CRSN 15 - Spring 2018

Strategies to jump start your STEM learning

Professor: Stella Hein
Email: stellahein@ucsc.edu
Office hours: Thursday 4:00-5:00, Rachel Carson 128A

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 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

We aim to keep the workload as light as possible, while still providing sufficient depth to maximize your skill development. There will be a short reading for most weeks; you should read the article before the class 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 developing and practicing your learning skills. 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 ~ 6 hours per week but may be more or less in some weeks depending on the topic.

Grading

Grades will be primarily based on participation in discussion and writing assignments. Attendance will count for ~15% of your grade, in class discussion/participation will account for ~30% of your grade and homework assignments will account for ~27% and a research paper with count for ~28%.

Schedule and Activities

Week	Activities
Week 1	INTRODUCTION; REFLECTION ON STRENGTHS AND CHALLENGES In this class you will learn about metacognition and reflect on your personal academic strengths and challenges.
Week 2	Pre-reading – reading from homework assignment (*Mindset* chapters 1 & 2) TIME MANAGEMENT In this class you will learn about effective time management skills and create a plan for success.
Week 3	Pre-reading: Evidence-based study methods http://journals.sagepub.com/doi/pdf/10.1177/1745691616645770 EVIDENCE-BASED STUDY TECHNIQUES In this class you will learn effective ways of learning and retaining material for your STEM classes.
Week 4	Pre-reading – reading from week 2 homework (*Mindset* chapters 1 & 2) GROWTH MINDSET In this class we will focus on developing a growth mindset to excel in academics and beyond.
Week 5	Pre-reading: Instructor will email class articles to read and review (as homework assigned week 4) SOURCE EVALUATION AND EVIDENCE BASED ARGUMENTS In this two-part section you will learn to critically evaluate evidence and make and review an argument.
Week 6	Pre-reading: Feedback as a learning experience (http://greatergood.berkeley.edu/article/item/how_to_help_kids_overcome_fear_of_failure) PROBLEM SOLVING In this class you will sharpen your problem solving toolkit and learn skills to methodically tackle complicated math problems.
Week 7	Pre-reading: TBA PRACTICAL DATA ORGANIZATION, EXCEL, AND FIGURES In this class you will learn useful skills to navigate Excel, make calculations, create graphs and more.
Week 8	REVIEWING AND CRITIQUING RESEARCH In this class you will learn to critically review STEM writing.
Week 9	TEST TAKING STRATEGIES In this class you will learn skills to become a confident, methodical and strategic test taker.
Week 10	Pre-viewing: Discipline and keeping to goals (https://www.youtube.com/watch?v=PPQhj6ktYSo) 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.

WEEK	TOPIC	HOMEWORK ASSIGNMENT	HOMEWORK DUE
Week 1	Introduction	1. Mindset chapters 1 & 2 2. Office hours 3. Complete online survey 4. Bring computer and syllabi	Due Sunday at midnight: **online survey**
Week 2	Time management	1. Calendars (weekly and term)	
Week 3	Evidence-based study methods	1. Time use log	Calendars (weekly and term) Mindset chapters 1 & 2
Week 4	Growth mindset	1. Source evaluation	Time use log
Week 5	Source evaluation and evidence based arguments	Research paper parts 1 (annotated bibliography) and 2 (research paper 1st draft)	Source evaluation
Week 6	Problem solving		Research paper part 1 (annotated bibliography for paper)
Week 7	Practical data organization, excel, and figures	1. Excel activity	
Week 8	Reviewing and critiquing research	1. Revise research paper	Research paper 1st draft Excel activity
Week 9	Test taking strategies	1. Long term goals + timeline	Revised research paper + peer reviewed 1st draft **Sunday at midnight:** **Long term goals + timeline**
Week 10	Long term goal setting and sustainable strategies for achievement	1. Complete online survey	Office hours log **Due Friday at midnight:** **Complete online survey**