
3 Credits

Instructors:

Drs. Rob Strongin and Stefanie Kautz

Contact:

Kautz: Email: skautz@pdx.edu

Strongin: Email: strongin@pdx.edu

Office hours:

Kautz: Mondays 10:00-11:00 (SRTC, B1-62D) and by appointment

Strongin: by Email appointment

Teaching Assistants:

Brie Tripp, tripp@pdx.edu, Office Hours Tuesdays 1:00 – 2:00 (SB1 615)

Ian Munhenzva, ian26@pdx.edu, Office Hours Thursdays 1:00 – 3:00 (CLSB 3N072)

Class Location: CLSB, Room 2N079

When: Mon & Wed. 1:00 – 3:50 PM

Required materials: Reading materials will be from the primary literature. Materials will have provided through d2l and identified through (guided) student searches in *Web of Science*. Students should have a solid background in plant biology and chemistry.

You will also need:

- Safety goggles, if necessary (available in stock room)
- Lab coat will be provided
- Nitrile Gloves will be provided

Prerequisites

The prerequisite for the CHEM+BIO CURE is CH 339 or BI 336 or consent of instructor

Course Overview: This class is a novel, discovery-oriented, collaborative research course that will provide you with an idea how ‘research’ actually looks like. In this second term of the ChemBio CURE, we will have the opportunity to build on the experience previously gained in Winter 2017. You will learn how to explore your creativity by asking scientific questions, proposing hypotheses, and designing studies. Specifically, you will have the opportunity to:

- use natural plant/microbe systems to characterize molecular diversity and function of plant-associated microbes
- analyze the plant chemical phenotype (composition of nutritive and defensive compounds and effects on plant consumers)
- chemically synthesize chromophoric agents for enabling HPLC post-column detection nutritive compounds (protein, sugars)
- develop strategies to test for plant responses to abiotic stresses

Learning Outcomes: Following successful completion of CHEM+BIO CURE students should be able to:

- Develop and test hypotheses
- Perform literature searches to gain core content knowledge to aid in experimental design, test, and support of conclusions
- Summarize and present a scientific article in front of peers
- Design laboratory experiment using chemistry and biology methodologies
- Manipulate reagents and products in a safe manner
- Demonstrate the ability to take accurate and informative notes that would allow another person of similar background knowledge to repeat the procedure with similar results
- Analyze data, evaluate the quality of that data, and to propose methods for improvement.
- Justify their responses to questions using literature
- Prepare professional figures and tables to represent data
- Communicate science in the form of PowerPoint presentation

Class time and attendance: Because this is a lab course, attendance is mandatory. If you must miss a class period, it is your responsibility to make up the missed work during the allotted time for the experiment. If you cannot, then that will negatively affect your grade. The majority of class time will be devoted to laboratory work. Lab work will be complemented with background information and introductions to the specific topics as well as discussion of problems and challenges.

Assignments: Much of your success in this class will depend on your participation in the research project, including daily activities, reading assignments, and quizzes. Assignments for this course will consist of online surveys, quizzes on background reading, skills assessment, and science communication in the form of poster presentations.

Proposed outline:

Wk	Date	Topic	Quiz or alternative	Skill check	Homework
1	04/03	- Introduce instructors and students - Introduction to topic - What's a CURE? - Introducing the CREATE process- students work in teams to concept map the intro (step 1)			Form groups (2-3 students), Literature search Finish CREATE method (step 2) individually Brainstorm ideas
	04/05	- Students from previous term present on their research - Students create a concept map of the whole paper as a team (step 2; turn in)	Turn in all CREATE documents (30 pts)		Develop research project as teams
2	04/10	CREATE Grant Panel voting (step 3)		Web of Science	Elevator pitch on project design

		Training on web search for scientific articles Work in class on pitch of research design		search (10 pt)	
	04/12	Student groups present their research design (pitch format), group discussion	Pitches and discussions (20 pt)		
3	04/17	Setting up experiment (plant material, bacteria or fungi) Synthesis of L-betonicine, group A	1 page proposal due (10 pt) Cyanide kit tech bulletin: understanding the reactions (quiz 10 pts)	L-betonicine synthesis (10 pt)	
	04/19	Setting up experiment Synthesis of L-betonicine, group B			
4	04/24	Conversion of sucrose for HPLC, group A HCNp group B	Sucrose paper; interpreting sugar NMR Ballhorn et al. 2005 Both papers in quiz (10 pt)	Sugar and L-betonicine NMR interpretation (10 pt) HCNp (10 pt)	Find own paper for CREATE process
	04/26	Conversion of sucrose for HPLC, group B HCNp group A			
5	05/01	NMR of sugars and synthetic betonicine, group A EFN group B CREATE presentations I	Imprinted polymers for bioanalytes Godschalx et al. 2015 Both papers in quiz (10 pt)	NMR skill check (10 pt) EFN (10 pt)	Mid-term reflection, possibly adjusting experimental design CREATE on own paper as group (20 pt)
	05/03	NMR of sugars and synthetic betonicine, group B EFN group A CREATE presentations II			
6	05/08	Collect data from own experiment CREATE presentations III			Elevator pitch on research project (10 pt)
	05/10	Collect data from own experiment, continued CREATE presentations IV			
7	05/15	Data collection, continued CREATE presentations V		Table prep (10 pt)	Table preparation
	05/17	Finalize data collection, CREATE presentations VI			
8	05/22	Data analysis		Figure prep (10 pt)	Figure preparation

	05/24	Prepare poster			
9	05/29	Memorial Day: No school			Preparation of poster
	05/31	Finalize poster presentation			
10	06/05	Chem+Bio CURE symposium (posters)	Survey (10 pt)		Writing assignment (50 pt) Notebook (50 pt) Poster (50 pt)
	06/07	Last day of class: Manuscript workshop, future outlook			
11	06/14	Writing Assignment due			

Grading System (380 points possible):

Online quizzes or alternative: 50 points (10 points each)

Skill-building checks: 80 points (10 points each)

Pitch of project design and group discussions: 20 point

CREATE literature documents & presentation (both in class and own): 50 points

Writing assignment: 50 points

Poster presentation: 50 points

Lab notebook: 50 points

Lab citizenry: 10 points

Elevator pitch II (research project): 20 points

PLEASE THINK TWICE BEFORE YOU PRINT OUT THE LECTURE PDFs, SYLLABUS OR PAPERS! PLEASE HELP SAVE PAPER – AND OUR FORESTS!

If you must print, double check settings to print 4 slides per page, and print double-sided if possible.

Creating an equitable learning environment:

- Discussion in this class will be conducted in adherence to the University nondiscrimination policy.
- We should respect diverse points of view. We do not need to come to an agreement on any particular issues: we can agree to disagree.
- Our use of language should be respectful of other persons or groups. (As your instructor, I will not let injurious statements pass without comment.)
- You need not represent any group, only yourself, though you may choose to represent a group if you wish.

If you feel uncomfortable about any aspect of the class environment, it is your responsibility to discuss it with the instructor.

- Academic Honesty** Cheating or plagiarism of any kind will not be tolerated. See the PSU “Code of Student Conduct and Responsibility” for more information: <http://www.pdx.edu/dos/conductcode>. **If cheating occurs, the grade for the exam will be a “0” and the student will be reported to University officials as described in the Code (577-031-014: Procedures for Complaints of Academic Dishonesty).**
- Academic Courtesy** Respect the rights of fellow students during the class period. Please avoid talking and other distracting behavior, and turn phones off.
- Disability** If you have a disability and are in need of academic accommodation: first register with the Disability Resource Center (503)725-4150, <http://www.pdx.edu/uasc/drc.html>, then notify Dr. Kautz to make appropriate arrangements. Students with testing accommodation must take exams on the same day as scheduled lecture exams.
- Lost and Found** If you have lost an item at CLSB, first check with your instructor or TA to see if it was turned in. You may also leave a message at the OHSU Department of Public Safety Lost & Found voicemail line at 503-494-0881, or email them at pubsafe@ohsu.edu. Your call will be returned once the Lost & Found administrator checks for your item.
- Safe Campus Module** Portland State University is committed to creating a safe campus for all students, and as part of this you are required to complete the Safe Campus Module in D2L. Log in to D2L, and under "My Courses," you'll find a sub-tab titled "Ongoing." Under the "Ongoing" sub-tab, you will see a course titled "Creating a Safe Campus." Click on this course and follow the prompts to complete the module.
- Emergency Information** In case of emergency, if you are inside CLSB dial **503-494-4444**. If you are outside the building or walking back to campus dial **911**.
PSU 24 hour Campus Safety: emergency 503-725-4404, non-emergency 503-725-4407
- Other PSU Resources**
- Student Health and Counseling: 503-725-2800, <https://www.pdx.edu/shac/>
 - Women’s Resource Center: 503-725-5672, <http://www.pdx.edu/wrc/>
 - Global Diversity and Inclusion, 503-725-5919, <http://www.pdx.edu/diversity/>
 - C.A.R.E Team: <http://www.pdx.edu/dos/care-team>