Course Change Request

New Course Proposal

Date Submitted: 11/14/22 8:57 am

Viewing: GEOL 121 : The Changing Ocean Laboratory

Last edit: 11/14/22 8:57 am

Changes proposed by: bklinger

In Workflow

1. **AOES Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Undergraduate
5. Registrar-Courses
6. Banner

Approval Path

1. 11/14/22 8:59 am Mark Uhen (muhen): Approved for AOES Chair

Are you completing this form on someone else's behalf?

No

Effective Term: Fall 2023

Subject Code: GEOL - Geology

Course Number: 121

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: The Changing Ocean Laboratory

Banner Title: The Changing Ocean Laboratory

Will section titles vary by semester? No

Credits: 1

Schedule Type: Laboratory

Hours of Lab or Studio per week: 3

Repeatable: May be only taken once for credit, limited to 3 attempts (N3)

Max Allowable Credits: 1

Default Grade Mode: Undergraduate Regular

Recommended Prerequisite(s):

Recommended Corequisite(s):

GEOL 120: The Changing Ocean

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(	Course/Test Code	Min Grade/Score	Academic Level	)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description:

Our oceans are rapidly changing in response to human-induced and natural catalysts. Students will work with oceanographic data to build an understanding of the chemical, biological, geological, and physical processes that control ocean responses to such catalysts. This course should be taken in conjunction with GEOL 120: The Changing Ocean.

Justification:

The Changing Ocean (GEOL 120-lecture and GEOL 121-lab) courses would be two introductory courses taught in the AOES department that serve both science and non-science majors. The 120/121 courses do not assume that students have had college-level coursework in science.

The 120/121 courses will also help students transferring from Virginia community colleges so that they will have equivalent courses here at Mason, though 120/121 will be taught at Mason. Following approval, the courses will be evaluated to be a part of the Mason Core as Natural Science courses. The course will likely appeal to many Mason students who need flexibility in order to complete 7 credits of Natural Science in the Mason Core.

This course should complement other Mason Core Natural Science offerings, as well as develop new recruits for the Earth Surface Processes, Environmental Geoscience, and Ocean and Estuarine Science concentrations in the Geology BS. We will soon seek Mason Core designation for this course.

Does this course cover material which crosses into another department? No

Learning Outcomes:

1. Plot and interpret an array of oceanographic data types to describe relationships between different variables.
2. Explore the change in the interpretation of a theory when given new evidence.
3. Construct a model of Earth's Energy budget and make predictions.
4. Make predictions about ocean-atmospheric and marine ecosystem responses to various perturbations.
5. Identify geologic materials that compose the seafloor and recognize what factors control their distribution.
6. Practice field and lab techniques employed by oceanographers to study ocean environments.
7. Compare modern rates of ocean-climate change to ancient periods of climate perturbation.
8. Calculate rates and exercise computational skills to assess changing environmental conditions.

Attach Syllabus
GEOL121_TheChangingOceanLab_Syllabus_v3.pdf

Additional Attachments

Staffing:
Brittany Hupp will teach the initial sections of this course. However, several AOES professors and graduate TAs would be able to teach this course.

Relationship to Existing Programs:
This laboratory course is needed to supplement the introductory lecture course, GEOL 120: The Changing Ocean. Together, these courses should complement other Mason Core Natural Science offerings, as well as develop new recruits for the Earth Surface Processes, Environmental Geoscience, and Ocean and Estuarine Science concentrations in the Geology BS. We will soon seek Mason Core designation for this course.

Relationship to Existing Courses:
This laboratory course is needed to supplement the introductory lecture course, GEOL 120: The Changing Ocean. If approved, the proposed courses will be the only introductory-level oceanography courses listed in

the course catalogue. Currently listed upper-level undergraduate oceanography courses include:

GEOL/BIOL/EVPP 309: Oceanography

GEOL/CHEM 458: Chemical Oceanography

GEOL/CLIM 412: Physical Oceanography

All courses listed above are taught at a higher level, are tailored to science majors, and include prerequisites that are not included for proposed 120/121 courses.

The proposed courses also differ from the above course, and from a typical introductory oceanography course, by being taught through the lens of modern ocean issues. The course addresses several key "themes" (e.g., ocean acidification, marine habitat destruction, sea level rise) followed by examination of the physical/chemical/biological/geological processes that dictate these issues and how human action influences changes in these existing natural phenomena. The goal of this course structure is to engage students who are interested in being informed about modern ocean issues they hear about in the media, while simultaneously teaching the foundational topics that prospective/current science majors will need to be successful in higher-level courses.

Additional Comments:

Reviewer Comments

Key: 17962

GEOL 121: THE CHANGING OCEAN LABORATORY

Course Information:

Instructor: Dr. Brittany Hupp
Contact Information: bhupp@gmu.edu
Office Hours: TBD
Class Hours: TBD
Class Location: TBD

Course Description

Our oceans are rapidly changing in response to human-induced and natural catalysts. Students will work with oceanographic data to build an understanding of the chemical, biological, geological, and physical processes that control ocean responses to such catalysts. This course should be taken in conjunction with GEOL 120: The Changing Ocean.

Prerequisites

None. Students must be co-enrolled or have previously successfully completed GEOL 120: The Changing Ocean, the intended lecture course for this lab.

Class Text: Laboratory exercises will be provided by the instructor. However, the following text is recommended as an informational reference to support the lab materials:
Invitation to Oceanography by Paul R. Pinet Paperback, ISBN: 9781284164695

Online Resources:

SERC Oceanography Resources
Woods Hole Ocean Resources
ESA Ocean Virtual Laboratory
Ocean Observatories Initiatve Data Labs

Student Learning Objectives

Upon successful completion of this course, students will be able to:

1. Plot and interpret an array of oceanographic data types to describe relationships between different variables.
2. Explore the change in the interpretation of a theory when given new evidence.
3. Construct a model of Earth's Energy budget and make predictions.
4. Make predictions about ocean-atmospheric and marine ecosystem responses to various perturbations.
5. Identify geologic materials that compose the seafloor and recognize what factors control their distribution.

6. Practice field and lab techniques employed by oceanographers to study ocean environments.
7. Compare modern rates of ocean-climate change to ancient periods of climate perturbation.
8. Calculate rates and exercise computational skills to assess changing environmental conditions.

As a Mason Core Natural Science course, successful completion of this course will also require students to:

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding:
    - evolves based on new evidence
    - differs from personal and cultural beliefs
2. Recognize the scope and limits of science.
3. Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.).
4. Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
5. Participate in scientific inquiry and communicate the elements of the process, including:
    - Making careful and systematic observations
    - Developing and testing a hypothesis
    - Analyzing evidence
    - Interpreting results

Course Structure

Course Requirements and Code of Conduct

Grading: Grading is based on the laboratory exercises given by your instructor. There are 14 laboratory exercises that are equally weighted in determining the final grade.

Final Grade Scale

A+ = 97 – 100%	B+ = 87 – 89%	C+ = 77 – 79%	D = 60 – 69%
A = 93 – 96%	B = 83 – 86%	C = 73 – 76%	F = 0 – 59%
A- = 90 – 92%	B- = 80 – 82%	C- = 70 – 72%	

Attendance: Attendance at all scheduled lecture sections are required to achieve the requisite level of knowledge in this course.

Use of technology: Access to a working computer with a strong internet connection is required for course work done outside of class. During class, please be respectful of our time together and do not engage in activities that are unrelated to class. Cell phones may be left on but muted and used for emergencies only.

Names and Pronouns: I will gladly honor your request to address you by your preferred name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes.

Course Schedule

Week	Theme	Topic
1	Introduction	Intro to Ocean Data Interpretation
2	Issue #1: Issue 1: The Great Pacific Garbage Patch	Earth's Energy Budget
3		Surface Ocean Circulation: Tracking Ocean Currents
4		Deep Ocean Circulation: Predictions in Watermass Movement
5	Issue #2: Ocean Acidification	Seawater Chemistry
6		Ocean Acidification & Impacts
7	Issue #3: Oceanic Dead Zones	Marine Productivity
8		Hypoxia in Coastal Marine Ecosystems
9	Issue #4: Overfishing & Habitat Destruction	Oceanographic Field Methods @ the Potomac Science Center
10		Marine Habitats & Ecosystem Dynamics
11	Issue #5: Sea Level Rise	Waves, Tides, & Coastal Environments
12		Sea Level Rise & Coastal Erosion
13	Issue #6: Climate Change & Our Changing Ocean	Materials of the Seafloor & How We Study Them
14		Past, Present, & Future Oceans

Mason Policy Guidelines
These university and class policies are important to understand:

Disability Accommodations
Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500.
Email: ods@gmu.edu | Phone: (703) 993-2474
Office of Disability Services: http://ods.gmu.edu

Academic Integrity
The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three

fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using the appropriate format for this class. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

If only your name appears on an assignment, your professor has the right to expect that you have done the work yourself, fully and independently. Mason is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Diversity and Inclusion

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

The reflection of Mason's commitment to diversity and inclusion goes beyond policies and procedures to focus on behavior at the individual, group and organizational level. The implementation of this commitment to diversity and inclusion is found in all settings, including individual work units and groups, student organizations and groups, and classroom settings; it is also found with the delivery of services and activities, including, but not limited to, curriculum, teaching, events, advising, research, service, and community outreach.

Acknowledging that the attainment of diversity and inclusion are dynamic and continuous processes, and that the larger societal setting has an evolving socio-cultural understanding of

diversity and inclusion, Mason seeks to continuously improve its environment. To this end, the University promotes continuous monitoring and self-assessment regarding diversity. The aim is to incorporate diversity and inclusion within the philosophies and actions of the individual, group and organization, and to make improvements as needed.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

Notice of mandatory reporting of sexual or interpersonal misconduct: As a faculty member, I am designated as a "Non-Confidential Employee," and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, stalking, sexual exploitation, complicity, and retaliation to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

Privacy

Students must use their MasonLive email account to receive important University information, including messages related to this class. Please see http://masonlive.gmu.edu for more information.