalog. University of Oregon, Portland State University, University of Washington and Washington State University are some of the larger research libraries represented in the library catalog. Books requested through Summit are delivered to OSULP within three to five working days.

Media

N/A

Serials/Journals

The OSULP maintains an adequate collection of journals appropriate for this proposed program. There is concern that with regular price increases to our licenses and a flat budget that access may be eroded over time. The OSULP has already sacrificed timely access to some titles in favor of an embargo period to cut costs (these journals are only available after a 12-18 month delay). A list of key journals for this program was developed using the "Oceanography" subject category in the Journal Citation Report (JCR). This produced a list of 67 journals (see Appendix A). The list includes those titles that we have current access to, those with embargoes and those not owned by the OSULP.

OSU Libraries has current subscriptions to 60 of these titles (90 %), and delayed access to an additional 5 titles. Of the high-impact journals (impact factor >= 2), the library has access to all but 1 of the 32 journals. There is 1 highly relevant journal that is recommended for a new subscription.

In addition to the recommended new subscription, the library will monitor usage of interlibrary loan (ILL) for titles under embargo and those with no access to determine whether usage justifies the acquisition of additional journals.

Table 2. Recommended New Journals

Journal of Operational Oceanography Online subscription \$796

Indexes and Databases

The core indexes to the relevant information for this program are listed in Table 3. The OSULP maintains access to all as these are core to many of OSU's primary research areas.

Library Services

Library faculty help students develop information literacy skills--the ability to locate, evaluate, and use information effectively--and help students understand their lifelong roles and responsibilities as both consumers and creators in the information ecosystem. More information on library instruction is available at https://library.oregonstate.edu/instruction-services.

The Library Liaison for the College of Earth, Ocean and Atmospheric Sciences is Clara Llebot Lorente. Liaisons are library faculty members that monitor the strategic directions and priorities of college and programs, and are a conduit to the expertise and services of the OSU Libraries. Liaisons are a point of contact for CEOAS in the library, and can answer questions from students, faculty and staff. In addition, Mary Markland is the director of the Guin Library at the Hatfield Marine Science Center and is a resource for students and faculty with HMSC courses or fieldwork.

OSULP offers a series of services for students, faculty and staff engaged in research, including data services, a digital repository, copyright and metadata consultations, and guidance for open access publishing. See a list of resources at

https://library.oregonstate.edu/researcher-support. The Library also hosts free workshops throughout the term on various topics such as citation management tools, data collection and analysis tools, and research and writing. More information in

https://guides.library.oregonstate.edu/c.php?g=285930&p=7869637

The OSULP Collection Council maintains the libraries' collections. Providing access to items not owned by OSULP is the domain of the Interlibrary Loan and Summit staff both at OSULP and at lending libraries. Print articles located in the OSU Libraries collections may be requested via the Scan and Deliver service, which provides PDFs of the requested articles. Additional services for students include the physical attributes of the libraries including excellent computer facilities, study areas for individual and group work, and practice rooms for students. The Guin Library at the Hatfield Marine Science Center is a part of OSU Library and Press and provides equivalent services and space.

Library Evaluation

Faculty CVs

I will provide individual CVs if requested by Faculty Senate Curriculum Council Acknowledge

Enter faculty below: (click the green plus button to add faculty members)

Faculty Name	Academic Home	Highest Degree	Position Title	Area of Expertise/Interest	Role Within Program
Barth, Jack	CEOAS-POA	PhD	Professor, Exec. Director Marine Studies	coastal physical oceanography, marine ecosystems	OC103, OC332, OC433
Bernard, Kim	CEOAS-OEB	PhD	Associate Professor	polar zooplankton ecology	OC202, OC444
Boiteau, Rene	CEOAS-OEB	PhD	Assistant Professor	organic biogeochemistry, trace metal cycling	OC350, OC456
Brook, Ed	CEOAS-G&G	PhD	Distinguished Professor	paleoclimatology, ice core trace gas records	GEO electives
Buizert, Christo	CEOAS-G&G	PhD	Assistant Professor	paleoclimatology, abrupt climate change, firn processes	GEO electives
Ciannelli, Lorenzo	CEOAS-OEB	PhD	Professor	fisheries oceanography, spatial ecology	OC340, OC449
Clark, Peter	CEOAS-G&G	PhD	Distinguished Professor	dynamics of glaciers & ice sheets, sea level change	GEO electives
Colwell, Rick	CEOAS-OEB	PhD	Professor	microbial ecology, geomicrobiology	OC103, GEO electives
Crump, Byron	CEOAS-OEB	PhD	Professor	aquatic microbial ecology	OC340, OC434
Dever, Ed	CEOAS-POA	PhD	Professor	coastal physical oceanography, arisea interaction	OC298, OC430, OC433
Fehrenbacher, Jennifer	CEOAS-OEB	PhD	Assistant Professor	trace element & stable isotope geochemistry	OC201, OC464, GEO484
Fewings, Melanie	CEOAS-POA	PhD	Associate Professor	coastal physical oceanography & meteorology	OC430

Faculty Name	Academic Home	Highest Degree	Position Title	Area of Expertise/Interest	Role Within Program
Fram, Jonathan	CEOAS-POA	PhD	Asoc. Prof. (Senior Research)	physical oceanography, ocean observatories	OC332
Goldfinger, Chris	CEOAS-G&G	PhD	Professor	marine geology & geophysics, paleoseismology	GEO electives
Goni, Miguel	CEOAS-OEB	PhD	Professor	chemical oceanography, organic geochemistry chemical	OC103, OC295/6, OC350
Hales, Burke	CEOAS-OEB	PhD	Professor	oceanography, carbon cycles, ocean acidification	OC350, GEO484
Harte, Michael	CEOAS-GEM	PhD	Professor, Assoc. Dean of Undergrad Programs	marine geography, natural resource management	OC333
Hutchings, Jenny	CEOAS-POA	PhD	Associate Professor	sea ice dynamics and mechanics	ATS electives
Juranek, Laurie	CEOAS-OEB	PhD	Associate Professor	dissolved gases, isotope biogeochemistry	OC444
Kavanaugh, Maria	CEOAS-OEB	PhD	Assistant Professor	seascape ecology, remote sensing, global change marine geology	OC201, OC202, OC340
Keller, Randy	CEOAS-G&G	PhD	Instructor	igneous	OC103e
Lerczak, Jim	CEOAS-POA	PhD	Professor	coastal & estuarine physical oceanography	OC301, OC433, OC430
Letelier, Ricardo	CEOAS-OEB	PhD	Professor	and biogeochemistry, remote sensing	OC340, OC498

Faculty Name	Academic Home	Highest Degree	Position Title	Area of Expertise/Interest	Role Within Program
McKay, Jennifer	CEOAS-OEB	PhD	Assist. Prof. (Senior Research)	stable isotopes & trace metals, paleoceanography	OC201
Mix, Alan	CEOAS-OEB	PhD	Distinguished Professor	paleoceanography & paleoclimatology	GEO electives
Nash, Jonathan	CEOAS-POA	PhD	Professor	physics of turbulence & ocean mixing	OC430
O'Neill, Larry	CEOAS-POA	PhD	Associate Professor	air-sea interaction, satellite oceanography near-shore	ATS electives
Ozkan-Haller, Tuba	CEOAS-G&G	PhD	Professor	circulation modeling, sediment transport	OC332
Pearson, Brodie	CEOAS-POA	PhD	Assistant Professor	physics of mixing in the ocean	OC430, OC499
Pettit, Erin	CEOAS-G&G	PhD	Associate Professor	glacier & ice sheet dynamics, ice- ocean interactions	GEO electives
Reimers, Claire	CEOAS-OEB	PhD	Distinguished Professor	benthic biogeochemistry, chemical sensor development	GEO484
Ruggeiro, Peter	CEOAS-G&G	PhD	Professor	coastal geomorphology & coastal hazards	GEO electives
Schmittner, Andreas	CEOAS-POA	PhD	Professor	climate science, ocean biogeochemical cycles	ATS electives
Shearman, Kipp	CEOAS-POA	PhD	Professor	coastal physical oceanography, autonomous underwater vehicles	OC332, OC433

Faculty Name	Academic Home	Highest Degree	Position Title	Area of Expertise/Interest	Role Within Program
Shell, Karen	CEOAS-POA	PhD	Associate Professor	climate dynamics, general circulation of the atmosphere	ATS electives
Skyllingstad, Eric	CEOAS-POA	PhD	Professor	turbulence, ocean- atmosphere coupling	ATS electives
Smyth, William	CEOAS-POA	PhD	Professor	turbulence, thermohaline ciculation, nonlinear waves	ATS electives
Spitz, Yvette	CEOAS-OEB	PhD	Professor	biological modeling	OC340
Stoner, Joe	CEOAS-G&G	PhD	Professor	stratigraphy, paleoclimatology	OC360
Thurber, Andrew	CEOAS-OEB	PhD	Assistant Professor	microbe-metazoan interactions, deep- sea ecology	OC201e, MB electives
Torres, Marta	CEOAS-OEB	PhD	Professor	cold seeps, gas hydrates, geochemical tracers	OC201
Walczak, Maureen	CEOAS-G&G	PhD	Assistant Professor	paleoceanography, ocean-glacier interactions	OC360
Waldbusser, George	CEOAS-OEB	PhD	Associate Professor	ocean acidification, benthic ecology, sediment biochemistry	OC333
Watson, James	CEOAS-GEM	PhD	Assistant Professor	seascape ecology, coastal vulnerability	GEOG electives
Wheatcroft, Rob	CEOAS-OEB	PhD	Rohm Professor,	sedimentation in lakes, estuaries & the coastal ocean	OC201, OC295/6,

Faculty Name	Academic Home	Highest Degree	Position Title	Area of Expertise/Interest	Role Within Program
			Oceanography	,	OC333,
			Director		0C360
Wilson, Greg	CEOAS-G&G	PhD	r Assistant p Professor s	nearshore	
				processes,	OC436
				sediment	
				transport	

Budget Information

Budget Worksheet and Narrative budget_worksheet_Oceanography.pdf Budget_Narrative_Oceanography.pdf

By pressing submit, you are requesting for the existing program to be terminated. A new SIS code will be assigned to the renamed program on approval of this proposal.

Supporting Documentation OC_curriculum_map.pdf

Admin Use Only

Is this program part of a Major Transfer Map (MTM)?

Curriculum Notification

Reviewer Comments

Joseph Fradella III (School of Civil & Construction Engineering, Senior Instructor I) (joe.fradella) (Thu, 20 May 2021 23:13:54 GMT): no concerns Michael Harte (College of Earth, Ocean & Atmospheric Sciences, Professor) (michael.harte) (Thu, 20 May 2021 23:24:18 GMT): CEOAS supports this proposal Susan Rodgers (School of Writing, Literature & Film, Professor, Associate Dean, Honors College) (susan.rodgers) (Fri, 21 May 2021 13:46:13 GMT): No concerns. Kevin Gable (Chemistry, Professor) (kevin.gable) (Fri, 21 May 2021 14:16:05 GMT): You should be aware that by limiting the CH requirements to the first two terms of General Chemistry, students will not receive much (if any) material related to acid/base concepts (including pH and buffers), and no exposure to entropy and free energy. Those are covered in the third term of the sequence.

Heidi Schellman (Physics, Professor) (heidi.schellman) (Fri, 21 May 2021 14:21:37 GMT): Looks exciting. Are you certain that taking PH201/202 (algebra based) is sufficient for the upper division oceanography courses? OSU covers thermodynamics in 202/212, many other institutions do those in 203/213 so there may also be some lack of background in transfer students if only 1-2 are required.

Wade Marcum (College of Engineering, Associate Dean of Undergraduate Programs) (wade.marcum) (Fri, 21 May 2021 14:36:52 GMT): I support

Nicole Kent (College of Forestry, Manager of Undergraduate Curricula & Advising) (nicole.kent) (Fri, 21 May 2021 15:28:53 GMT): No concerns.

Linda Bruslind (Microbiology, Lead Advisor) (bruslindl) (Fri, 21 May 2021 17:13:55 GMT): No concerns

Brock Mc Leod (Integrative Biology, Coordinator of Undergraduate Success & Engagement) (Brock.McLeod) (Fri, 21 May 2021 20:21:31 GMT): The proposal lists BI 211, 212 and 213 which are no longer offered. The new BI 221, 222 and 223 series should be listed instead. The first term, BI 221, is required to take either BI 222 or 223. You can see more about the content by term for the new series at https://catalog.oregonstate.edu/courses/bi/. Jack Istok (School of Civil & Construction Engineering, Associate Head of Undergraduate Affairs) (jack.istok) (Mon, 24 May 2021 15:08:15 GMT): school of CCE. no concerns Robert Wheatcroft (College of Earth, Ocean & Atmospheric Sciences, Professor) (rob.wheatcroft) (Fri, 04 Jun 2021 16:17:17 GMT): Response to comments from 14-day review period: Chemistry and Physics prerequisites: These science prerequisites and most of the upper division OC classes are not changing with the new degree. Because we've not seen any issues under the Ocean Science Option, we're comfortable they are adequate. Also, for students interested in specializing in chemical or physical oceanography, we encourage them to take the third class in the sequence and additional classes in the subject as their schedules and interests permit. Biology classes: This was an oversight on our part. We are aware of the changes to the Biology course numbering and have updated the proposal. Bruce Dugger (Fisheries, Wildlife & Conservation Sciences, Professor) (bruce.dugger) (Sat, 05 Jun 2021 22:37:35 GMT): I'm a little late with my liaison comment, but wanted to chime in that FWCS supports this proposal.

Heath Henry (Academic Programs & Assessment, Assessment Coordinator) (heath.henry) (Thu, 10 Jun 2021 13:23:31 GMT): The assessment plan looks great. The addition of the curriculum map strengthens the plan further. While the program learning outcomes may seem broad, they are clearly meaningful and measurable. The assessment methods align deeply to all aspects of the learning outcomes and will provide excellent data. The benchmarks are also robust and distinctly align with each learning outcome.

Key: 762

Select any proposals you would like to bundle together for approval. Only proposals you have saved are available to bundle.

Bundle Title:
Course: Proposal A Program:
Proposal B