Course Change Request

New Course Proposal

Date Submitted: 03/03/22 12:45 pm

Viewing: GGS 106 : Climate Change and a Sustainable Earth

Last edit: 03/24/22 8:16 pm

Changes proposed by: nburtch

In Workflow

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

Approval Path

1. 03/03/22 12:46 pm Nathan Burtch (nburtch): Approved for GGS Chair

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

No

Effective Term: Fall 2022

Subject Code: GGS - Geography & Geoinformation Science

Course Number: 106

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Climate Change and a Sustainable Earth

Banner Title: Climate Change & Sustain Earth

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

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

Max Allowable Credits:

9

Default Grade Mode: Undergraduate Regular

Recommended Prerequisite(s):

Recommended Corequisite(s):

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:

A multidisciplinary, Earth systems approach to the impacts of climate change on natural resources. Examines the basic scientific principles of climate change in order to develop long-term strategies on the sustainability of water, energy, and food/agricultural resources, and the impacts upon human health. Examines the current science of climate change as applied to social, economic, and political science, to understand Earth as an interconnected, integrated biological and physical system.

Justification:

What:
Creating a new 100-level course exploring climate change and sustainability from a geographic Earth systems approach.

Why:
Climate change is one of the great challenges for natural resources and human habitability on Planet Earth. This proposed new course is intended to broaden the academic program of studies for a wide range of students because of the multidisciplinary nature of climate change impacts on society. We believe that there is a greater need to provide academic program courses to a wide student audience with the aim of enhancing knowledge of the issues, exposing students to the challenges that face them, and promoting greater opportunities to meet these challenges. Currently, it is an urgent need at Mason to introduce the climate change and its impact on water-energy-food-health (WEFH) nexus at the undergraduate lower level.

The new proposed course covers climate change, the Earth system and its impact of natural resources. The Earth systems approach is one focus area within the GGS Department. John Qu, the intended main professor of this course, is a full professor in GGS and an Institute for a Sustainable Earth (ISE) faculty fellow. John Qu is also the co-author (with Raymond Motha of the Global Environment and Natural Resources Institute at GMU) of the forthcoming textbook "Climate Change and a Sustainable Earth". The book is due for release on April 1st, 2022 through Cambridge Scholars Publishing (https://www.cambridgescholars.com/product/978-1-5275-8044-2).

We believe this new multidisciplinary course will be attractive to students across the Mason campus, and plan to apply for core class status after the course is established. This class is designed to enhance and build upon existing lower level courses that focus on climate change. This Earth systems approach to climate change, resources, and sustainability will be properly housed within Geography and Geoinformation Science, with the goal of enhancing current lower level courses at Mason that focus on climate action and sustainability. This GGS 106 course's lens of the integrated biological and physical systems of Earth should enhance current Mason offerings, such as CLIM 101 and 102. GGS 106 will build upon the solid foundation of CLIM courses, and this greater structure of climate change perspectives is needed for educational programming around the Mason Climate Action Plan.

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

Learning Outcomes:

Attach Syllabus
GGS106_New_Course_Proposal_V1.pdf

Additional Attachments

Staffing:

Dr. John Qu and Dr. Raymond Motha as the main instructors (and writers of the intended textbook for the course).

Relationship to Existing Programs:

GGS 106 will enhance GGS offerings in physical geography in the BA and BS GEOG degrees. Additionally, this course can be included in interdisciplinary minors such as STEM in Society, Renewable Energy Interdisciplinary, and Sustainability Studies.

Relationship to Existing Courses:

At the lower undergraduate level, CLIM offers CLIM 101 and CLIM 102. CLIM 102 is a lab science course on climate change. CLIM 101 is focused on "Weather, Climate, and Society". Our proposed course differs by offering an Earth systems approach, investigating the integrated biological and physical systems of Earth and how climate change affects the sustainability of water resources, agriculture, energy, and human health. INTS 210 is a broader course on sustainability. ECON 105 focuses on economic concepts applied to environmental policy. GGS 102, 121 and 122 use an Earth Systems approach to study the physical earth broadly, and touch up climate change, but the proposed course is more focused on climate change plus the policy and society perspectives.

Additional Comments:

Reviewer Comments

Key: 17558

Climate Change and a Sustainable Earth

Course number: GGS106

Instructors: John J. Qu and Raymond P. Motha

Department of Geography and Geoinformation Science (GGS)

College of Science (COS)

Catalog description: A multidisciplinary, Earth systems approach to the impacts of climate change on natural resources. Examines the basic scientific principles of climate change in order to develop long-term strategies on the sustainability of water, energy, and food/agricultural resources, and the impacts upon human health. Examines the current science of climate change as applied to social, economic, and political science, to understand Earth as an interconnected, integrated biological and physical system.

Course description:

Climate change and its impacts on natural resources are among the greatest challenges that threaten Earth. This course focuses on the understanding of basic scientific principles of climate change to help develop long-term strategies to cope with the resulting broader environmental, societal, and economic impacts. A multidisciplinary approach combines the principles of changing climate with the specialized fields of water, energy, food, and human health (WEFH). The WEFH nexus plays a key role in how the Earth operates as an interconnected, integrated system. This course is intended to broaden the academic program of studies for a wide range of students due to the multidisciplinary nature of climate change impacts on society. The contents of this course will be used within the textbook entitled "Climate Change and a Sustainable Earth" dealing with past, current and future scientific evidence and facts, and provide ideas and considerations for future analysis of climate change impacts. The organizational structure of this course focuses on the Earth system approach to climate change. This course is tailored generally to students who are enrolled in a range of multidisciplinary science programs, such as atmospheric and environmental science, biology and ecosystems, hydrological, energy and agricultural sciences, geographical sciences, and natural resource management. We believe that there is a greater need to provide academic program course to a wide student audience with the aim of enhancing knowledge of the issues, exposing students to the challenges that face them, and promoting greater opportunities to meet these challenges.

Prerequisites: None

Credits: 3

Textbook: "Climate Change and a Sustainable Earth", John J. Qu and Raymond P. Motha, 2022, Cambridge Scholars Publishing, ISBN: 978-1-5275-8044-2.

Grading

Grades will be based upon students' performance on the homework exercises, midterm, quizzes, and final exam. The weighted contribution of each of these items to your final grade is given below:

- Quizzes 20%
- Homework 20%
- Midterm 25%
- Final exam 35%

(A=90-100, B=80-89, C=70-79, D=60-69, F=<60)

Detailed Schedule

Week 1 Introduction & Indicators of Climate Change and Climate Observations

Week 2 Physical Foundations of Climate Change

Week 3 Global General Circulations and Teleconnections **(Quiz 1)**

Week 4 The Atmosphere

Week 5 The Hydrosphere

Week 6 The Cryosphere

Week 7 The Biosphere (Quiz 2)

Week 8 The Earth System: A Nexus Approach to Human Activity (**Mid-term**)

Week 9 Climate Impacts on Water Sustainability

Week 10 Climate Impacts on Energy Sustainability **(Quiz 3)**

Week 11 Climate Impacts on Agricultural Sustainability

Week 12 Climate Change Impacts on Human Health

Week 13 Climate Change and the Sustainable Earth Nexus

Week 14 Innovative Technologies for Monitoring Climate Change **(Quiz 4)**

Week 15 Final Exam

University Policies

The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.

GMU email accounts

Students must use their Mason email accounts-either the existing MEMO system or a new MASONLIVE account to receive important University information, including messages related to this class. See http://masonlive.gmu.edu for more information.

Honor Code

Students must strictly follow the honor code, both for individual and teamwork. No exception will be made. University policy requires that faculty members report incidents of Honor Code Violation. Scholastic dishonesty includes but is not limited to plagiarism (reference your sources and quotations), copying others' work, limiting others' access to course materials, sabotaging others' work, turning in the same paper or project for two classes without permission from all instructors, and many other things. You are responsible for the GMU Scholastic Honor Code, found in the GMU University Catalogue.

Students with Disabilities

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Resources at 703/993-2474. All academic accommodations must be arranged through that office.

Student use of electronic devices

The use of computers, either lab desktops or personal laptops, is required for the course. You will only be permitted to work on material related to the class, however. Engaging in activities not related to the course will result in a significant deduction in your participation grade. Please be respectful of your peers and instructor and avoid email, social media, and other distracting uses of computers.

Class Cancellation

If a class is cancelled due to inclement weather or other reasons, the syllabus will be updated as early as possible. Best efforts will be made to send each student an email with information on the cancellation of class. Make up classes will be scheduled during the next lecture. When an exam is cancelled, it will be given during the next lecture.