

# Course Change Request

## New Course Proposal

Date Submitted: 12/03/19 10:39 am

Viewing: **CONS 210 : Inquiry and Design**

Last edit: 12/03/19 10:39 am

Changes proposed by: atriple2

### In Workflow

1. **CONS Director**
2. **LA Associate Dean**
3. **SC Associate Dean**
4. UN Academic Affairs  
Dean
5. Assoc Provost-  
Undergraduate
6. Registrar-Courses
7. Banner

### Approval Path

1. 12/03/19 10:51 am  
Cody Edwards  
(cedward7):  
Approved for CONS  
Director
2. 12/19/19 4:36 pm  
Jill Bowen  
(jbowen4):  
Approved for LA  
Associate Dean

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

Yes

Requestor:

Name	Extension	Email
Stephanie Lessard-Pilon	540-635-0471	slessar2@gmu.edu

Effective Term: Fall 2021

Subject Code: CONS - Conservation Studies

Course Number: 210

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Inquiry and Design

Banner Title: Inquiry and Design

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:** 3

**Default Grade Mode:** Undergraduate Regular

**Recommended Prerequisite(s):**

**Recommended Corequisite(s):**

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

CONS 120: Grand Challenges in Conservation or permission of instructor

**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:**

This course builds skills in scientific inquiry and experimental design as it relates to biodiversity conservation. Students will be introduced to the scientific method and how to select research questions. They will develop an independent project enabling them to practice developing a hypothesis, design a study, perform a literature review, collect and analyze original data using summary statistics, and present their findings to their peers. This class will build from the CONS 120 Grand Challenges in Conservation

course and introduce methods from social sciences and quantitative analysis, to enable students to decide which follow-up data analysis course is most appropriate for their interests.

**Justification:**

Many students arrive at universities with misconceptions about the scientific method, process and study design that persists throughout their undergraduate education and even beyond. To counter this early in the students' academic career, this course will explicitly address these misconceptions and will introduce students to the basics of experimental design in both conservation sciences and social sciences by working through the design of an actual experiment. It also includes content to build scholarly skills that will serve them well in more advanced courses, e.g. how to conduct literature reviews, understand research ethics and communicate their findings. This foundational course will prepare students to engage in the rest of the core curriculum for the Biodiversity Conservation major under development.

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

**Learning Outcomes:**

By the end of the course, students will be able to:

- Obtain a broad understanding of research strategies and techniques to appropriately design a conservation study
- Independently design a scientific question and experiment
- Describe the importance of the scientific method and conducting ethical research
- Conduct a literature review and articulate the importance of evaluating scientific results in light of previous studies
- Use information collected through literature review to inform the development of a novel experiment
- Effectively communicate research findings to public and professional audiences

**Attach Syllabus**

[CONS 210 Inquiry and Design for Ecology and Conservation \(1\).pdf](#)

**Additional Attachments**

**Additional Comments:**

**Reviewer Comments**

## CONS 210 Inquiry and Design

3.0 credits

### Instructors:

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### Course Description:

This course builds skills in scientific inquiry and experimental design. Students will be introduced to the scientific method and how to select research questions. They will develop an independent project enabling them to practice developing a hypothesis, design a study, perform a literature review, collect and analyze original data using summary statistics, and present their findings to their peers. This class will build from the CONS 120: Grand Challenges in Conservation course and introduce methods from social sciences and quantitative analysis, to enable students to decide which follow-up data analysis course is most appropriate for their interests.

### Objectives:

*By the end of the course, students will be able to:*

- Obtain a broad understanding of research strategies and techniques to appropriately design a study to answer scientific questions
- Independently design a scientific experiment
- Describe the importance of the scientific method and conducting ethical research
- Conduct a literature review and articulate the importance of evaluating scientific results in light of previous studies
- Use information collected through literature review to inform the development of a novel experiment
- Effectively communicate research findings to public and professional audiences

### Prerequisites

Students should have successfully completed CONS 120: Grand Challenges in Conservation.

### Readings and Other Course Materials

Karban, R., Huntzinger, M., and Pearse, I.S. How to Do Ecology: a Concise Handbook. 2<sup>nd</sup> Edition. Princeton, New Jersey: Princeton University Press, 2014. ISBN: 0691125775

### BlackBoard

Some readings for the class will be accessible from our course via BlackBoard 9.1. You will access BlackBoard 9.1 via the MyMason portal (<http://mymason.gmu.edu>) using the browser of your choice. Enter the username and password from your GMU email account and then click on the “Courses” tab at the top, right side of the page.

## Assignments

Detailed descriptions of each of these assignments, including grading criteria, are found on the program's Blackboard site in the *Assignments* section.

### Research ethics activity (10%)

Students will develop their own research ethics statement. The statement should include an overview of credit for work done (including authorship), data management (how is data acquired, managed, stored, shared, and who is responsible for it), peer review, policies for working with human or animal subjects, how to handle conflicts of interest, and the social responsibilities of researchers.

### Independent project (65%)

- Hypothesis proposal (10%)
- Literature review (15%)
- Methods and analysis (15%)
- Final presentation (25%)

### Weekly quizzes (10%)

At the beginning of class each week, a short quiz will test concepts from the previous week's lectures

### Participation (15%)

Active participation in all activities, assignments and discussions is required. Participation includes both attendance and engagement.

## Grading

Grades for individual assignments and overall will be assigned on the following scale:

<b>A+</b>	97% - 100%	<b>C+</b>	77% - 79.9%
<b>A</b>	93% - 96.9%	<b>C</b>	73% - 76.9%
<b>A-</b>	90% - 92.9%	<b>C-</b>	70% - 72.9%
<b>B+</b>	87% - 89.9%	<b>D</b>	60% - 69.9%
<b>B</b>	83% - 86.9%	<b>F</b>	< 60%
<b>B-</b>	80% - 82.9%		

## Class Absences

Students are expected to attend each class session. Many assignments are based on in-class experiences and cannot be replicated. Attendance contributes to your participation grade. Any absence from classes or exams must be pre-approved by a faculty member and must fit the

criteria for a university-sanctioned absence (e.g. religious holiday, university-sponsored activities, verified illness, death in the family). Please consult faculty if you have any questions.

### **Late Policy**

You are responsible for completing assignments on time. Assignments submitted late will lose 10% for each day they are past due, including Fridays, Saturdays, and Sundays up to 5 days, after which the maximum you can earn for an assignment is 50%. Due dates are clearly indicated on Blackboard. Assignments may only be made up if failure to attend class and/or complete required assignments was for a prior excused absence or emergency. Full or partial credit for missed in-class assignments, activities and field trips may only be made up based on prior notification of an excused absence or an emergency, as agreed upon with the faculty point of contact.

### **University Policies**

The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty and staff conduct in university affairs.

### **Laptops**

If necessary, you may bring a laptop to class and use it for class-related purposes (e.g. taking notes). During class, please refrain from using your laptop for purposes not related to class (e.g. email, IM, surfing the Internet).

Using devices for non-class related purposes is distracting and disrespectful to your fellow students and instructors and is not part of being actively engaged in class activities.

### **Paperless Classroom**

We will use the Blackboard online course management system to minimize paper use. Learning community members will also engage in a discussion on the first day of class about strategies for conserving paper. Our aim is to collaboratively adopt policies that will balance academic needs with resource conservation concerns.

### **Phones**

Please keep your phone shut down and out of sight during class.

### **Academic Integrity**

GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. Studying in groups and working collaboratively are not violations of the Honor Code, but the Honor Code does require that work that you (as an individual) turn in is your own individual synthesis or integration of ideas in your own words, and that the work a group turns in ultimately be the product of the group's collective 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. If you have any questions at all about the line between collaboration and cheating, ask an instructor. Always cite your sources using the APA method. If you do not, it is plagiarism. Plagiarism is lifting someone else's ideas or words and presenting them as your own without proper attribution of the source. This includes all sources, including those found on the Internet. The principle of academic integrity is taken very seriously and violations are treated gravely. When in doubt (of any kind) please ask for guidance and clarification.

### **Mason Email Accounts**

Students must use their Mason email accounts to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

### **Office of Disability Services**

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at (703) 993-2474. All academic accommodations must be arranged through the ODS. <http://ods.gmu.edu>

### **Other Useful Campus Resources**

WRITING CENTER: A114 Robinson Hall; (703) 993-1200 or Prince William Campus (703) 993-8451; <http://writingcenter.gmu.edu>

UNIVERSITY LIBRARIES “Ask a Librarian”

<http://library.gmu.edu/mudge/IM/IMRef.html>

COUNSELING AND PSYCHOLOGICAL SERVICES (CAPS): (703) 993-2380;

<http://caps.gmu.edu>

### **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.

### **Our Commitment to Diversity**

The Smithsonian-Mason Semester is an intentionally inclusive community, and promotes and maintains an equitable and just work and learning environment. We welcome and value individuals and their differences including race, economic status, gender expression and identity, sex, sexual orientation, ethnicity, national origin, first language, religion or irreligion, age and disability.

- We value our diverse student body and desire to increase the diversity of our faculty and staff.
- We commit to supporting students, faculty and staff who have been the victims of bias and discrimination.
- We promote continuous learning and improvement to create an environment that values diverse points of view and life experiences.
- We believe that faculty, staff and students play a role in creating an environment that engages diverse points of view.
- We believe that by fostering their willingness to hear and learn from a variety of sources and viewpoints, our students will gain competence in communication, critical thinking and global understanding, aware of their biases and how they affect their interactions with others and the world.

### Preliminary Course Schedule

Week	Topic	Readings/Assignments
Week 1	Introduction to science and inquiry	<i>Readings:</i> Dow, P. (2000). Why inquiry? A historic and philosophical commentary. In <i>Foundations</i> pp 5-9. <a href="https://www.nsf.gov/pubs/2000/nsf99148/ch_1.ht">https://www.nsf.gov/pubs/2000/nsf99148/ch_1.ht</a>
Week 2	Measurement and validity (accuracy, precision and bias, QAQC)  In class activities: Measurement, precision and repeatability games; data collection and management	<i>Readings:</i> Cox, G. (2001). General Ecology Laboratory Manual: Chapter 1  <i>Assignments:</i> Weekly quiz
Week 3	Research ethics: Integrity as a researcher  The ethics of manipulative research	<i>Readings:</i> Crozier, G; Schulte-Hostedde A. (2015). Towards improving the ethics of ecological research. <i>Sci Eng Ethics</i> 21:577-594  <i>Assignments:</i> Weekly quiz



<b>Week 4</b>	<p>Study types (pilot, meta-analysis, observational vs manipulative)</p> <p>The scientific figure</p>	<p><i>Readings:</i> Rolandi, M., Cheng, K., and Pérez-Kriz, S. (2011). A Brief Guide to Designing Effective Figures for the Scientific Paper. <i>Advanced Materials</i> 23: 4343-4346.</p> <p><i>Assignments:</i> Weekly quiz</p>
<b>Week 5</b>	<p>Quantitative and qualitative research approaches: Overview and discussion of examples from the literature</p>	<p><i>Assignments:</i> Weekly quiz &amp; research ethics statement due</p>
<b>Week 6</b>	<p>Developing scientific questions and hypotheses (null and alternative hypotheses)</p>	<p><i>Readings:</i> Karban et al, Chapters 1-2</p> <p><i>Assignments:</i> Weekly quiz</p>
<b>Week 7</b>	<p>Experimental design (independence, replication, controls); study design critique and evaluation</p>	<p><i>Readings:</i> Karban et al, Chapter 3</p> <p><i>Assignments:</i> Weekly quiz &amp; Question/Hypothesis proposal due</p>
<b>Week 8</b>	<p>Project: data collection (public data sources)</p> <p>Where to find online ecological data repositories, sample questions and time for independent work</p>	<p><i>Readings:</i> Spend some time looking up resources related to your potential research questions</p> <p><i>Assignments:</i> Weekly quiz</p>
<b>Week 9</b>	<p>Project: data collection (literature review)</p>	<p><i>Readings:</i> Cox, Chapter 5</p> <p><i>Assignments:</i> Weekly quiz &amp; literature review due</p>
<b>Week 10</b>	<p>Summary statistics (mean, mode, standard error, standard deviation), selection of what to report; understanding data distributions, using Excel</p>	<p><i>Readings:</i> Karban et al, Chapters 4-5</p> <p><i>Assignments:</i> No quiz this week</p>
<b>Week 11</b>	<p>Project: Data analysis</p>	<p><i>Readings:</i> Cox, Chapter 4</p> <p><i>Assignments:</i> Weekly quiz</p>

<b>Week 12</b>	Writing scientific reports	<p><i>Readings:</i> Karban et al, Chapter 8 (119-137)</p> <p><i>Assignments:</i> No quiz this week</p>
<b>Week 13</b>	Project: Data analysis & discussion of preliminary results	<p><i>Assignments:</i> No quiz this week; Methods &amp; data analysis due</p>
<b>Week 14</b>	Giving professional presentations	<p><i>Readings:</i> Karban et al, Chapter 8 (138-154).</p> <p>Bourne, P. E. (2007). Ten simple rules for making good oral presentations. PLoS Comput Biol 3(4): e77. doi:10.1371/journal.pcbi.0030077</p> <p>Lortie, C.J. (2017). Ten simple rules for short and swift presentations. PLoS Comput Biol 13(3): e1005373. doi:10.1371/journal.pcbi.1005373</p> <p><i>Assignments:</i> Weekly quiz</p>
<b>Week 15</b>	Presentation work time and rehearsals	<p><i>Assignments:</i> No quiz this week; work on your presentations!</p>
<b>Week 16</b>	Final presentations	<p><i>Assignments:</i> Final presentations due</p>