

## Call for Proposals for First-Year Seminar

First-year seminars will be distributed across the disciplines, yet they are structured around a set of common student learning outcomes whose purpose is to introduce first-year students to the pursuit of intellectual inquiry while developing some of the fundamental skills necessary for success in a rigorous academic setting: information literacy and strong written and oral communication skills. Specific topics are determined by the instructor's background and interests. The objective of the first-year seminar is to cultivate the intellectual skills necessary for liberal learning through the in-depth study of a topic and the provision of instruction on how to gather and analyze information for the purpose of formulating and defending an opinion. Seminars will be deep in terms of the critical approach employed, but will involve topics that are accessible to first-year students. In addition, first-year seminars anticipate the experience of the senior seminar without the requisite background knowledge and skills that such seminars demand.

All first-year seminars involve meaningful writing and speaking assignments in which students are given instruction and guidance on writing and speaking at the college level. Resources provided by the QEP are being used to enhance the services offered by the Speaking and Writing Center so that instructors can lean on these centers as they develop this portion of their course. Contact the Director of the Writing Center, Gwen Hale ([ghale@umw.edu](mailto:ghale@umw.edu)), or the Director of the Speaking Center, Anand Rao ([arao@umw.edu](mailto:arao@umw.edu)), for assistance on how the centers can help you. Peter Catlin ([pcatlin@umw.edu](mailto:pcatlin@umw.edu)) of Simpson Library is also a valuable resource for providing instruction on information literacy and a robust introduction to library resources.

**Every course should have the following basic components and use the new student learning outcomes.**

First-year seminars will

- utilize active, discussion-based, participatory learning;
- be exploratory in nature, rather than just presenting conclusions;
- have students read primary sources, not simply textbooks;
- have students synthesize material from multiple sources to develop their own views on the topic; and
- be capped at 15 students.

Student Learning Outcomes (must be included on your syllabus!)

Upon successful completion of an FSEM, students will

- utilize a variety of research techniques to retrieve information efficiently, evaluate retrieved information, and synthesize information effectively to support their messages or arguments;
- improve development and organization of written arguments;
- demonstrate the ability to edit and revise in the writing process;
- apply the basic theories and principles of oral communication; and
- communicate effectively in a variety of settings, including public speaking and group discussion.

We are looking for seminars, not traditional courses, which illustrate the sort of intellectual inquiry higher education can offer. See, for instance, the sample syllabus appended to this document. In other words, you should not take an existing course and re-title and re-number it.

As we transition to all first-year students taking FSEM their first semester, instructors of FSEM should recognize that first-year advising will merge with the seminar program. FSEM instructors will be asked to devote a small portion of class time to advising issues and will be expected to meet their students individually for advising purposes. The Office of Academic and Career Services will be working with faculty in this endeavor and faculty will not be expected to develop advising materials. It is our hope that a collaborative program between first-year seminar instructors and the staff in the Academic and Career Services is a sound model for the academic component of the first-year experience.

**FIRST-YEAR SEMINAR COURSE PROPOSAL**  
UNIVERSITY OF MARY WASHINGTON

Use this form to submit **FSEM 100 topics** courses for review **or** any **other existing course** that you wish to have designated to meet the first-year seminar requirement.

<b>COURSE NUMBER:</b>	<u>FSEM 100</u>		
<b>COURSE TITLE:</b>	<u>CLIMATE CHANGE AND ENERGY RESOURCES</u>		
<b>SUBMITTED BY:</b>	<u>Charles Whipkey</u>	<b>DATE:</b>	<u>11-19-2014</u>
<i>This course proposal has the department's approval. (Put a check in the box to the right.)</i>			<input checked="" type="checkbox"/>

**COURSE DESCRIPTION.** In the space below, provide a one- to two-sentence description of this class. The description will be entered in Banner and will also be used in other publications about the first-year seminar program (such as the “Eagle Essentials” booklet).

Climate change is one of the most controversial and important topics of this century. In this class we will evaluate the evidence that human use of fossil fuels is responsible for altering Earth's climate, and we will examine alternative energy sources and policies that might address the problem.

**RATIONALE.** Include short statement addressing how this course meets the FSEM's basic components and new student learning outcomes (see FSEM call above), and why this course should be approved to meet the FSEM General Education requirement.

This class will attempt to fulfill the FSEM pedagogical goals of participatory and exploratory learning by systematically helping students to build up a base of knowledge in several areas related to global climate change, in order to develop a comprehensive view of the issues involved and to develop a well-reasoned strategy for dealing with problem. The course is divided into three parts. In Part 1, the basic science of greenhouse gases, fossil fuels, and Earth's climate is developed primarily through independent reading and class discussion. In Part 2, alternative sources of energy are researched and their potential to ameliorate a warming climate is evaluated through presentations and class conversation. In Part 3, policy solutions and media accounts of climate change will be evaluated with in-class discussion and with individually-researched media critiques. Finally, each student will bring together all the threads of the class to in a term paper that both demonstrates an understanding of the issues and presents a well-argued and well-supported strategy for slowing the rate of climate change, or alternatively, explaining why such a strategy is unnecessary or undesirable. This class fulfills FSEM requirements for critical reading, use of a variety of research techniques, oral and written communication, and synthesis of a variety of sources to develop a view on this important topic.

**SYLLABUS.** *Attach a course syllabus.*

**SUBMIT** this form and attached syllabus **electronically as one document** to Dave Stahlman ([wdstahlm@umw.edu](mailto:wdstahlm@umw.edu)). All submissions **must** be in electronic form.

## FSEM 100: Climate Change and Energy Resources

**Instructor:** C. E. Whipkey Office: 441 Jepson  
Email: [cwhipkey@umw.edu](mailto:cwhipkey@umw.edu) Phone: 654-1428

Office hours: Tue. 3:15 PM - 4:15 PM  
Wed. 10:50 PM – 11:50 PM; 1:00 PM – 3:00 PM  
Thu. 3:15 PM - 4:15 PM  
Additional hours by appointment.

*This class meets Tuesdays and Thursdays from 2:00 to 3:15 PM in 313 Jepson.*

### Course Overview

*Rationale for this course:* Many people, including most climate scientists, have concluded that human-generated (anthropogenic) greenhouse gases, including carbon dioxide (CO<sub>2</sub>) emissions from fossil fuels, are creating profound changes in the Earth's climate system. Many have concluded that these changes are going to get *much* more pronounced if we continue to burn oil, natural gas, and coal at the present rate, let alone at the vastly increased rate that is likely as more countries jump on the industrial bandwagon. In their view, we need to begin using alternative energy sources at a *large scale* and we need to do it *soon*. Does this view represent reality and, if so, are alternatives available that can replace fossil fuels? Even if alternatives are up to the task, can we manage such a massive change in our energy infrastructure in time to make a difference?

*Structure of the course:* In Part 1 we will evaluate the evidence that human use of fossil fuels is responsible for altering Earth's climate. Is the evidence compelling? Are alternative views valid and based on scientific evidence, or are they political in nature or based on wishful thinking? How can we, as non-specialists, evaluate highly technical evidence? During Part 1, we will examine and discuss the scientific evidence related to climate change, so we will have a shared base of knowledge for subsequent class discussions.

Whatever we conclude regarding the *validity* of climate change, governments worldwide are already pushing for increased use of renewable energy to address the issue. In Part 2, we will become familiar with the major alternative energy sources. How do they work? Are they practical solutions or "green" fantasies? "Resource groups", each consisting of three students, will become familiar with one of five potential resources: solar, nuclear, wind, biomass, and hydrogen fusion. Each group will prepare materials for the class and lead a discussion of their assigned resource, including an assessment of its potential to play a major role in our energy future.

In Part 3, armed with information gained in Parts 1 and 2, we will scrutinize the political and media response to the threat of climate change and the possible solutions. What can be done to reduce dependence on fossil fuels and promote renewables? How accurately do the popular media and politicians present this issue?

Finally, you will synthesize the knowledge you have acquired determine what type of policies you believe would be most effective in moving away from fossil fuels and toward renewable energy. Should we encourage *specific* energy sources, or should we provide incentives for CO<sub>2</sub> reduction and allow the marketplace to decide how to meet them? If incentives are the way to go, what types of incentives would be most effective?

*Course objectives:* During this course we will evaluate the scientific basis for claims of human-caused climate change, investigate alternative energy sources, examine how the media discuss these issues, and discuss the pros and cons of policy prescriptions designed to encourage a transition to renewable energy. In the end, you will formulate a well-supported recommendation for addressing the issues involved. In this course:

You will investigate the basic science underlying greenhouse gases and their effects on Earth's climate. You and your classmates will evaluate predictions that increased levels of greenhouse gases are, or are not, responsible for a warming earth. We'll read some of the earliest scientific papers on this topic, and view more recent reports, websites, and other media sources.

You will explore the scientific and technical nature of the major potential alternatives to carbon-emitting fossil fuels, and as a class we will evaluate the pros and cons of each source. Technical material, including government websites, will be scrutinized, and we will examine the popular and semi-popular press for insight into the practicality of energy sources.

Finally, you will examine various structures for encouraging the transition to renewable energy for political feasibility, practicality, and effectiveness. You will assess theoretical models as well as case studies, where available. You will scrutinize the media and political response to the climate issue.

As a capstone to the course, you will bring together all you have learned to prepare your assessment of our current climate and energy situation and your recommendations for future actions.

Climate Change and Energy Resources fulfills UMW's Freshman Seminar (FSEM) requirement, and is intended to introduce students to college level research, discussion, oral presentation and writing. Upon successful completion of this or any FSEM, students will have demonstrated abilities in the following areas:

- utilizing a variety of research techniques to retrieve information efficiently, evaluate retrieved information, and synthesize information effectively to support their messages or arguments;

- development and organization of written arguments

- the ability to edit and revise in the writing process

- application of the basic theories and principles of oral communication

- the ability to communicate effectively in a variety of settings, including public speaking and group discussion.

### Course Components

**Attendance and Participation:** This is a seminar class and as such it can be successful only if students are present and take the initiative during our discussions. Make notes of items that catch your attention in the readings, and bring those points up for discussion. Be prepared to defend any position that you take because others may disagree. Participation will be assessed by the instructor based on attendance, contribution, peer-review of oral presentations, and the willingness to lead discussion.

**Mid-term exam and quizzes:** To ensure that everyone is up to speed on the basic science of atmospheric greenhouse gases and their effects on climate there will be a mid-term exam after completion of Part 1. On-line quizzes on energy resources will be given during Part 2.

**Discussion:** Class discussions could be in various formats, and will sometimes be led by one or more students. Discussion leaders will summarize the main points of the issue and ask for feedback from the class. Other formats might be explored, perhaps including debates, on-line discussions, etc. Some discussions will be based on materials we have been able to study in advance, while others will be based on media (e.g. films) that are viewed right before the discussion.

**Resources** for our discussions could include books, films, TV, the Internet, print media, and whatever else they invent over the next few months. A partial list of expected resources:

Intergovernmental Panel on Climate Change (IPCC): *Climate Change 2014; Synthesis Report, including the Summary for Policy Makers*

Intergovernmental Panel on Climate Change (IPCC): *Climate Change 2014; Mitigation of Climate Change, including the Summary for Policy Makers*

Intergovernmental Panel on Climate Change (IPCC): *Climate Change 2013; The Physical Science Basis, including the Summary for Policy Makers*

Fay and Golomb, *Energy and the Environment: Scientific and Technological Principles (2012)*

US EPA: [www.epa.gov/climatechange/](http://www.epa.gov/climatechange/) including links related to various climate and energy related topics

International Energy Agency (IEA): [www.iea.org/](http://www.iea.org/) *World Energy Outlook 2014*

US Energy Information Administration (EIA): <http://www.eia.gov/> including links to information regarding various energy resources and technologies

Gore, Al: *The Future: Six Drivers of Global Change* (2013)

McKibbin, Bill: *The Global Warming Reader: A Century of Writing about Climate Change* (2012)

Other sources will be discovered as the class progresses.

**The Mysterious Future** Part of the course will involve exploration and discussion of topical issues. Because I cannot know what issues will be in the news in October or November, I cannot set a complete agenda at this time. Whatever it is, let's just hope it is not too scary.

### **Deliverables (Presentations and papers)**

**Energy Resource Paper** You will prepare two formal written reports. The first paper (7-10 text pages, double-spaced), prepared by each "resource group" during Part 2, will be a description and analysis of its assigned energy source. Each group must include their assessment of the practical feasibility of the technology as a possible contributor to our energy future. Each "resource group" will prepare and present a succinct 20 minute PowerPoint or Prezi **Energy Presentation** on their specific energy resource or technology. The presentation will be followed by a class discussion of how this resource might fit into the world energy picture.

**Critical review of a media source** You will give an 8-10 minute presentation reviewing a book, long article, documentary film, or other long form non-fiction media source. This review will allow you to use the knowledge gained in the previous weeks to critically assess the document. This is not an illustrated talk, but you may use a marker and whiteboard as needed.

**Summary Term Paper** Your second, individual, paper (10-12 text pages; double-spaced) will consist of your analysis of the overall state of the climate issue, the potential technical means to address this issue, and the policies you recommend to facilitate or implement your recommendations. Alternatively, you may use this time to argue that no action is needed. In either case you will need to defend your assertions.

### **Grades for the Course**

**Grading** will be based on...

1. **Attendance and participation**, as assessed by the instructor, will account for 25% of your grade. See notes under **Class Components** for details.

2. The **mid-term exam** and on-line quizzes will count for 20% of your grade (10% each).

3. The Part 2 **and**: Grading of the **energy resources paper** will be based on accuracy, organization, clarity of writing, and references and will account for 10% of your grade. The PPT/Prezi **presentation** will be assessed on accuracy, clarity, quality of illustrations, delivery, and ability handle questions, and will account for 10% of your grade.

4. The Part 3 **critical review presentation** will count for 15% of your grade. Assessment of your oral presentation will be based on accuracy, organization, cohesiveness, and delivery.

5. Grading for the **term paper** will be based on accuracy, organization, cohesiveness of argument, clarity of writing, and references, and will count for 20% of your grade.

Final letter grades will be assigned on a percentage basis: 100-90% = A to A-, 89-80% = B+ to B-, etc. A mid-term unsatisfactory grade ("U" grade) will be assigned to students with grades projected to be at the D level or below. "U" grades will not appear on your final UMW transcript.

**Note: The Office of Disability Services** has been designated by the University as the primary office to guide, counsel, and assist students with disabilities. If you receive services through that office and require accommodations for this class, please make an appointment with me as soon as possible to discuss your approved accommodation needs. If you need accommodations (e.g. note taking assistance, extended time for tests, etc.), contact the Office of Disability Services at 540-654-1266.

**Schedule (subject to revision throughout the semester)**

**Part 1 Greenhouse gases and the science of climate change**

### Week 1

T: Introduction to the class; review of syllabus; an overview of the controversy over climate change; what do fossil fuels have to do with it?

R: R: Visit to library for an introduction to modern literature research methods

### Week 2

T: Basic science of global climate change: How do greenhouse gases influence Earth's atmosphere? My one and only lecture! Readings: class notes and other assigned material.

R: Historical perspective on greenhouse gases and climate change; Readings: class notes; Arrhenius, "On the Influence of carbonic acid..." (1896); G.S. Callendar, "The artificial production of carbon dioxide..." (1938); Revelle and Suess, "Carbon dioxide exchange between..." (1957)

### Week 3

T: Additional perspectives on greenhouse gases and climate; Readings: IPCC: *Climate Change 2013: The Physical Science Basis*; selected topics from [www.epa.gov/climatechange/science/](http://www.epa.gov/climatechange/science/)

R: What else besides gases can affect climate? Milankovich cycles, volcanism and Snowball Earth. Readings TBD

### Week 4

T: What is the bottom line here? Is this real or what? Readings: IPCC: *Climate Change 2014: Synthesis Report, the Summary for Policy Makers; dissenting opinions TBD*

R: Midterm exam on the science of climate change

### **Part 2: Renewables to the rescue! (maybe)**

#### Week 5

T: Introduction to renewable energy. Readings TBD

R: *Solar Energy Group* presentation and discussion; Readings provided in advance by the group

#### Week 6:

T: *Wind Energy Group* presentation and discussion; Readings provided in advance by the group

R: *Biomass Energy Group* presentation and discussion; Readings provided in advance by the group

#### Week 7

T: *Nuclear Energy Group* presentation and discussion; Readings provided in advance by the group

R: *Hydrogen Fusion Group* presentation and discussion; Readings provided in advance by the group

#### Week 8

T: *Fall Break*

R: Wrap up discussion of energy sources. What did we miss?: Alternative alternatives.

### **Part 3: The media and political response**

#### Week 9

T: Introduction to policy initiatives designed to address climate change; Readings TBA

R: Can fossil fuels be made clean and green? What about carbon capture and other ideas?

#### Week 10

T: Using the tax system: incentives for renewables; other incentives and programs

R: Using the tax system: disincentives for fossil fuels; environmental regulations; a tax on carbon emissions

#### Week 11

T: Introduction to media coverage of global climate change; begin viewing and discussion of the film, *An Inconvenient Truth* (or other film)

R: Complete viewing and discussion of film; Fact checking

#### Week 12

T: Additional review and discussion of *current* media; Readings TBA

R: Additional review and discussion of *current* media; Readings TBA

#### Week 13

T: Critical review of media *presentations*; Q&A and discussion

R: Critical review of media *presentations*; Q&A and discussion

Week 14

T: Critical review of media *presentations*; Q&A and discussion

R: Holiday Break

Week 15

T: Critical review of media *presentations*; Q&A and discussion

R: Class wrap-up