COURSE SYLLABUS

Direct Study: Current Topics in Scientific Teaching
STO 692, 1 credit
Spring 2019

Meeting times: Wed 3:30-4:30
Meeting place: Irving I rm 412
Prerequisites: Graduate standing in a science or engineering; STO 666 (Scientific Teaching) or STO 601 (Communicating Science) recommended

Instructor:
Dr. Christa Mulder, cpmulder@alaska.edu, Irving I rm 412, 474-7703.
Office hours: Monday 10:30-11:30 pm and Thursday 2-3 pm or by appointment

Course overview:
This independent study explores current trends in science education at the pre-college and college levels. Topics may include diversity, technology, active learning, and others. The course will rely on readings from the primary literature (research articles) and discussion.

This course is designed for students enrolled in the Graduate Certificate in Science Teaching and Outreach, and it is therefore expected that students will either be actively engaged in teaching science at some level, or plan to do so in the near future. Therefore, topics selected will be driven in part by students’ interests.

Course goals:
Most scientists are very familiar with the scientific literature in their own field of research endeavor, but few are aware of the large literature that exists on best practices in teaching science. Yet many of the questions that science teachers face daily (e.g., “Should I give out notes prior to class?” “What should the composition of project groups be based on?”) have been addressed by science educators. The primary goal of this course is to familiarize students with this literature so that they will be able to take advantage of information produced by studies in science education to improve their own teaching. A second goal is to make students aware of major national and international trends in science education. These goals will be achieved by reading and discussing science education literature, particularly topics of direct relevance to students’ own experiences or interests in teaching.

Upon completion of the course, students will be able to do the following:
1) Describe current trends in science teaching and their relevance to their own teaching goals
2) Discuss approaches to classroom teaching issues such as diversity (including background, education, and gender), use of active learning techniques, use of new technologies, and trends in formative and summative assessment, and how they apply to their own current or intended teaching activities
3) Examine, observe, analyze, and reflect on current trends in the literature
4) Effectively lead a group discussion

Course structure:
This course will use readings from the primary literature (research articles) to explore current trends in science teaching. Students are expected to read 2-4 articles per week on a given topic. The student and instructor will alternate selection of topics and articles. Participation in discussion is critical and will comprise a large percentage of the final grade. The student and faculty member will meet for approximately one hour to discuss the topics. Where appropriate, participation in a larger group
discussion on teaching in the science (an informal group) can be substituted for the meeting of the student with the instructor.

*Topics:* Topics will be selected alternating between the student and the instructor. Examples of topics from previous years include: Experiential learning, Diversity in group learning, Illustrations in Science education, Flipped classrooms, Metacognition, Assessment of science learning, Traditional Ecological Knowledge in science education, Teaching to underrepresented students, Reflective journals, Asking questions.

*Readings:* There is no textbook for the course. Readings will be drawn from the primary literature and/or book chapters. A full list is not provided, because many topics and readings will be student-selected. Journals from which readings will be drawn will include ones from the natural sciences (e.g., *BioScience, Ecology and Society*) social sciences (e.g., *Organizational Behavior and Human Decision Processes, Judgment and Decision Making, Journal of Personality and Social Psychology, Journal of Applied Psychology*), and science education fields (e.g, *Educational Research, Science Education, International Education Studies*), but any article that addresses the topic may be used.

*Leading Discussions:* The discussion leader (alternating between student and instructor) will select 2-4 articles focused on a topic of his or her choice. The discussion leader is expected to read additional articles to gain a broader understanding of the topic. Articles (or links to them) will be emailed a week in advance. The student will also supply a set of Reading Notes that lay out the rationale behind the selections, which readings are required, a recommended order for reading the articles, how the articles are related to each other etc. These Reading Notes may be updated (clearly labeled, e.g., “version 2”) as more literature is discovered between the day the first version is posted and class time (or later).

*Grading*  
Grading is pass/fail. A “pass” requires full preparation and active participation or leading of at least 90% of the discussions.

*Plagiarism/Academic Honesty:* Disciplinary action may be initiated in cases of plagiarism, cheating, and/or academic dishonesty. This includes providing false information in order to obtain an excused absence. Dishonesty will result in a failing grade. Please refer to the student code of conduct: http://www.uaf.edu/catalog/current/academics/regs3.html#Student_Rights

*Student Support:* Students with special needs or concerns can contact Student Support Services (474-6844). Please let us know at the beginning of the semester if you will require accommodations due to a documented disability, and we will work with you in conjunction with the Office of Disability Services (203 WHIT, 474-7043).

*Non-Discrimination Policy:* The University of Alaska Board of Regents have clearly stated in BOR policy that discrimination, harassment, and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment, including sexual harassment/misconduct/assault, you are encouraged to report that behavior. If you disclose sexual harassment or sexual violence to faculty members or university employees, they must notify the UAF Title IX coordinator about the basic facts of the incident. Your choices for disclosure include: 1. You may confidentially disclose and access confidential counseling by contacting the UAF Health and Counseling Center at 474-7043. 2. You can get support and file a Title IX report by contacting the Title IX coordinator at 474-7599. 3. You may file a criminal complaint by contacting the UAF Police Department at 474-7721.