CRSN 15: Strategies to jump-start your STEM Learning

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. 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 from UCSC. This course will boost your learning skills, helping you get the most out of your UCSC education and laying the groundwork for success as a life-long learner.

Expectations
The course is designed for a relatively light workload—two hours of class time, four hours of reading and writing, while still providing sufficient depth to maximize skill development. There will be a short reading for most weeks; you should read the article before we meet and consider how the content relates to your experience or could be applied in your other courses. We will spend the first minutes of class discussing the reading. The rest of the meeting will be devoted to hands-on practice. All I ask is that you be engaged in the material and put in a sincere effort during your in-class participation.

Course learning objectives
1. Students will understand how their brains learn and how to design study habits to take advantage of that.
2. Students will develop and practice effective strategies for solving science and math problems.
3. Students will learn time management skills and how to study effectively.
4. Students will learn basic critical reading and writing skills.

Grading
Grades will be primarily based on in-class participation. Each class meeting will be worth 10 points for a total of 100 points. In class-participation and attendance will account for 60% of your grade (20% attendance and 40% participation) and homework assignments will account for the remaining 40%. Your final grade will be based on your work portfolio.

Academic Support
Learning Support Services: http://lss.ucsc.edu/
Modified Supplemental Instruction: http://lss.ucsc.edu/programs/modified-supplemental-instruction/index.html
Academic Excellence: http://ace.ucsc.edu/

Schedule and Activities
**Attendance is required and where you will earn most of your grade. If you must miss a class, you need prior instructor approval and will need to meet outside class time to make up for what is missed.**
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<th>Date</th>
<th>Activities</th>
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| **Week 1** | Meeting 1. Welcome; reflection on strengths and challenges  
Pre-reading: Cognitive theories of learning ([http://college.usatoday.com/2015/06/19/5-way-your-brain-learns](http://college.usatoday.com/2015/06/19/5-way-your-brain-learns))  
Meeting 2. Activity on setting academic and personal goals; discussion of academic resources |
| **Week 2** | Meeting 1. Time management, **bring each class syllabus and your organizer**  
Meeting 2. Organization for successful learning  
**Pre-reading:** Neuroscience and how learning works ([https://www.edutopia.org/neuroscience-brain-based-learning-neuroplasticity](https://www.edutopia.org/neuroscience-brain-based-learning-neuroplasticity)) |
| **Week 3** | Meeting 1. Optimizing your learning skills  
Meeting 2. Note taking strategies and activity  
| **Week 4** | Meeting 1. Study techniques practice 1  
Meeting 2. Study techniques practice 2  
**Pre-reading:** Evidence-based study methods pt 2 ([http://journals.sagepub.com/doi/pdf/10.1177/1745691616645770](http://journals.sagepub.com/doi/pdf/10.1177/1745691616645770)) |
| **Week 5** | Meeting 1. Learning from mistakes activity  
Meeting 2. Growth mindset discussion and applicability  
**Pre-reading:** Growth mindset and learning from mistakes ([https://www.edutopia.org/blog/teaching-students-to-embrace-mistakes-hunter-maats-katie-obrien](https://www.edutopia.org/blog/teaching-students-to-embrace-mistakes-hunter-maats-katie-obrien)) |
| **Week 6** | Meeting 1. Problem solving practice, including graphs  
Meeting 2. Test taking skills and strategies  
**Pre-reading:** Test taking tips ([https://pennstatelearning.psu.edu/test-taking-tips](https://pennstatelearning.psu.edu/test-taking-tips)) |
| **Week 7** | Meeting 1. Recognizing your strengths and challenges  
Meeting 2. Developing your own academic and professional identity  
**Pre-reading:** Feedback as a learning experience ([http://greatergood.berkeley.edu/article/item/how_to_help_kids_overcome_fear_of_failure](http://greatergood.berkeley.edu/article/item/how_to_help_kids_overcome_fear_of_failure)) |
| **Week 8** | Meeting 1. Critical reading and writing  
Meeting 2. Scientific/Technical reading and writing  
**Pre-reading:** Scientific reading skills ([http://files.eric.ed.gov/fulltext/EJ1058676.pdf](http://files.eric.ed.gov/fulltext/EJ1058676.pdf)) |
| **Week 9** | Meeting 1. Designing effective study group strategies  
Meeting 2. Study group activity  
**Pre-reading:** Memory and recall ([http://com.msu.edu/Students/Academic_Guidance/long_term_retention_recall.pdf](http://com.msu.edu/Students/Academic_Guidance/long_term_retention_recall.pdf)) |
| **Week 10** | Meeting 1. Long term goal setting and sustainable strategies for achievement  
Meeting 2. Reflection on achievements, set future goals  
**Pre-viewing:** Self-control and keeping to goals ([https://www.youtube.com/watch?v=PPQhj6ktYS0](https://www.youtube.com/watch?v=PPQhj6ktYS0)) |