FYS 106-3: STEM From the Ground Up: The Thrills and Skills of Science, Fall 2018

Professor:

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Office Hours:

My ***office hours are Mon 1-2pm, W 1-3pm, and Th 1-2pm***. These are the times when my door is open and I am there for students to drop in and ask questions, no need to make an appointment during these times. I am also available by appointment and you are always welcome to just drop by to see if I am available. Office hours are a great chance to ask questions about homework and course content, discussions about absences, or any issues that require my undivided attention. Protocol and content questions are always welcome in class too!

Course Description and Goals:

This is a first-year seminar course designed exclusively for the students who are participating in Gettysburg College's STEM Scholar program (STEM = Science Technology Engineering and Mathematics). In this seminar STEM Scholars will learn what distinguishes science from other modes of inquiry, and will be introduced to skills used throughout various STEM disciplines. Through readings, analyses, discussions, and engaging activities, the STEM Scholars will learn what scientists do and how they do it, with special emphases on the importance of problem solving, quantitative skills, and clear communication with fellow scientists and the general public. Students will be introduced to the scientific conventions of experimental design, data acquisition, analysis, and uncertainty. We will also explore how basic scientific research informs technological applications used in our daily lives, learn about cutting-edge scientific discoveries across a variety of fields, and the ethical issues involved in the pursuit and application of science. Students will be asked to engage sources of scientific literature through critical reading, evaluation, discussion, and writing, and learn how to discern legitimate and vetted scientific content in a sea of information.

This seminar is part of the BURG program, which requires four classroom hours per week and partnership with a college administrator. In the BURG program faculty and administrators work together to develop high impact educational opportunities and facilitate discussions on the transition to college. Our BURG partner is Jamie Guilford from the Center for Career Engagement. Along with your STEM faculty, liaisons, and advisors, Ms. Guilford will be an invaluable resource for all of you as you navigate the relationship between your undergraduate education and your future career path.

This seminar will be taught by a rotating cadre of STEM faculty (a different professor every Fall semester) who all share in the vision and importance of the course goals. Each faculty member will bring his/her individual disciplinary lens and subject matter to the seminar emphasizing the common themes and tools of scientific pursuit regardless of the field of study. In addition, students will have the opportunity to experience guest speakers from on and off-campus, and will participate in a field trip to a regional museum or laboratory. This seminar will focus on common key aspects of science that provide a foundation for success in STEM at Gettysburg College and beyond. Finally, in addition to being part of the vision of the STEM scholarship program, this seminar fulfills the Science, Technology and Society (STS) requirement of the general Gettysburg College curricular goals.

STEM Scholars will benefit by:

- Demonstrating basic STEM literacy and best practices for student academic success.
- Developing proficiency in finding, reading, understanding, and evaluating science-related content. This includes primary sources of scientific literature as well as online databases, websites, and books for the general public.
- Learning information literacy techniques to enable them to properly explore and use the literature in a broad range of scientific disciplines
- Demonstrating the ability to communicate clearly, both orally and in writing, following the basic communication conventions of scientists.
- Learning to use various software applications such as Microsoft Office and statistical data analysis tools for basic classroom/lab use, reports, and presentations.
- Gaining an understanding of the important interdependent relationship between scientific research, technological development, and society.

Meeting Times:
MWF 9 – 9:50 am, Glatfelter 203, Th 11:30 am – 12:30 pm, Glatfelter 303

Remember that start times for class are firm. It is your responsibility to be on time and ready to go so that you don't miss important information and can participate fully.

Readings and Required Materials:

There is no required textbook for this seminar. Readings are drawn from a variety of resources including peer-reviewed journal articles, book chapters, magazines, and peer-reviewed national reports. All reading materials will be placed on the course Moodle site or on reserve at the library as necessary. Students are expected to come to class having completed the appropriate reading assignments for the day.

Information – Moodle, e-mail, and Class:
The Moodle system will be used to post course documents, readings, useful resources, PPT presentations, assignment details, quizzes/questionnaires, etc. I use the first few minutes of class before lecture for general course announcements so don't be late! I use campus e-mail to send announcements and course info intended for the entire class. If you have any Moodle or e-mail issues or questions please contact IT via the computing services Helpdesk. When doing activities in Moodle keep in mind that you must *SUBMIT* your work when you are finished, this is particularly true for timed quizzes, otherwise it may not register your attempt. You have been duly warned.

Expectations:
Be ready to engage and learn something new *every day*. You won't be able to do this if you're not prepared and on time. A typical college course requires 1-3 hours of work outside of class for every hour spent in class, keep this in mind throughout the semester. If you find yourself frustrated with the material and lost in class ask yourself if you're really putting in the requisite amount of time and targeted effort to succeed.

A full list of topics, assignments, quizzes, and readings can be found on the Moodle Site. This is a work in progress, and things that are italicized should be treated as tentative.

I strive to create a friendly classroom environment and I expect that we'll all be mutually respectful, courteous, supportive, and encouraging to each other. You should feel at ease here so please speak up and ask questions but also give your classmates a chance to participate; class time belongs to *everyone*.

Grading Scheme

Your final grade will be based on various assignments, course participation, two projects, and exams as described below. Each component of the final course grade is weighted as follows. Final letter grades are based on a standard scale.

Component:	**Weight**
Participation & Attendance	**10%**
Student Leadership Project	**15%**
Group Project, Presentation, and Report	**15%**
Homework Assignments & Quizzes	**25%**
Midterm Exam	**15%**
Final Exam	**20%**

Assignments & Participation:
Homework assignments consist of readings, reflections, Moodle quizzes/questionnaires, questions on SL assignments, presentations, projects, and participation in the many and varied activities in this course. You are expected to complete all assigned readings before the associated class period, as such all readings are marked for completion in the course Moodle site (hence you must access them via the course Moodle site to receive credit). Pay attention to due dates and the specifics of each assignment. Late assignments will not be accepted because they are designed to inform what we're doing in class. If you have any questions or issues then it is your responsibility to let me know as soon as possible. Be prepared, engaged, and ready to think on your feet in class (if you're not then you might as well not be there).

Student Leadership (SL) Projects:
Each student will be responsible for leading a discussion and analysis of a "cutting-edge" area of research within a specific scientific discipline of interest. Each student will lead, support and provide an up-to-date and scientifically accurate discussion of the topic and the potential impact of that research to humankind/society. This is a great opportunity to direct an educational conversation and take responsibility for sharing knowledge – you don't really know something until you have to teach it to someone else! Each topic will need to be approved by the professor beforehand, at which point the student leader will research the literature providing sources that inform their given topic. A short (~15 min) presentation will be given followed by discussion and questions. More information will be coming soon…

Group Projects, Presentations, and Reports:
Student teams (2-3 students) will collaborate on a semester-long project focusing on a particular scientific topic of their choosing. This topic must have the potential to revolutionize our current understanding of the natural world around us, and/or have the potential to provide a significant technological advancement that may change our society/economy/culture/lives. Although this is a group project, it is expected that each group member will gain the sufficient knowledge necessary throughout the semester to become our local "expert" in that particular topic. At the end of the semester, each of the group projects will be presented to the entire class during assigned time slots. All members of the team will be expected to contribute to the oral presentation, and there will be a short question-and-answer period after the presentation to provide the audience an opportunity to ask questions about that topic. The team is required to write a collaborative paper/report of their semester-long project aimed at the general educated but non-scientific public. There will be milestone development deadlines throughout the semester to keep you on track including topic submission/approval, bibliography/references, outline, assignment of sections to each team member, draft paper, writing center feedback, and final presentation and paper. The written paper is due at the time of the presentation, no exceptions. More details to come!

Exams:
Exams in this seminar will be comprehensive and are designed to assess your understanding of all the topics discussed up to that point in time. They can be qualitative or quantitative in nature. The midterm exam is tentatively scheduled for the week before Reading Days, but I reserve the right to change that as long as I give you two weeks notice. The final exam is on MONDAY DECEMBER 10th at 8:30 am. Make your travel plans accordingly.

Field Trip:
We have a field trip to the Smithsonian scheduled for October 27th. *NOTE: this is a Saturday!* All STEM Scholars are expected to attend, so put this date on your schedule *now* and let me know ASAP if there is going to be a conflict. This is a directed inquiry field trip with a reflection exercise to follow. Stay tuned for more details.

BURG Activities and Guest Speakers:
Every Thursday, and occasionally sprinkled throughout the semester, we have BURG activities and guest speakers. These are great learning opportunities designed just for you! You are expected to be present for all sessions of class, including BURG sessions, as they contribute to your participation credit and the learning goals of the course.

Absences:
Attendance in this course is not optional. You are expected to be present, on time, and fully aware for all class sessions. Look carefully at your schedule for the semester and be certain that there are no conflicts. If there are, now is the time to deal with them. The bottom line is do not miss class if you can help it. Professors understand that situations beyond our control do arise, in these *rare* cases it is your responsibility to contact me as soon as possible so that we can make arrangements to avoid grade penalty.

It should be clear that extracurricular activities (including travel to/from athletic contests) and work conflicts do not constitute a legitimate reason for absence. Conflicts with other courses rarely occur, but if this happens talk to me now or as soon as possible so all parties can plan accordingly. Also please note that family vacations and taking off early for (and coming back late from) break due to a ride schedule or plane reservation are not legitimate reasons for missing class. If you choose to miss class when the College is in session, it is your choice and your responsibility to accept the consequences of that decision.

Accommodation for Disabilities:
The Office of Academic Advising provides all students the opportunity to self-disclose any disabilities. Appropriate and timely disclosure is necessary to ensure reasonable accommodation and to provide you with an opportunity to reach the academic goals of this course. If you have a physical or learning disability you must contact the Office of Academic Advising and secure the appropriate documentation. You must also contact your professors in the first week of classes about this disclosure so that we can plan accordingly. Students with an IEAP (Individual Education Accommodation Plan) are reminded that it is the student's responsibility, and decision, to share this information with their professors.

Academic Misconduct and the Honor Code in Action:
You are held individually accountable for all work that you turn in for a grade. I encourage you to work out concepts and problem solving strategies with your fellow students but please be aware that "working together" can be very dodgy when it comes to academic misconduct. It is often confusing to students how one can engage in collaborative efforts in class and lab, yet still take responsibility for the work done. How do you know if the work you're handing in is your own? Here's a great test – put it away and try to re-do it with no help from anyone, only your text and class notes. If you cannot repeat what you did to complete the assignment from beginning to end then you probably didn't play a significant role in doing the work. Note that when doing collaborative work although you may be primarily responsible for part of the assignment, it does not excuse you from understanding the other aspects of the assignment. To be a significant part of a broader vision and you need to understand the context your work fits into.

On all assignments that you submit for a grade, you are expected to write out and sign the following version of the pledge: ***I affirm that I have upheld the highest principles of honesty and integrity in my academic work and have not witnessed a violation of the Honor Code.*** Note that writing out and signing the statement of academic honor is not necessarily a requirement of our honor system. Rest assured that the code is always implied and enforced with all coursework that counts toward your grade. You can find information regarding academic misconduct and the honor code at the following link on the College website - http://www.gettysburg.edu/about/offices/provost/advising/honor_code/index.dot.

Our mission at this college reaches beyond your performance in this course. As a community we take breaches of honesty and integrity very seriously. Penalties for violating the Honor Code are stiff, particularly for students who don't take responsibility for their actions. If you are at all unsure of what constitutes academic dishonesty in this course, or you find yourself, or witness someone else, in a situation that you suspect falls into this category please let me know in person or via e-mail.