



STEM & LEAF CORPS
— Innovation-Education-Service —

Special Topics Program

SPRING 2022 TOPICS

IMPORTANT: ALL LISTED MEETING TIMES ARE TENTATIVE AND MAY BE
CHANGED AT THE DISCRETION OF THE STUDENTS AND MENTORS!

Intro to Neuroscience

This topic will focus on neuroscience and devote time to understanding the nervous system, the brain, and psychology that is tied to neurobiology. Early on in this program we will be talking about the main structures of the brain and what each of the areas are called and their functions. Later, we will also be focusing on neuroscience psychology, also called cognitive neuroscience, which is defined as a more in-depth study that deals with how biological and chemical processes make the brain function and how the brain is intertwined with our behavior and mental processes. After that, we will move on to medical and psychological diseases and disorders of the brain. We will cover types of cancers and mental disorders involved in the brain and nervous

system. We will go on to discuss symptoms and potential solutions for these disorders and diseases.

Meeting time: Sunday at 6:30 PM CST

Creative Writing

Students will be exposed to fundamental writing styles, methods, techniques, structures, tropes, and character development of short stories and poetry. Students are encouraged to write on topics and subjects that interest them; no prompt will be provided unless requested. Every student will write a fiction piece, albeit a short story, poem, or novella, and, if they wish, present it to the group in order to receive helpful and constructive feedback. This program is designed to be a discussion and project rooted engagement, as students are expected to present original content.

Meeting time: Saturday at 6PM CST

Culture in Spanish Speaking Countries

This group will discuss culture in various Spanish-speaking countries around the world! We will explore countries that the students are interested in learning more about and dive into their history, interesting dialect anecdotes, popular food, music, dance, and current situation of the country. Group discussions will be conducted in English, and students of all backgrounds are invited to participate. Students with heritage from Spanish speaking countries are especially encouraged to join and share their experiences with the rest of us! Guest speakers from a variety of countries are a possibility based on the direction that the group would like to go. By the end of

the program, students will have completed a 2 page research paper on their country of choice that demonstrates their understanding of that culture.

Meeting time: Sunday at 6PM CST

Engineering Ethics and Philosophy

Engineering ethics is the field of moral principles that apply to the practice of engineering. The field examines and sets the obligations by engineers to society, to their clients, and to the profession. This semester, we will be covering topics such as: Artificial Intelligence (AI), Automated Vehicles, Environmental effects, and the large question of “Why do engineers need to be ethical?”. Once a week, we will hold discussions over assorted topics in this field and have an open conversation about morals, ethics, and philosophy.

Potential meeting times: Thursday at 12:00 pm or Tuesday at 4:00pm

Health Philosophy & Policy

Why is the debate between universal healthcare and private healthcare so contentious in the United States? Which philosophical ideals drive ideas from the left and right and why do they often seem in opposition? Where can we find bipartisan solutions? Can we find nonpartisan solutions for Americans? How does our tax code influence the choices that we make? How do we as citizens and corporations influence the tax code?

In the Health Philosophy & Policy topic we will explore these questions from a philosophical base and then reach for the concrete policy that actually affects health in America. Learn how to

read *and write* the U.S. tax code that influences millions of people's lives and health from a Congressional Intern who wrote bills that were sent to the Legislative Counsel of the U.S. House of Representatives.

Meeting time: Sunday at 7PM

Animal Husbandry & Modern Issues in Agriculture

The focus of this group will be on issues within the agricultural industry, such as sustainability and animal husbandry issues. We will dive into some discussion about how the pandemic has affected the agriculture industry, as well as how technology is changing things (ie regarding plant based "meat" and using robots to care for animals such as automated milking stations).

Meeting time: Tuesday at 5:30 PM

Introduction to Cancer Biology

Weekly 1.5 hour meetings and additional meetings if necessary

A recent publication by the American Cancer Society estimates that there will be around 1.9 million new cancer diagnoses in the U.S. in 2021 alone. Although advances in biomedical research and adoption of preventative public health measures have made substantial contributions in our efforts to combat cancer, the disease remains a leading cause of death contributing to nearly 10 million global fatalities in 2020. In this special topic we will examine the biological mechanisms of cancer development and progression, current approaches to prevention and treatment, and connections that can be made to other human illnesses. In

addition, we will learn about established and novel laboratory techniques used in cancer research and apply our understanding to solve real or hypothetical problems that may occur in the lab. Students will be asked to read articles from scientific journals, discuss research findings, and ultimately use learned information to craft one or more literature review(s) that will be submitted for publication. This special topics group is co-mentored by three graduate and one medical student with diverse interests and expertise in areas including membrane transporters and their affinity for cancer drugs, the tumor microenvironment in hypoxic conditions, regulation and regulatory activity of noncoding RNAs, and the systemic effects of immunotherapeutic and chemotherapeutic agents in patients. Through this program we aim to create an engaging, thought-provoking, and collaborative environment where questions are encouraged and learning occurs across disciplinary boundaries.

As this will be a challenging subject to explore and understand, it is highly recommended that students who apply have taken or are enrolled in a college-level biology or chemistry course (AP Biology/AP Chemistry), are able to actively participate in 1.5 hour weekly meetings, and have some interest in scientific research, teaching, or health-related professions. Additional meetings may be scheduled as necessary and the program is expected to run until the end of the winter holidays.

Meeting time: Saturday evenings