Course Syllabus - CHBIO 510

Course Number:	CHBIO 510
Course Name:	Chemical Biology II
Quarter:	SP
Year:	2018
Start Date:	03/26/2018
End Date:	06/15/2018
Credits:	3.0
Last Date To Add This Course:	04/09/2018
Last Date To Drop This Course:	04/09/2018
Last Date To Change Grading Option:	04/09/2018
Minimum Class Size:	1

Meeting Days and Times

Day	Start	End	Location	Description
M	11:30 am	12:30 pm	CA Campus	Keck
M	2:30 pm	3:30 pm	FL Campus	B158
W	11:30 am	12:30 pm	CA Campus	Keck
W	2:30 pm	3:30 pm	FL Campus	B158
F	11:30 am	12:30 pm	CA Campus	Keck
F	2:30 pm	3:30 pm	FL Campus	B158

Course Managers

Role	Last Name	First Name	Department	Mail Code	Phone	Email	Organization Name (non-TSRI personnel)
Course Director	Dawson	Philip	Department of Chemistry	BCC-123	(858) 784-7015	dawson@scripps.edu	
Course Director	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
Course Director	Wolan	Dennis	Department of Molecular Medicine	SR-105	(858) 784-7936	wolan@scripps.edu	
TA	Shirey	Ryan	TSRI Graduate Program	TRY-10	(858) 784-8469	rshirey@scripps.edu	
TA	Hackler	Amber	TSRI Graduate Program	3B2	(561) 228-2385	ahackler@scripps.edu	

Course Description

This is a 3 credit course designed to give a broad overview of the fields of chemical biology, with a focus on the development of small molecule drug development. We cover some of the most exciting and pertinent methods at the frontiers of chemical biology, including activity-based protein profiling, and mass-spectrometry-based proteomics. We also describe how probe discovery and development in chemical biology relates to modern methods of drug discovery.

Background Preparation (Prerequisites)

Undergraduate level organic chemistry and biochemistry. Completion of Chemical Biology I, Bioorganic Chemistry, or Structural Biology STBIO 410.

Texts and Journal References

Type	Title	Author	Date	ISBN/ISSN
Required	No textbook is required for this course. Scientific papers will be referenced throughout the course providing further reading for specific topics discussed.			

Course Learning Outcomes

By the end of this course, students will be able to:
1. Understand current methods for the discovery of biologically active small molecules.
2. Understand how small molecules can be used to probe cellular function.
3. Understand chemical methods to monitor and manipulate the proteome.
4. Understand basic aspects of drug discovery and development, including small molecules and biologics.
5. Understand the major outstanding problems in the field.

Course Requirements and Assignments

1. 25% of grading will be derived from attendance, class participation, and preparedness.
2. 50% of grading will be derived from a mid-term (25%) and a final exam (25%). These exams will be focused on the integration of the presented material over the course of the class.
3. 25% of the grading will be based on literature presentations.

Other Information

This class will cover topics on the frontiers of chemical biology. For each segment, an appropriate review article will be provided to provide a primer to each major topic. However, most of the content of the class will come from the primary literature and several papers will be required reading for each lecture. Papers will be assigned to specific students who will guide the discussion at literature sessions. Reading assignments will be provided well in advance. Participation and interaction are strongly encouraged in class. Students are expected to challenge the status quo, if justified, but to do so in a constructive and respectful fashion.

Attendance Statement

Attendance to all lectures is mandatory. The progression of lectures requires consistent attendance as the course is designed to build on fundamental principles taught in previous lectures. Students are responsible for their own work, and must obtain permission from the instructor if they must miss a class.

Scientific and Professional Ethics

Work presented in this course must be the students' own. We encourage them to criticize and react to ideas of classmates, professors, and authors, but they must acknowledge the ideas of others and reference them accordingly. If there are questions regarding scientific ethics, the course directors should be contacted so that they can provide clear guidance.

Course Grading Statement

The midterm and final each constitute 25% of the final grade. Literature presentations will constitute another 25%, and the remaining 25% will be determined by attendance, class participation, and preparedness.

Letter Grade Descriptions

Letter Grade	Grade Point	Description	Learning Outcome
A	4.00	Outstanding achievement. Student performance demonstrates full command of the course subject matter and evinces a high level of originality and/or creativity that far surpasses course expectations.	
A-	3.67	Excellent achievement. Student performance demonstrates thorough knowledge of the course subject matter and exceeds course expectations by completing all requirements in a superior manner.	
B+	3.33	Very good work. Student performance demonstrates above-average comprehension of the course subject matter and exceeds course expectations on all tasks as defined in the course syllabus. There is notable insight and originality.	
B	3.00	Satisfactory work. Student performance meets designated course expectations and demonstrates understanding of the course subject matter at an acceptable level.	
B-	2.67	Marginal work. Student performance demonstrates incomplete understanding of course subject matter. There is limited perception and originality.	
C+	2.33	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.	
C	2.00	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.	
P	0.00	Satisfactory work. Student performance demonstrated complete and adequate understanding of course subject matter. Course will count toward degree.	
F	0.00	Unacceptable work/Failure. Student performance is unacceptably low level of knowledge and understanding of course subject matter. Course will not count toward degree. Student may continue in program only with permission of the Dean.	
I	0.00	Incomplete is assigned when work is of passing quality but is incomplete for a pre-approved reason. Once an incomplete grade is assigned, it remains on student's permanent record until a grade is awarded.	
W	0.00	Withdrew from the course with Dean's permission beyond the second week of the term.	

- All courses will be recorded and maintained in the student's permanent academic record; only courses that apply towards the degree will appear on the academic transcript. Non-credit or audited courses will not appear on the transcript.
- 4 core courses taken for a letter grade (pass = A or B for a core course)
- 2 elective courses taken pass/fail (pass = A, B, C for an elective)
- Because students are encouraged to take electives outside their area of expertise, a "C" letter grade is passing.
- Grading will be based on general attendance/participation, student presentations of the classic and contemporary publications, and

Course Schedule

Date	Type	Topic or Lecture Title	Presenter Last Name	Presenter First Name	Presenter Department	Presenter Mail	Presenter Phone	Presenter Email	Organization Name (non-TSRI personnel)
03/26/2018	Lecture	Chemical biology: Origins and goals	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
03/28/2018	Lecture	Lessons from natural products	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
03/30/2018	Lecture	Natural products as drugs and probe molecules	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
04/02/2018	Lecture	Journal article presentations (Natural Products)							
04/04/2018	Lecture	Chemical dimerizers I	Erb	Michael	Department of Chemistry	SR-202	(858) 784-7034	michaelerb@scripps.edu	
04/06/2018	Lecture	Chemical dimerizers II	Erb	Michael	Department of Chemistry	SR-202	(858) 784-7034	michaelerb@scripps.edu	
04/09/2018	Lecture	Journal article presentations (dimerizers)							
04/11/2018	Lecture	HTS/De novo ligand discovery I	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
04/13/2018	Lecture	HTS/De novo ligand discovery II	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
04/16/2018	Lecture	Journal article presentations (HTS)							
04/18/2018	Lecture	Mass spectrometry methods in chemical biology I	Wolan	Dennis	Department of Molecular Medicine	SR-105	(858) 784-7936	wolan@scripps.edu	
04/20/2018	Lecture	Mass spectrometry methods in chemical biology II	Wolan	Dennis	Department of Molecular Medicine	SR-105	(858) 784-7936	wolan@scripps.edu	
04/23/2018	Lecture	Journal article presentations (MS methods)							
04/25/2018	Lecture	Phenotypic screening I	Lairson	Luke	Department of Chemistry	SR-202	(858) 784-9335	llairson@scripps.edu	
04/27/2018	Lecture	Phenotypic screening II	Lairson	Luke	Department of Chemistry	SR-202	(858) 784-9335	llairson@scripps.edu	
04/30/2018	Lecture	Journal article presentations (Phenotypic screening)							
05/02/2018	Lecture	Characterization of small molecule-biomolecule interactions in vitro	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
05/04/2018	Lecture	Characterization of small molecule-biomolecule interactions in cellulo and in vitro	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu	
05/07/2018	Exam	Midterm							
05/09/2018	Lecture	Drug development: case studies	Lairson	Luke	Department of Chemistry	SR-202	(858) 784-9335	llairson@scripps.edu	

05/11/2018	Lecture	The drug discovery process: the long road from hit to drug	Rosen	Hugh	Department of Chemical Physiology	MEM-L55	(858) 784-2396	hrosen@scripps.edu
05/14/2018	Lecture	Journal article presentations (drug development)						
05/16/2018	Lecture	Drug metabolism	Wolan	Dennis	Department of Molecular Medicine	SR-105	(858) 784-7936	wolan@scripps.edu
05/18/2018	No Class	Commencement						
05/21/2018	Lecture	Development of drug resistance and how to cope with it	Wolan	Dennis	Department of Molecular Medicine	SR-105	(858) 784-7936	wolan@scripps.edu
05/23/2018	Lecture	Site-specific modification of biomolecules	Dawson	Philip	Department of Chemistry	BCC-123	(858) 784-7015	dawson@scripps.edu
05/25/2018	Lecture	Bioorthogonal reactions	Dawson	Philip	Department of Chemistry	BCC-123	(858) 784-7015	dawson@scripps.edu
05/28/2018	No Class	Memorial Day						
05/30/2018	Lecture	Chemical biology in engineered cells I	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu
06/01/2018	Lecture	Chemical biology in engineered cells II	Kodadek	Thomas	Department of Chemistry	3A2	(561) 228-2461	kodadek@scripps.edu
06/04/2018	Lecture	Review session						
06/06/2018	Exam	Final						