**SUS 325 Energy Systems and Sustainability**

**Synonym Number: 95076**

**Spring 2016**

**3 credits**



**I. Course Information:**

*Meeting Time and Day:* Tuesdays 1:00-3:50 PM *Class Location:* Academic Building, 215

*Start Date:* 01/19/16 *End Date:* 05/06/16

*Refund Date:* 02/03/16 *Withdraw Date:* 04/10/16

# *Prerequisites:* SUS 300 or SUS 301, minimum grade of C-.

# If you have not yet taken one of these courses, one of them

# must be taken concurrently with this course.

**Instructor Information**:

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*Office: Bristol Hall 109 (enter through room 111)*

*Office Hours: Mon.: 10:00-12:00 AM and 1:00-4:00 PM; also by appointment*

1. **Course Description:** Examines depletion of fossil fuels in the context of the global growth economy. Also examines social and ecological effects of fossil fuel extraction and use and the geopolitical context of energy resource competition. Focuses heavily on economic, technological, social, political, and cultural avenues for innovation and change aimed at mitigating the problems fossil fuel use and depletion pose for individuals, groups, nations, and ecological systems.

Topical Outline

1. The first and second laws of thermodynamics.
2. Energy return on investment (net energy).
3. Fossil fuel supplies and production (oil, coal, natural gas).
4. The fossil fuel energy system.
5. Alternatives to fossil fuels (wind, solar, biomass, geothermal, hyro-electric, ocean thermal energy conversion, tides and waves, nuclear, etc.).
6. Energy policy.
7. Demand side energy management (conservation, curtailment, sustainable adaptations).
8. Energy production/use and the future of civilization.
9. **Student Learning Outcomes, Competencies, and Skills:** Upon completion of this course, you should:
10. Understand energy as a property (the ability to do work) and energy conversion in terms of the first two laws of thermodynamics (the conservation law and the law of entropy).
11. Understand the concept of energy return on energy invested (net energy) as a crucial consideration in energy planning and policy.
12. Understand significant ecological, technical, economic, and political possibilities and challenges relevant to transitioning global energy systems away from fossil fuels.
13. Understand social and ecological justice implications of energy choices.
14. Understand a variety of geopolitical tensions that exist worldwide with regard to energy resources and energy consumption.
15. Understand the central issues and points articulated by the Intergovernmental Panel on Climate Change with regard to the socio-ecological implications of climate change.
16. Articulate a rationale and strategies for transitioning away from the fossil-fuel-based energy system.
17. **IDEA Objectives:** In addition to the above learning outcomes, you can be expected to achieve the following competencies—provided that you participate fully in the course and complete all requirements:

Objective #3: Learning to apply course material to improve thinking, problem solving, and decisions.

Objective #10: Developing a clearer understanding of, and commitment to, personal values.

Objective #11: Learning to analyze and critically evaluate ideas, arguments, and points of view.

Objective #12: Acquiring an interest in learning more by asking questions and seeking answers.

1. **Evaluation Methods and Class Management:** Your grade in this course will be determined by participation, online discussion of course material and concepts, analytical and reflective writing assignments, in-class group exercises and presentations, and an action project of your choosing. Class participation and involvement in face-to-face discussions and exercises are part of your grade. Participation consists of a variety of ways of engaging as well as being both present and aware during class. Your education depends on both your instructor’s creation of a learning environment and your engagement with the course experience. You are required to read the assigned readings **prior** to each class session and be prepared to discuss relevant ideas and concepts in class. Please try to avoid entering class late or leaving early because doing so disrupts the class. Here are some general guidelines to help you understand the structure of this course, the expectations I have of you, and what you can expect from me.
* We will be using the following online tool as primary means of communication:

Canvas (<https://coloradomtn.instructure.com/>) CMC’s chosen e-learning tool will provide an online site for our course. This is where you will find course announcements, assignments, and more. I will provide an overview of Canvas during the first week of class.

* All assigned papers must be turned in via Canvas, which means they must be word processed!
* Your CMC e-mail address is considered to be an official means of contacting you about this course. Therefore, you are expected to check your CMC e-mail regularly.
* I may choose to alter the course material as the semester progresses. These changes will be conveyed to you in class and reflected in Canvas. Any such changes will be finalized by the date they are assigned.
* I will accept late assignments for one week following the original due date. All late assignments will be docked one full grade (10%). No assignments will be accepted following our last class meeting on December 10, 2014.
* If you need to miss a class, please notify me as soon as you are aware of this to make arrangements to get the course material and make up any missed activities. Course attendance is part of your grade, and being in class will influence your level of success in this course since many of the assignments stem from course discussions.
* You create your path in this life, and building a meaningful and satisfying path takes effort. Information means nothing unless you take it in, consider it within the framework of what you already know, reflect upon it, and create your own interpretation and connections from this process. This course is designed to help you learn foundational knowledge about energy systems and their relationships to sustainability, but it is your own efforts in this process that matter the most. Stay current with course readings and other requirements, and come to class ready to engage in stimulating discussions with your classmates.
* A note on academic honesty: plagiarism is not acceptable in this class. Plagiarism occurs when you use someone else’s work, do not cite them for their work, and claim such work as your own. Plagiarism is considered academic misconduct and will be treated as such as defined in the “Academic Policies and Requirements” section of the *Colorado Mountain College Student Handbook*.

Grade % Quality Points

A 93.5%-100% 4.0

A- 89.5%-93.4% 3.7

B+ 86.5%-89.4% 3.3

B 82.5%-86.4% 3.0

B- 79.5%-82.4% 2.7

C+ 76.5%-79.4% 2.3

C 72.5%-76.4% 2.0

C- 69.5%-72.4% 1.7

D+ 66.5%-69.4% 1.3

D 62.5%-66.4% 1.0

D- 59.5%-62.4% 0.7

F below 59.5% 0.0

Final grades will be assessed as follows:

**General Class Participation 10%**

**In-class Group Exercises and Presentations 15%**

**Action Project 15%**

**Online Discussion Questions 15%**

**Sustainable Energy Systems Essay 20%**

**Final Analytical and Reflective Essay 25%**

 **Semester Total: 100%**

**General Class participation: 10% of final grade:** The success of this course—for you and for your classmates—depends largely on your commitment to attending, preparing for, and participating in class. Readings will be assigned for each class—do them! If you don't, you'll be lost in class, and class discussions will suffer markedly, impacting the learning of others as well. Also, since class participation is worth 10% of your final grade, your grade will suffer if you continually lag behind in or don't complete readings, if you skip classes, or if you neglect to participate. That said, you will not necessarily be graded on the *quantity* of your participation. Having a great amount of poor quality, uninformed participation is not beneficial to you or to the class and will not result in a high grade for participation. Readings assigned for a particular class are to be completed *prior* to that class. As one gauge of your class participation, I will take attendance regularly. If you have questions about your participation grade, please consult with me.

* *Addresses learning outcomes 1-7 and IDEA objectives 3, and 10-12.*

**In-class Group Exercises and Presentations: 15% of final grade:** Throughout the term, you will participate in a number of in-class activities and presentations that require you to analyze, evaluate, and apply ideas drawn from course readings. This work, other than the reading, will take place entirely within the class time. Therefore, you will need to be present to complete these collaborative assignments. Specific instructions will be given within the Canvas modules for this course. Attending the CMC Sustainability Conference and facilitating a session at the conference is also part of this graded portion of the course. **Please plan to attend the entire conference to be held at our campus the morning thorugh the evening of Thursday, April 21, and the morning through 2:30 of Friday, April 22 (Earth Day!).** Specifics on what you will do there and the session you will facilitate will be discussed in class. For now, just be sure you are available to attend the conference on these dates.

* *Addresses learning outcomes 1-7 and IDEA objectives 3, and 10-12.*

**Action Project, 15% of final grade:** You will choose an action project that applies some of what you learn through this course. Details will be provided in class. You may choose to work independently or as part of a team. Be sure that your chosen project provides you with an opportunity for critical reflection and learning tied to the content of this course. You will be called upon to make connections between course content and your action project.

* *Addresses learning outcomes 3 and 7 and IDEA outcomes 3, 10, and 12.*

**Online Discussion Questions, 15% of final grade:** You will be required to participate in online discussions based on course readings, assignments, and in-class conversations. You will use the Canvas courseware platform to engage in these discussions, and specific instructions on how to do so will be provided in class. You are encouraged, not only to post your own individual responses to the question(s) posed, but also to respond thoughtfully to your classmates’ and your professor’s posts and/or to ask questions relevant to the discussion. Although these discussions are somewhat informal in nature, please communicate clearly and thoughtfully using standard English grammar and sentence structure. Texting lingo, for example, is not acceptable for these writing assignments.

* *Addresses learning outcomes 3- 7 and IDEA objectives 3, and 10-12.*

**Sustainable Energy Systems Essay: 20% of final grade:** Several weeks into the term, you will be asked to write an essay that lays out your thoughts on how modern, industrial societies might transition their energy systems away from fossil fuels. This is a challenging essay that will offer you an initial opportunity to analyze and synthesize your learning in the course to date. Specific assignment instructions will be discussed in class and posted via Canvas.

* *Addresses learning outcomes 1-5 and 7 and IDEA outcomes 3 and 10-11.*

**Final Analytical and Reflective Essay: 25% of final grade:** Near the end of the term, you will write an in-depth analytical and reflective essay that will call upon you to synthesize course content, develop and support your own arguments about the current and future state of the energy system, and relate the content of the course to the context of your own learning and life. Instructions for this essay will be provided in class and via Canvas.

* *Addresses learning outcomes 3, 5, and 7 and IDEA outcomes 3, 10, and 11.*

**Extra Credit:** I may identify in class and/or via Canvas opportunities to earn extra credit. All such opportunities will be open to all students.

**Notice:** A student judged to have engaged in academic misconduct as defined in the “Academic Policies and Requirements” section of the *Colorado Mountain College Student Handbook* will, at a minimum, receive a “zero” for the work in question. The student may also be removed from the class, resulting in a failing grade. All student course material may be submitted to turnitin.com (or another anti-plagiarism program) at the instructor’s discretion. “Academic Expectations,” the “Student Code of Conduct and Judicial Process,” and more information about academic misconduct can be found in the *Student Handbook*.

Students are responsible for course materials from assigned text(s) and reading, lectures, labs, and other assignments as required. The instructor may alter any, or all, of this syllabus during the semester as the learning environment requires. Students will be notified in writing of changes. Attendance at all class meetings is expected.

1. **Attendance and No-show Reporting:** Attendance and early engagement are important elements for your success in this course. All students who do not attend the first class(es) or meet early attendance requirements must be reported by the instructor to the Registrar’s Office. Financial aid students who do not attend the first classes(es) or meet early attendance requirements will be dropped from the course and may not receive financial assistance ([**http://coloradomtn.edu/financial\_aid**](http://coloradomtn.edu/financial_aid)).
2. Students with Disabilities: If you have a disability protected by the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act and feel you may need classroom accommodations based on the impact of your disability, please contact the Disability Services Coordinator for our campus: Deb Farmer at 970-870-4450
3. Withdrawal from this Course: Students wishing to withdraw from this course must INITIATE the course withdrawal/drop

process at the site Registration Office. This class could be cancelled one week prior to the census date if a sufficient number of students are not enrolled by that date.

1. Grading System and Options:Information about grading is available in the Colorado Mountain College catalog. Grades will be posted to <https://webadvisor.coloradomtn.edu/> (WebAdvisor) by Thursday following the last day of classes at the end of each semester.

**IX.** **Required Course Materials:** The following texts are required for this course:

Pahl, Greg. *Power from the People: How to Organize, Finance, and Launch Local Energy Projects*. Santa Rosa, CA: Post Carbon Institute, 2012.

Additional course materials will be made available via the Internet or Canvas. This material will be listed in the weekly modules within Canvas. As the course progresses, I may alter the readings to better address/explore a topic/area of interest/concern. Any such changes will be reflected in Canvas at least one class period prior to the originally assigned date, and students will be notified during class of any such changes.

**Colorado Mountain College has chosen to partner with Follett Virtual Bookstores to operate textbook services.**

The official textbook list for CMC will be available on Follett's site, [www.coloradomtn.bkstr.com](http://www.coloradomtn.bkstr.com).  You also can easily access this site by choosing "bookstore" from the quick links on [www.coloradomtn.edu](http://www.coloradomtn.edu).  Students and other members of the campus community may sign up for the Online Textbook Store's email mailing list here [www.coloradomtn.bkstr.com/email](http://www.coloradomtn.bkstr.com/email) to receive important messages from the CMC Online Textbook Store. Students can sell back books anytime online or in-person at Follett's CMC buyback events.  Sign up for the online store's email list at [www.coloradomtn.bkstr.com/email](http://www.coloradomtn.bkstr.com/email) for more info on future buyback dates and times. If you have any online bookstore questions, you can email coloradomtn@fvb.follett.com or call 800-621-4088.

1. **Other Information:** A course outline/schedule is available in Canvas. This outline/schedule is tentative and many be modified during the semester as needed. You will be notified of any changes both via Canvas and in class.

**XI. Virtual Library Information:** [**http://coloradomtn.edu/library**](http://coloradomtn.edu/library)

The Virtual Library has its doors open 24/7, providing access to thousands of online journals and newspapers, e-books and art images, downloadable videos and audiobooks, career resources, and practice tests.

**Login Instructions**: Use the CMC Libraries link from Canvas course menu to access the CMC libraries web site. The link will pass authentication credentials to the server that will allow you to use online library collections. It will also take you directly to the libraries’ home page.

**Ask a Librarian**: If you need assistance with a research project, you can ask a librarian online. Select the AskAcademic chat box on the libraries’ home page, and type in your question. This service is available 21 hours a day, 7 days a week. You can also email reference@coloradomtn.edu or call the library staff at 800-621-8559, extension 2926.