



**NH Department of Education Learn Everywhere Program
Renewal Application
6/17/2022**

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| Sponsoring Organization Name | Seacoast Science Center |
| Name of Primary Contact | Kate Leavitt, Chief Program Officer |
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I. Organizational Details

Organization

It is the mission of the [Seacoast Science Center \(SSC\)](#) to spark curiosity, enhance understanding and inspire conservation of our Blue Planet. Leveraging its remarkable ocean-side location within Odiorne Point State Park, the SSC has cultivated its signature brand of marine and environmental education based on the belief that through first-hand interactions, people establish personal connections with the natural environment. Through these meaningful connections, people's appreciation of our environment and their motivation to take actions in their daily lives to conserve its resources increases, benefitting the sustainability of our Blue Planet.

Seacoast Science Center is open throughout the year serving a broad array of visitors from across the New England region, including 50,000 patrons who come to participate in public programs and view the Center's exhibits, 30,000 students in school-related field trips and camp programs, and 10,000 participants at SSC events or private functions, offering over 30 live animal and interactive exhibits that introduce regionally relevant natural science and cultural history topics. SSC actively engages in wildlife conservation, serving as the federally authorized marine mammal response entity for New Hampshire and northern Massachusetts. The Seacoast Science Center, an independent 501(c)-3 organization, has been providing transformative educational experiences within Odiorne Point State Park since 1992.

SSC believes that through increased awareness and appreciation, people will be motivated to take actions in their daily lives to help to sustain our environment and a healthy World Ocean. To this end, Seacoast Science Center programming includes:

- Educational programs and environmental day camps for children, age 1 to 12th grade.
- A diverse collection of high quality, standards-aligned STEM school programs offered as destination field trips, in-school outreach programs and off site after-school activities.



- Family learning experiences with daily public programs, special after hours family oriented educational programming, and both domestic and international eco-adventure travel.
- Distance learning programs delivered to remote audiences, literally around the world, from SSC's Gregg Interactive Learning Studio
- In concert with the marine mammal conservation activities, the Center has developed numerous school and public programs that feature marine mammals as a case study in ocean health and conservation.
- Community events that have become part of the cultural fabric of seacoast New Hampshire including the Music-by-the-Sea summer concerts, the Rescue Run for Marine Mammals and Earth Day Celebration, World Ocean Day Family Festival, Sippin' for Seals, Veterans Day Science and Nature Extravaganza, and BioBlitz!, a park-wide dawn to dusk species scavenger hunt.

Contact Information

Primary Contact: Kate Leavitt, Chief Program Officer

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II. Program Description

Seacoast Science Center proposes a 0.5 credit Marine Science Certificate (science elective) for consideration in the Learn Everywhere suite of offerings.

- The **Marine Science Fellowship** Certificate (0.5 credit science elective) is a semester-long marine science field science investigation and research learning opportunity for high school sophomores, juniors and seniors.

This certificate is available to high school students in grades 10-12. The course is taught at Seacoast Science Center (SSC), in Rye, New Hampshire. Remote learning may be utilized as necessary, although due to the emphasis on *in situ* hands-on field science most aspects of this course are best experienced in person to maximize practice of new science inquiry skills, engagement with peers and scientists, and to achieve proficiency of competencies. This program will provide students with an introduction to marine biology and marine science, engage students in hands-on field investigations, foster scientific inquiry skills and practices, build self-efficacy around nature of science, and introduce students to local scientists, conservationists, and other career professionals in the marine sciences fields.

III. Policies

Instructor Qualifications

SSC instructors are required to have an undergraduate degree in marine biology, biology, conservation biology, or relative experience in the field, such as five or more years of marine field experience, and/or teaching experience. Our current instructor developed this program and holds a bachelor's in marine biology, as well as ten years of aquaria, lab and teaching experience. SSC confirms that all instructors meet or exceed these standards.



Criminal History Records Check

SSC runs a criminal background check on **all** prospective naturalists (educators/instructors) and staff members prior to hiring. Educators that work in direct contact with students, both onsite and off (outreach), all undergo fingerprinting checks by local police departments. SSC does not allow instruction or student contact by a person who has been charged pending disposition for, or convicted of, any violation or attempted violation of any of the offenses as outlined in RSA 189:13-a, V pursuant to a criminal history records check conducted by the department of safety as outlined in Saf-C 5703.06 through Saf-C 5703.11. SSC confirms that all of our instructors and support staff who will be in contact with students have satisfied our criminal history requirements.

Admissions

This is a semester-long course that requires an application for admission. The application process is not designed, intended, or used to discriminate or violate individual civil rights in any manner prohibited by law, but is used by SSC staff to assess student interests, goals, grade level, credit requirements (if any), and experience. All students are accommodated, regardless of race, ethnicity, religion, and age. Students seeking school credit will be required to disclose their school and district information, including the name and contact information for their school guidance department. SSC Program Director will maintain an annually updated list of the appropriate Local Education Agencies with whom we may need to liaise for each student. Students are admitted on a first-come, first-served basis and financial assistance to cover the cost of the course is available.

Liaison with Local Education Agencies

SSC is committed to providing an accessible learning opportunity for all students and will work with local education agencies to ensure that the learning experience is differentiated appropriately. We understand that we have responsibilities to provide students with disabilities equal access and equal opportunities to participate in the Learn Everywhere program, including providing reasonable accommodations for all students.

IV. Facilities

Educational Facilities Description

Seacoast Science Center is a 15,000 foot museum and learning center located inside Odiorne Point State Park (OPSP). The museum hosts exhibits on ocean and coastal ecology, natural history, and coastal cultural history in addition to numerous aquatic tanks, a shark and skate touch tank and a large 250-gallon intertidal invertebrates touch tank. There are two classrooms in the museum, one of which, the Gregg Interactive Learning Studio (GILS), is used to host the Teen Fellows classes. This classroom has 32 learning stations, an overall capacity of 90, and a teaching station linked to three large screens (each ~5'x6') in the front of the room. The room is flanked by two restrooms, a water fountain/water bottle filling station, and exits to both the museum and outside to the park. The park is comprised of 130 acres of coastal habitat,



including 7 distinct habitats for study, including the rocky intertidal, sandy beach, freshwater pond, and salt marsh.

Students will meet in GILS for lectures, discussions, research project work and may explore the museum and utilize the tanks and exhibits for their research inquiries and to enhance or supplement learning. SSC works in partnership with New Hampshire State Parks, and as such students will have the opportunity to extend their studies with hands-on field experiences right outside the doors of their SSC classroom. Students will safely access the rocky intertidal, sandy beach, freshwater pond and salt marsh in OPSP with their instructor for field investigations and studies.

The combination of live animal tanks, indoor classroom, hands on exhibits, microscopes, water quality and environmental testing equipment, field survey tools, fishing gear, and safe, accessible outdoor field sites, students will have a rich learning environment with both an indoor and outdoor classroom.

Safety Compliance

Our studio space complies with all federal and state safety laws, including all fire codes, including barrier-free access under Abfd 300, code for barrier-free design, and the Americans with Disabilities Act of 1990 (ADA), as amended by the ADA Amendments Act of 2008.

Proof of Insurance

Seacoast Science Center agrees to disclose to Learn Everywhere program participants any insurance Seacoast Science Center maintains which would cover the participants in the Learn Everywhere program.

V. Educational Program

Proposed Certificate for Learn Everywhere program

Seacoast Science Center proposes a 0.5 credit Marine Science Certificate (science elective) for consideration in the Learn Everywhere suite of offerings.

- The **Marine Science Fellowship** Certificate (0.5 credit science elective) is a semester-long marine science field and research learning opportunity for high school sophomores, juniors and seniors. The course will provide students with an introduction to marine biology and marine science, engage students in hands-on field investigations, foster scientific inquiry skills and practices, build self-efficacy around nature of science, and introduce students to local scientists, conservationists, and other career professionals in the marine sciences fields.

The purpose of this certificate course is to offer students a hands-on field science investigation and research introduction to marine biology and marine science. Students will have access to the incredible resources of the Center's fresh and saltwater tanks, museum exhibits,



microscopes, marine life, field research tools, staff scientists and educators, and 130 acres of coastal habitat (rocky intertidal, salt marsh, sandy beach, freshwater pond). The course is taught at Seacoast Science Center (SSC), in Rye, New Hampshire. Remote learning may be utilized as necessary, although due to the emphasis on in situ hands-on field science most aspects of this course are best experienced in person to maximize practice of new science inquiry skills, engagement with peers and scientists, and to achieve proficiency of competencies.

The course is 10 weeks long. Students attend class on Saturdays from 10am-1pm, plus additional study, independent project work and/or volunteer time to be conducted on the student's own time, as arranged by the instructor. Please visit <https://www.seacoastsciencecenter.org/programs/grade-k-12/marine-science-fellowship/> for more information.

Competencies:

- **Scientific Skills and Practices**

Students will demonstrate efficacy and understanding of the NGSS science and engineering skills and practices:

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

in their explorations of the rocky intertidal, sandy beach, salt marsh, and marine lab investigations

- **Nature of Science**

Student will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in a various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research, and effectively communicate the research processes and conclusions.

- **Ecology of Marine and Coastal Ecosystems**

Students will demonstrate an understanding of the interconnectedness of factors that affect population size, health and growth within an ecosystem by investigating coastal systems such as the rocky intertidal, sandy beach and salt marsh. Students will evaluate the claims, evidence and reasoning that complex interactions in ecosystems maintain relative consistency of numbers and types of organisms under stable conditions, but changing conditions may result in new ecosystems or ecosystem dynamics

- **Ocean Literacy**



Students will demonstrate an understanding of the premise that humans and the ocean are inextricably linked with the following guiding principles as the bedrock for class topics, discussions and investigations:

Ocean Literacy Principle #1: The Earth has one big ocean with many features.

Ocean Literacy Principle #2: The ocean and life in the ocean shape the features of Earth.

Ocean Literacy Principle #3: The ocean is a major influence on weather and climate.

Ocean Literacy Principle #4: The ocean made the Earth habitable.

Ocean Literacy Principle #5: The ocean supports a great diversity of life and ecosystems.

Ocean Literacy Principle #6: The ocean and humans are inextricably interconnected.

Ocean Literacy Principle #7: The ocean is largely unexplored.

- **Biodiversity and Natural Selection**

Students will demonstrate an understanding of biodiversity and natural selection by analyzing the biological diversity within a system, the interactions of organisms, and investigating a marine population's habitat, health and adaptations that lead to diversity over time.

- **Marine Chemistry**

Students will demonstrate an understanding of the importance of ocean chemistry and how this relates to the health of different organisms. Students will be able to understand the real world effects of the ocean acidification equation and ways this phenomenon unfolds in the ocean and coastal environment

- **Ocean Productivity**

Students will identify and demonstrate understanding of what makes some ocean zones productive versus others. Students will learn about different zones of the ocean and their relations to productivity

- **Marine Mammals**

Students will investigate the dangers faced by marine mammals and learn more about the marine mammals of the Gulf of Maine and local stranding response and wildlife conservation efforts. Students will meet members of the Marine Mammal Rescue team and other regional marine mammal rescue professionals

- **Marine Science Careers**

Students will understand different career pathways and options in marine sciences. Students will meet a variety of experts, scientists, conservationists and others in the field to gain a better understanding of the diversity of jobs available, current research and work that is happening regionally, skills/education/experience necessary in these roles, and how to pursue them. Students will learn about other programs like this one and college or training opportunities that might help them achieve their goals.

- **Human Impacts on Marine Life**

Students will demonstrate an understanding of the human impact on marine life by researching and reflecting on the history of human impact on marine ecosystems,



investigating the influence of the human impact, including the interrelationships between humans and the living and nonliving marine environment.

- **Ocean and Coastal Conservation**

Students will demonstrate an understanding of conservation and the future of the ocean by researching and examining marine conservation issues that impact the marine environment and providing examples of how to protect our current and future ocean.

Expected Student Outcomes:

Students will be able to:

- practice scientific inquiry skills and practices through hands-on marine science and field science experiences at Seacoast Science Center.
- develop an essential question for independent research / inquiry project that is either exploratory or experimental in design and meets criteria for selection.
- meet and talk with a range of professionals in the marine biology, marine science, ocean conservation and aquaria fields.
- connect to a new network of like-minded peers, marine scientists and environmental conservation professionals.
- understand the impacts (positive and negative) they have on the ocean, the important ecosystem services provided by healthy oceans, bays and waterways, climate-related threats and challenges, and ways we can contribute to a sustainable and healthy ocean.
- work with instructor, peers, and the student science advisory team to design an independent research / inquiry project that is completed over the course of the semester. This project is peer reviewed and findings are communicated via posters and short presentations to family, staff and SSC visitors.

Assessment Plan

Summative assessments of student learning outcomes are expressed in a four-point scale. These four achievement levels are as follows:

- Level 1 (Beginning): The student is beginning the Learning Outcomes.
- Level 2 (Approaching): The student is approaching the Learning Outcomes.
- Level 3 (Meeting): The student is meeting the Learning Outcomes.
- Level 4 (Exceeding): The student is exceeding the Learning Outcomes.

Enrolled SSC Marine Science Fellows seeking Learn Everywhere credit will receive a Final Progress Report, evaluating course outcomes and assigning the student a value between 1 and 4 for each of the six learning outcomes. This Progress Report will be generated by the course instructor and provided upon completion of the course. Students who receive a 3 or 4 in an outcome have met expectations for developing proficiency in the outcome. Once the student achieves this proficiency in each of the six relevant outcomes, the student is awarded a



Certificate. To ensure that our Team Leaders have a clear and sufficient basis on which to establish assessments, we require that students complete their program before receiving their certificate.

Example of Assessment Rubric:

| Marine Science Fellowship Outcomes Final Assessment Rubric | | | | |
|---|--|---|--|---|
| <i>Outcome</i> | <i>Beginning</i> | <i>Approaching</i> | <i>Meeting</i> | <i>Exceeding</i> |
| | The student struggles processing the material and requires additional instruction. | The student struggles with parts of the course, but with proper further instruction can make noticeable improvements. | The student has fundamental understanding of the learned materials and can demonstrate competency with the applied skills. | The student shows exceptional ability and can process and interpret the coursework with few problems. |

Communication of Student Progress

The SSC Program Director and course instructor are consistently engaged in a continuous feedback loop with students throughout the program, including verbal feedback to both the student and their parent(s). Students will receive monthly Progress Reports, letting them know where their assessments stand and how their progress towards a Certificate is proceeding. Should they receive a 3 or higher in all of the Competency categories for their certificate, we will let them know they have completed the requirements and have earned a Certificate. All scores are calculated based on their progress in the course, as observed by the instructor, as well as qualitative feedback from the assistant and head instructors. If requested at time of enrollment, SSC will maintain an agreed upon communications plan with the school liaison.

For each student registered with SSC who is seeking Learn Everywhere credit, we will maintain a Student Scorecard that registers the progress they make on the relevant competencies, with detail on student strengths and challenge areas. In this way, we can maintain a clear record of each student's current progress toward the Certificate.

Student competencies for this certificate are classified as:

- Scientific Inquiry
 - Science and Engineering skills and practices
 - Nature of Science



- Marine Ecology and Coastal Ecosystems
 - Ocean Literacy
 - Biodiversity and Natural Selection
 - Marine Chemistry
 - Ocean Productivity
 - Marine Mammals
- Conservation
 - Human Impacts on Marine Life
 - Ocean and coastal conservation
- Marine Science Careers
 - Career pathways and networking

Formative assessments of student learning outcomes by the instructor will include, but are not limited to, instructor observation of project-based learning, observation of field science skills and practices, including off-site learning projects and competency-based and performance-based assessments of students' progress toward their final research project.

- Students will conduct hands-on field science investigations of the rocky intertidal, sandy beach and salt marsh ecosystems. The small class size (14 students) allows the instructor to work collectively and individually with students to practice comfort and proficiency of different scientific tools and sampling techniques (quadrats, refractometers, thermometers, seine nets, etc.) The instructor will observe students' grasp of the competencies involved and work with students to support skills acquisition.
- Students will engage in a research / inquiry project. They will design, implement, and communicate findings via poster and presentation at a student symposium at the end of the semester. Students will have the opportunity to explore different topics of interest to them within the confines of the assignment and to select an area of research. The research project can be either experiment-based or exploratory/research-based. Students will formulate their own essential question(s) and follow the scientific inquiry process for completion of their final product / research poster: Essential Question, Hypothesis, Introduction, Background, Methods or Comparison, Results, Discussion and Works Cited. Students will work with their peers, the instructor and with the SSC Student Science Advisory Team to formatively assess, tweak and develop their projects.
- Indoor class time not spent on research projects will focus on Marine Science Content-based Competencies, via lectures, class discussions and experiments:

Competencies will be assessed based on student engagement, class discussions, written progress toward final research projects, and student reflections.

Example of a Student Progress Report:

Student Progress Report (Monthly)



| Marine Science Fellowship Certificate | Score | Strengths | Challenges | Opportunities & Recommendations |
|--|--------------|------------------|-------------------|--|
| Beginning | | | | |
| Approaching | | | | |
| Meeting | | | | |
| Exceeding | | | | |