

CSIE Program Seminar Descriptions

1. CSIE 177: Cyanobacteria in Ford Lake/ Huron River Watershed

The focus of the course is an Academic Service-Learning project to characterize the genotype, and conditions for growth of potentially harmful cyanobacteria in Southeast Michigan waterways. Students develop original research projects and hypotheses, discuss methodology with biology and chemistry faculty, analyze samples in the biology and chemistry laboratories (BIOL 110/CHEM 122), interpret data, and prepare oral and written reports of their data and conclusions. Academic and professional development of students will be stressed within the context of public health issues. The connections between biological and chemical disciplines emphasized through student cohort participation in the CSIE course and the companion lecture and laboratory coursework in biology and chemistry.

Includes CHEM 121-General Chemistry I, CHEM 122-General Chemistry I Lab & BIOL 110-Introductory Biology I.

2. CSIE 177: Routing and Cost Analysis for Meals on Wheels

As part of the CSIE experiences and seminar, students ground their understanding in STEM course work using algebraic methods, graphical analysis, and computer programming. Special emphasis will be placed on community-based problems and problem-solving strategies. Computer Science and Pre-Calculus students will support Ypsilanti Meals on Wheels as they produce efficient routing systems, spreadsheets to determine cost per hot/cold meal, and technology to produce an annual report.

Includes COSC 111-Introduction to Programming & MATH 105-College Algebra.

3. CSIE 277: Indicator Species- Stoneflies Search for Huron River Watershed and Friends of Rouge River

This course is seminar course intended to complement and integrate the material covered in both BIOL120 Introductory Biology II and CHEM 123/124 General Chemistry II. The course will include participation in the Friends of the Rouge's (FOTR) Annual Stonefly Search as an integral academic service-learning project. Upon completion of this course, you should be able to:

- Carry out a scientific project
- Analyze data using Excel
- Draw conclusions from analyzed data
- Present a scientific project in poster format
- Work effectively as a member of a scientific team

Includes CHEM 123/124-General Chemistry II & BIOL 120-Introductory Biology II.

4. CSIE 277: Science Olympiad –Event Sponsorship/coordination

This special CSIE seminar trains EMU students to assist in the organization and coordination of the Washtenaw County Regional Science Olympiad. Students apply what they have learned in core disciplinary and instructional methods coursework to staff, equip, run and score the individual events at the regional competition. This experience provides development of leadership, interpersonal, organizational, and communication skills while providing a service to the host college and university.

Co requisite Enrollment: Phase I Content Methods, Literacy and Technology.

5. CSIE 377: Modeling Concrete Mechanical Systems using MATLAB:

An interdisciplinary course on the connections between classical mechanics and differential equations. The seminar will explore the mathematical modeling of various concrete mechanical systems using differential equations and software. Check back for more information regarding CSIE seminar/AS-L project specifics.

Includes MATH 325-Differential Equations & PHY 330-Intermediate Mechanics I.

6. CSIE 277: Coaching Science Olympiad

This special CSIE seminar trains EMU students to become effective Science Olympiad Coaches. Students apply what they have learned in core disciplinary and instructional methods coursework to assist area 6th – 12th grade teams. Students apply their knowledge of math, science, and engineering to Science Olympiad challenges. Science Olympiad is an extra-curricular program with regional, state and national competitions. This experience provides development of leadership and interpersonal skills while providing valuable service to local schools.

Co requisite Enrollment: Phase II Content Methods, Literacy and Technology.

7. CSIE 277: Digitized Motion Studies

In this cluster, calculus and physics students will apply such principles as vector analysis, integrals, velocity, and Newtonian laws to model real-life scenarios. Students analyze digital videos using sophisticated graphing programs to visualize 3-dimensional motion in 2-dimensional equations.

Includes PHY 223-Mechanics and Sound & MATH 121-Calculus II.

8. CSIE 177: Playpump Hydraulics

Project teams model simple water transportation devices, such as rollers and pumps, and filtration/purification devices to see how engineers use design to improve quality of life in developing countries.

Includes MATH 121-Calculus II & PHY 223-Mechanics and Sound.

9. CSIE 377: Brownbag Organic Analysis

This seminar course will explore relationships between organic chemistry and quantitative analysis, focusing on thermodynamic properties such as pH and pKa, and structures and functions of relevant organic molecules such as indicators for titrations and analytes. Students also explore special topics related to each course that are not typically covered in CHEM 371 or CHEM 281. These will focus on the environmental impact of chemistry on our society while giving students a better understanding of what professional analytical and organic chemists actually do in their jobs.

Includes CHEM 281-Quantitative Analysis & CHEM 371-Organic Chemistry I.

10. CSIE 177: Groundwater Studies

This course provides students that aspire to be professional scientists with an opportunity to participate in a real-world, environment-based scientific investigation while still at a very early stage of their studies. During the Winter 08 semester, the course will focus on potential groundwater contamination in Lenawee County related to the recent spread of “factory farms” in that area. This investigation will be conducted in collaboration with the Washtenaw County Conservation District. Meets for one hour per week, plus one Friday afternoon field trip.

Prerequisite/Concurrent Enrollment: ESSC 110-The Dynamic Earth System or BIOL 110-Introductory Biology I or CHEM 121-General Chemistry I.

11. CSIE 177: Biodiversity Counts

Students will apply their statistical knowledge from MATH 170 to analyze data in biological sciences field research. This is a great opportunity to learn how to use statistics in solving real life problems. Students will also improve their understanding of how to report and interpret statistical findings. Is it really a problem if global temperature increases ½ a degree on average? How do you count fish populations in the Great Lakes and measure migratory change? We will be using EXCEL software for data analysis purposes. This software will be introduced to students (no previous knowledge is required). Students will become proficient in making tables, using statistical functions, and creating charts to show results.

Includes MATH 170-Elementary Statistics.

12. CSIE 177: Inconvenient Truths

Students will evaluate science topics for clarity, accuracy and misleading information using a variety of media sources including science periodicals, TV, and the internet. Students will prepare a conference-quality poster to communicate complex information and research findings from the Great Lake Environmental Research Laboratory to the general public. The final project will include an oral presentation on a topic of interest with proper use of Power-Point© presentation.

Includes CTAS 124-Fundamentals of Speech & CHEM 117/118-Fundamentals of Chemistry Lecture and Lab.

13. CSIE 177: Superpowered Applications for Elementary Math and Physics

Mathematics and physics are all around us. Understanding the connections makes teaching simple concepts and problem solving exciting for elementary students. CSIE students will learn how to integrate physics and mathematics content and demonstrate applications through hands on classroom experiences and experiments.

Includes MATH 108-Mathematical Reasoning: Applications for Elementary School Teachers & PHY 100-Physics for Elementary Teachers.

14. CSIE 277: Building Secure Firewalls

The Web is being used to transmit and collect sensitive personal information, money, and data. Weaknesses are often inherent in the structure designers select. Students will assess non-profit or local government webpages for security weaknesses.

Includes MATH 205-Math Structures for Computer Science and IA202-Risk-Vulnerability Analysis.

15. CSIE 377: Microbes in Health and Disease

This course is designed to assist the student in understanding the application of microbiology in our lives as well as broadening the understanding of other microbiology related careers. Students will explore the role of various microbes (i.e., bacteria, viruses, fungi, yeast, etc.) and how they directly impact their lives. Students will participate in such activities as “Disease Detectives” for high school students, tours of clinical laboratories, state health laboratories and food testing laboratories. This course is open to all Allied Health (i.e., Nursing, Dietetics, Clinical Laboratory Science, etc.) and Science students who have completed or are currently taking MICR 328: Introductory Microbiology and CLSC 335: Clinical Immunology.

Includes MICR 328-Introductory Micro Biology or CLSC 432- Clinical in Micro Biology.

16. CSIE 377: Ethical Issues in Genetics

In this one credit CSIE seminar, students will examine the kinds of genetics information available, what genetic information can tell us, and the ethical issues surrounding such information. Topics such as genetic defects, genetic predispositions, and genealogy will be discussed, as well as privacy and genetic discrimination. CSIE 377 will contain a service learning component.

Includes BIOL 301-Genetics and PHIL 223-Medical Ethics.

17. CSIE 277: Weather and the Universe: Global Warming

CSIE 277 is a seminar course that accompanies specific sections of ASTR 205 and ESSC 21. In this course the students will learn how to apply the concepts and methods they have learned in introductory astronomy, introductory earth science and their current weather class to real problems in those disciplines. This semester the focus will be on a study of global warming. The students will become familiar with paleoclimatology research on past global warming events, learn how other planets in our solar system have had similar cyclic weather patterns, and investigate the benefits and risks associated with engineering global climate changes. The students will be expected to participate in an Academic Service Learning project by disseminating what they have learned to a local high school earth science class (or classes).

Includes ESSC 212 and ASTR 205.

18. CSIE 177: Algebra/Trig Workshop for Science Technology Engineering and Mathematics (STEM)

Generic problems and solutions from MATH 105: College Algebra and MATH 107: Plane Trigonometry are applied to specific exercises from chemistry, physics, earth science, and biology in a small-group workshop environment. Apply “generic” math concepts to specific problems that you will use in your major classes. You will develop a notebook of examples, rules, and tools to use as a reference in your other classes. You will also get a preview of how calculus will build upon these essential skills to better prepare you for the next level.

Includes MATH 105-College Algebra and MATH 107-Plane Trigonometry.