CRSN 15A
STEM Essentials – Summer 2020

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Objectives
The goal of this course is to introduce tips and techniques that will supplement and expand your existing repertoire of science/math problem-solving skills. The material covered here will complement your other science and math classes, helping to maximize your performance in those courses and, more importantly, aid in your development as a confident learner and future expert in your subject.

You will learn the science behind how the brain learns and how you can design your study habits to take advantage of that. You will also develop and practice effective strategies for solving science and math problems. All of this will be embedded within a focus on metacognition, a fancy word that essentially describes how you actively monitor the progress of learning. It involves steps like planning your study approach, monitoring the effectiveness during the process, reflecting on and evaluating the success of the strategies that were used, and adopting a “growth mindset” to provide a positive outlook on learning, to put both failure and success in context.

Becoming an expert in your chosen subject area takes experience and practice, which won’t end at the conclusion of this course or even when you graduate. This course will boost your learning skills, helping you get the most out of your college education and laying the groundwork for success as a life-long learner.

Expectations
We aim to keep the workload as light as possible, while still providing sufficient depth to maximize your skill development. Each week there are short video lectures, online discussions, individual homework assignments, group activities and short quizzes. All we ask is that you be engaged in the material and put in a sincere effort during your participation in class and thoughtfully and carefully complete all homework assignments. The time spent on all class activities should average ~ 12-hours per week but may be more or less in some weeks depending on the topic. This is based on the required time investment to get an A in a 2-unit class – for a 10-week normal quarter course this would be 6 hours, but a 5-week summer session is double the pace – so 12 hours of work will sometimes be needed (including lectures and all assignments).

Grading
Grades will be primarily based on group activities and homework assignments. Weekly discussion participation will account for 10% of grade, homework assignment (including individual work and group work) completion 60%, pre- quizzes on weekly readings and the previous week’s topic 5%, participation in group activities (anonymously evaluated by peers) 10%, and the completion of a small series of research writing assignments 15%. There will not be a final exam or any midterm exams.
Learning Outcomes

By successfully completing this course students will be able to:

1) Understand the concept of distributed practice and exhibit how to schedule their study time to maximize distributed learning in their studying

2) Know what learning resources are available for use in their STEM classes. These may include learning support services such as group and individual tutoring, writing resources, academic advisors and career centers

3) Demonstrate an understanding of study techniques that research has demonstrated to be most effective, and those that are time consuming and less effective

4) Successfully find, read and utilize scientific literature

5) Write scientific papers applying appropriate attribution for information within

6) Creatively solve complex scientific and mathematical problems

7) Effectively and regularly evaluate their learning strategies and make revisions as needed

Course materials:

Microsoft Office – can be downloaded free on the UCSC website https://its.ucsc.edu/software/office365.html
No textbook required.

Dropping Courses in Summer Session

- YOU must officially drop your course by the **deadline** to avoid receiving an F or NP (No Pass) and being responsible for tuition and fees.
- There are no automatic drops over summer
  - Even if you never attend class - you need to drop yourself
  - Even if you don't pay - you need to drop yourself
  - If you are eligible for UC Financial Aid but decline it, you must still DROP your classes to avoid paying for them.
- Instructors do not drop students in summer. There is no "Administrative Drop by Instructor" in summer; the deadline is firm.
- The Summer Session Staff cannot drop you from your classes either.
- You must drop them using your Student Portal (my.ucsc.edu).

Failure to drop your course will result in billing you full tuition and fees.

- If you drop a course, a **refund** can be given based on the date on which the course is dropped, if you meet the deadlines.
  - There is no "Add by Petition" in summer. You must enroll by the deadline below.
  - There is no "Administrative Drop" in the summer. You must drop yourself by the deadline below.
  - The University administration is closed Friday, July 3, 2020, in observance of the July 4 Independence Day holiday (no classes).

**Session 1**
June 22 - July 24, 2020

**Deadlines**
- **Add** - Thursday, June 25
- **Drop** - Monday, June 29 (tuition reversed)
- **Financial Aid Disbursement** - Monday, June 15 (if enrolled by June 1 priority deadline)
- **Request "W" Grade** - Friday, July 10 (no tuition reversal)

**Session 2**
July 27 - August 28, 2020

**Deadlines**
- **Add** - Thursday, July 30
- **Drop** - Monday, August 3 (tuition reversed)
- **Financial Aid Disbursement** - Monday, July 20 (if enrolled by June 1 priority deadline)
- **Request "W" Grade** - Friday, August 14 (no tuition reversal)
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<tr>
<th>Week</th>
<th>Topic and activities</th>
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| **Week 1** | **Topic**: Thriving in STEM  
In this class you will learn about metacognition as a foundation for all of the concepts that will be discussed in this class.  
**Group activity**: Create a group action plan addressing the top 5 challenges STEM students face.  
Pre-reading: [https://www.purdueglobal.edu/blog/student-life/time-management-busy-college-students/](https://www.purdueglobal.edu/blog/student-life/time-management-busy-college-students/)  
**Topic**: time management and utilizing available learning resources  
In this class you will learn about effective time management skills, resources available on your campus and create a plan.  
**Group activity**: Discuss effective strategies for weekly time management and avoiding procrastination. Create your own weekly calendar. As a group, research resources available on your campus and create a plan to best utilize those resources. |
**Topic**: evidence-based study techniques  
In this class you will learn effective ways of learning and retaining material for your STEM classes.  
**Group activity**: work with your group to design practice test questions from the set of notes provided. These should include questions that differ in complexity and difficulty.  
Pre-reading: Carol Dweck *Mindset the new psychology of success* chapters 1 & 2  
**Topic**: growth mindset  
In this class we will focus on developing a growth mindset to excel in academics and beyond.  
**Group activity**: as a group complete the Student mindset assessment provided by your instructor. From the prompts prepare an example of how one could react with: a) a fixed mindset that might potentially create barriers to overcoming this obstacle and b) a growth mindset reaction that might facilitate learning from the experience. |
| **Week 3** | **Pre-reading**: [Feedback as a learning experience](http://greatergood.berkeley.edu/article/item/how_to_help_kids_overcome_fear_of_failure)  
**Topic**: STEM skills I: problem solving  
In this class you will sharpen your problem-solving toolkit and learn skills to methodically tackle complicated math problems.  
**Group activity**: work with your group to create a problem-solving guide.  
Pre-reading: [http://www.wiu.edu/advising/docs/mastering_test_taking.pdf](http://www.wiu.edu/advising/docs/mastering_test_taking.pdf)  
**Topic**: test taking and academic integrity  
In this class you will learn skills to become a confident, methodical and strategic test taker. You will also learn how to avoid accidentally committing plagiarism in scientific writing.  
**Group activity**: As a group evaluate three examples of plagiarism and report on how you determined what happened and how it could have been avoided. |
| **Week 4** | **Pre-reading**: [http://www.owlnet.rice.edu/~cainproj/courses/HowToReadSciArticle.pdf](http://www.owlnet.rice.edu/~cainproj/courses/HowToReadSciArticle.pdf)  
**Topic**: STEM skills II: source evaluation  
In this class you will learn useful skills to navigate the primary scientific literature and evaluate news media sources for credibility.  
**Group activity**: work with your group to analyze and categorize 3 scientific papers.  
**Topic**: STEM skills III: STEM research and writing  
In this class you will learn to critically review STEM writing.  
**Group activity**: After reading and reviewing your peer’s writing, you will provide each other verbal feedback on their STEM writing. |
| **Week 5** | **Pre-viewing**: Discipline and keeping to goals ([https://www.youtube.com/watch?v=PPQhj6ktYSO](https://www.youtube.com/watch?v=PPQhj6ktYSO))  
**Topic**: STEM skills IV: data presentation  
In this two-part section you will learn to create simple graphs in Excel, critically evaluate existing graphs and determine when they may be misleading.  
**Group activity**: create a group assessment of the three confusing graphs.  
**Topic**: long term goal setting and sustainable strategies for achievement  
In this class we will review the concepts learned in this class and establish realistic but challenging short-term and long-term goals.  
**Group activity**: discuss the top 5 approaches that you might take to stick to your long-term goals. As a group, create a long-term goals action plan that applies to STEM students. |
DRC Accommodations:

The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations or any other disability-related matter, please contact the DRC office, located in Hahn 125 or at 831-459-2089 or drc@ucsc.edu. Non UCSC students are encouraged to contact their home campus disability resource center for more information.

CARE

UCSC offers the CARE program to provide support, advocacy, resources and violence prevention education to the UC Santa Cruz community. We respond to the needs of students, staff, faculty and non-affiliates impacted by stalking, dating/domestic violence and sexual assault by providing free and confidential services. For more information: https://care.ucsc.edu/who-we-are/about-care.html Non UCSC students are encouraged to contact their home campus resource center to find out more about services on their campus.

Academic Dishonesty

Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC.

In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student’s transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the Academic Integrity page at the Division of Undergraduate Education. For information on correct citations please follow APA guidelines in this class. More information can be found at: http://guides.libraries.psu.edu/apaquickguide/articles

Title IX

The university cherishes the free and open exchange of ideas and enlargement of knowledge. To maintain this freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the university community who exercise most authority and leadership: faculty, managers, and supervisors.

The university has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. Information about the Title IX Office, the online reporting link, applicable campus resources, reporting responsibilities, the UC Policy on Sexual Violence and Sexual Harassment and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment can be found at titleix.ucsc.edu.

The Title IX/Sexual Harassment Office is located at 105 Kerr Hall. In addition to the online reporting option, you can contact the Title IX Office by calling 831-459-2462.