**SUS 325 Energy Systems and Sustainability**

**Synonym Number: 17295**

**Spring 2019, 3 credits**

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**I. Course Information:**

*Meeting Time and Day:* Tuesdays 12:20-3:00 PM *Class Location:* Bristol Hall, 221

*Start Date:* 01/15/19 *End Date:* 05/03/19

*Refund Date:* 01/30/19 *Withdraw Date:* 04/06/19

# *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**:

*Name: Tina Evans*

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

*Office Hours: Mon. 1:00-3:30 PM, Wed. 2:30-3:30 PM, Thurs. 2:00-3:30 PM; also by appointment.*

1. Required Course Materials**:** CMC’s Steamboat Springs Campus participates in a flat rate access fee program for course materials so that 100% of students have all of the required textbooks the first day of class based on a library-like access model. All student textbooks and digital access codes will be provided beginning the start of the semester. Pick up textbooks at the Campus Store, Steamboat Academic Center, third floor.

The following texts are required for this course:

McLean, B. (2018). *Saudi America: The truth about fracking and how it’s changing the world*. New York, NY: Columbia Global Reports.

Pahl, G. (2012). *Power from the people: How to organize, finance, and launch local energy projects*. Santa Rosa, CA: Post Carbon Institute.

Scheer, H. (2010). *The energy imperative: 100 per cent renwable energy now*. New York: Earthscan.

A significant amount of additional course material 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.

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 general 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 complete the assigned readings **prior** to each class session and to 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.

* 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.
* We will be using Canvas as primary means of communication. Canvas is CMC’s chosen e-learning tool that provides an online site for our course. You will find course announcements, assignments, schedules, and more posted in our Canvas course site. I will provide an overview of Canvas during the first week of class.
* All written assignments, unless otherwise specified, must be turned in via Canvas, which means they must be word processed.
* Your CMC e-mail address is considered an official means of contacting you about this course. Therefore, you are expected to check your CMC e-mail regularly.
* I may modify or 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.
* Assignments may be submitted early if need be. 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 the last week of class.
* If you need to miss a class in order to participate in a CMC-sanctioned activity, due to health reasons, or due to an emergency situation, 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.
* Please do not expect me make course accommodations for you so that you may engage in personal travel (vacations, travel for concerts, etc.). If you choose to miss class for personal travel or other personal reasons such as work, you are expected to use Canvas to keep up with course readings and assignments. Do not expect me to review with you the material you missed in class. You also will not have an opportunity to make up in-class work or participation credit.

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% 100 points**

**In-class Exercises and Presentations 20% 200 points**

**CMC Sustainability Conference Participation 5% 50 points**

**Action Project 15% 150 points**

**Online Discussion Questions 10% 100 points**

**Sustainable Energy Systems Essay 20% 200 points**

**Final Analytical and Reflective Essay 20% 200 points**

**Semester Total: 100% 1000 points**

**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 makes up an important percentage 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. Class participation grades will be calculated at the end of the term and posted in Canvas. 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 Exercises and Presentations: 20% 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 on this work will be provided within the Canvas coruse modules.

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

**CMC Sustainability Conference Participation: 5% of final grade:** You will be required to attend the CMC Sustainability Conference to be held on April 18, 4:30-8:00, in and around the auditorium on campus. A written reflection on what you learn at the conference is also required. Details on the amount of required participation and on the written work you will submit will be provided in class.

* *Addresses 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. Because you will be called upon to make connections between course content and your action project, be sure that your chosen project provides you with an opportunity for critical reflection and learning tied to the content of this course.

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

**Online Discussion Questions, 10% 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 in which you articulate 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. 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: 20% 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 energy systems, 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 additional opportunities to earn extra credit. All such opportunities will be open to all students.

1. Information for You as a CMC Student: You have a right to know certain information that the College is required by law to provide. Links on this page ([**https://coloradomtn.edu/your-right-to-know**](https://coloradomtn.edu/your-right-to-know)) will connect you with helpful information including disability services, complaint processes, policies and procedures, textbook information, registration, attendance and grading, graduation rates and much more. Some specific information available online is also summarized below, along with other course-specific policies and procedures:
2. 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.
3. Students are responsible for course materials from assigned text(s) and reading, lectures, labs, and other assignments as required.
4. Attendance at all class meetings is expected.
5. 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.
6. Withdrawal from this Course: Students wishing to withdraw from this course must **initiate** the course withdrawal/drop process at the site Registration Office.
7. **Notice of Nondiscrimination**: Colorado Mountain College does not discriminate on the basis of age, color, disability, gender identity, marital status, national or ethnic origin, political affiliation, race, religion, sex (including pregnancy), sexual orientation, veteran status, and family and genetic information, or in its programs and activities, as required by Title IX of the Education Amendments of 1972, Title II of the Americans with Disabilities Act of 1990, as amended, Section 504 of the Rehabilitation Act of 1973, Titles VI and VII of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and as provided in other applicable statutes and College policies. The College prohibits sexual and gender-based harassment, including sexual assault, and other forms of interpersonal violence. To obtain more information regarding non-discrimination policies, visit [**http://coloradomtn.edu/about-cmc/notice-of-nondiscrimination/**](http://coloradomtn.edu/about-cmc/notice-of-nondiscrimination/) or contact Lisa Doak, Title IX Coordinator, [ldoak@coloradomtn.edu](mailto:ldoak@coloradomtn.edu), 970-947-8351, or Angela Wurtsmith, Director of Human Resources, [awurtsmith@coloradomtn.edu](mailto:awurtsmith@coloradomtn.edu), 970-947-8311.
8. Tentative Class Schedule: The Canvas course modules for this class comprise a tentative class schedule that may be modified during the term as necessary to foster student learning.
9. **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 your 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](mailto:reference@coloradomtn.edu) or call the library staff at 800-621-8559, extension 2926.

1. **Learning Lab:** A great resource for you is the CMC learning lab in Bristol 146. Scheduled **tutors** are available in most curricular areas, and tutoring services can be arranged one for additional subjects. The Learning Lab staff WANTS to help you! Visit their website for further information: <http://coloradomtn.edu/campuses/steamboat_springs/tutoring/> .
2. **Research and Writing Center (RAW):** The RAW is an excellent place for you to get help with research and writing. Professors at the RAW can help you at any stage of the research and writing process: idea generation, finding high quality sources, organizing your work, citing sources properly, and/or polishing your work. The RAW is located in the Library on the third floor of Bristol Hall. Ask about current hours there. You are strongly encouraged to use this resource for this class, and please don’t wait until the last minute to do so!