

Add Course Request

Submitted on: 2013-09-20 20:51:19

1. COURSE SUBJECT	PHAR
2. COURSE NUMBER (OR PROPOSED NUMBER)	1005
3. COURSE TITLE	Molecules in the Media
4. INITIATING DEPARTMENT or UNIT	Pharmaceutical Sciences
5. NAME OF SUBMITTER	Marcy J Balunas
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11. EMAIL of of contact person	Email: marcy.balunas@uconn.edu
12. Departmental Approval Date	04/10/2013
13. School/College Approval Date	08/23/2013
14. Names and Dates of additional Department and School/College approvals	
15. Proposed Implementation Date	Term: Spring , Year: 2015
16. Offered before next printed catalog is distributed?	No
17. General Education Content Area	Content Area 3 Science and Technology
18. General Education Skill Code (W/Q). Any non-W section?	None
19. Terms Offered	Semester: Spring Year: Every_Year
20. Sections	Sections Taught: 1
21. Student Number	Students/Sections: 100
22. Clarification: We anticipate that approximately 100 students will enroll in the course for the first offering, with a maximum capacity for 300 students.	
23. Number of Credits	3 if VAR Min: Max: credits each term
24. INSTRUCTIONAL PATTERN	

This course will meet Mondays, Wednesdays, and Fridays for 50 minutes. Weekly discussion sections will be held by teaching assistant(s) using an online system (e.g., HuskyCT). Exam review sessions will be conducted in person by TAs during the weeks that precede exams.

25. Will this course be taught in a language other than English? No
If yes, then name the language:

26. Please list any prerequisites, recommended preparation or suggested preparation:
No prerequisites are required as this is an introductory course meant for the non-scientist.

27. Is Instructor, Dept. Head or Unit **Consent Required**? No

28. Permissions and Exclusions:

29. Is this course **repeatable for credit**? No
If yes, total credits allowed:
Allow multiple enrollments in same term?

30. **Grading Basis** Graded

31. If satisfactory/unsatisfactory grading is proposed, please provide **rationale**:

32. Will the course or any sections of the course be taught as Honors?
no

33. Additional Details:

34. Special Attributes:

35. **REGIONAL CAMPUS AVAILABILITY:**

Students from the regional campuses are permitted to take the course. However, the course will be located at the Storrs campus so regional campus students will need to travel to participate.

36. **PROVIDE THE PROPOSED TITLE AND COMPLETE CATALOG COPY:**

PHAR 1005. Molecules in the Media

Three Credits. Three 1 hr lecture periods. Not open to pharmacy students in the Professional Program.

This course is designed for non-science majors and will introduce students to the fundamental concepts of chemistry and biology by exploring these concepts within the context of common molecules discussed in the media on a daily basis. Major topics to be discussed include the structure and function of essential biological macromolecules, the mechanisms through which various molecules regulate natural processes, and the design and development of synthetic small molecules as therapeutic agents.

37. **RATIONALE FOR ACTION REQUESTED**

A) Reason for adding the course. There are two main reasons this course is being proposed. First, we believe that an integrated curriculum that focuses on a “current events” approach will provide a platform that more fully engages the non-science major in understanding the fundamental aspects of both chemistry and biology. Second, the addition of a new 1000 level course that satisfies the requirements of a Content Area 3 Course provides additional opportunities for undergraduates to satisfy this core requirement of their general education.

B) Why course is appropriate for inclusion at 1000 or 2000 level. This course will provide students with a basic understanding of the general concepts of chemistry, biology, biochemistry, and medicinal chemistry. As it will be offered primarily to non-science majors, these topics will be broadly explored and the depth is most appropriate for an introductory level course.

C) Justification for enrollment restrictions. Based on the anticipated teaching assistant support for this course and its status as a new course, it will be initially opened to 100 students. We anticipate that within 3-5 years, exposure and word-of-mouth will increase demand and we hope to expand to 300 students provided additional university support (TAs and teaching space) is available.

D) Effect on other departments. We anticipate a positive effect on other departments, primarily through the potential reduction of their teaching load through the offering of an additional 1000 level course that will satisfy the Content Area 3 requirements for non-science majors.

E) Amount of overlap with existing courses. Individual concepts discussed in this course may overlap with topics discussed in the following existing courses:

BIOL 1102: The Biology of Human Health and Disease.

CHEM 1101: Chemistry for an Informed Electorate.

It is important to note that neither of these classes is currently offered to students on a regular basis. In addition, the integrated nature of our proposed course provides a significant difference in educational style compared to the above listed courses.

F) Other departments consulted. Chemistry. We contacted the Chemistry Department Head, Dr. Amy Howell, who indicated that CHEM 1101 has not been offered in several years and would not significantly overlap with our proposed course were it to be offered in the future.

G) Effects on regional campuses. None

H) Specific costs approved by the Dean. None

I) If course is to be cross-listed, supply reason for cross-listing. Not cross listed

J) If course is to be offered as an experimental course, provide reason. Not an experimental course.

38. SYLLABUS:

Online URL: (https://web2.uconn.edu/senateform/request/course_uploads/mjb10021-1379724650-Med Chem Gen Ed syllabus.docx)

39. Course Information: ALL General Education courses, including W and Q courses, MUST answer this question

A. Brief course description. The overall objective of this course is to introduce students to the fundamental tenets of chemistry and biology by exploring these concepts as they relate to common molecules we see every day in the media. Essential molecules to be discussed include,

but are not limited to, the following: biological macromolecules, natural products, small molecule regulators of natural and biological functions, and drugs.

B. Course requirements.

1. Overall Grading and Exam Format: Grading will be based on three in-class exams (15% each, 45% total), a cumulative final exam (35%), and a 3-page written report (20%). The final exam will consist of two parts including non-cumulative material from the last part of the semester and a cumulative section covering all course material. Exam questions will be a mix of multiple choice and short answer with exam scores to be posted on HuskyCT. Exams and answer sheets will not be returned. Exam reviews can be scheduled with one of the TAs for students to review their exams.

2. Format for writing assignment: For the written report, students will be provided a list of 20 “Molecules in the Media” that are not scheduled to be covered during the class. Each student will choose a molecule from the list to write a 3-page report on. The report will include information as to how the structure of the molecule specifically contributes to its function, what role it serves either in nature or the human body, and how its development contributed to our understanding of a major chemical or biological problem/system.

3. Scope of reading assignments: As this course is focused on current and up-to-date molecules, an appropriate textbook that covers all the topics proposed is not available. Initially, the faculty will work with the UCONN Co-op to develop a course pack that will include the following for each molecule in the syllabus: (1) a major media article describing the molecule, (2) a structure of the molecule, and (3) 2-3 primary scientific literature articles that describe the importance of the molecule. Students will be required to read the section associated with each molecule prior to the classroom lecture on that specific compound. A long-term goal of the faculty (5 yrs) is to develop a new textbook that will be utilized in the future.

C. Major themes, topics, issues to be discussed. Following completion of the course, students will be able to address the following main topics.

- (1) Describe the structure and function of essential biological molecules, including DNA, protein, carbohydrates, and lipids.
- (2) Explain how altered regulation of DNA and protein contributes to human disease.
- (3) Understand how small and macromolecules are used in both humans and nature to regulate natural processes.
- (4) Understand the drug discovery process.
- (5) Identify the major classes of drugs on the market and understand how their structures contribute to their activity.

D. Not Applicable

40. Goals of General Education: All Courses Proposed for a Gen Ed Content Area MUST answer this question

As listed in the General Education Guidelines, the goals of general education at UCONN are to “ensure that all University of Connecticut undergraduate students become articulate and acquire intellectual breadth and versatility, critical judgment, moral sensitivity, awareness of their era

and society, consciousness of the diversity of human culture and experience, and a working understanding of the processes by which they can continue to acquire and use knowledge.” Through an integrated curriculum, students will become articulate in several aspects of the basic (chemistry, biology, and biochemistry) and applied (medicinal chemistry) sciences. Our newly proposed course will directly contribute to students’ awareness of the current era by exploring the fundamental scientific molecules that they encounter on a daily basis. Finally, this course will provide them with a background of basic scientific knowledge that can be used to critically analyze technological and pharmaceutical advances throughout their lives.

41. Content Area and/or Competency Criteria: ALL General Education courses, including W and Q courses, MUST answer this question.: Specific Criteria

- a. **Arts and Humanities:**
- b. **Social Sciences:**
- c. **Science and Technology:**

A central tenet of the Content Area 3 Courses at UCONN is to acquaint students with the ways in which science affects their everyday lives in order to prepare them to make informed decisions with regards to scientific, technological, and pharmaceutical developments. This course is specifically designed to introduce students to biological and chemical “principles of life” that govern how natural processes are regulated with various molecules and how scientific researchers use this knowledge to develop and improve our lives with therapeutic agents.

- i. **Laboratory:**
- d. **Diversity and Multiculturalism:**
 - 43. **International:**
- e. **Q course:**
- f. **W course:**

42. RESOURCES:

Does the department/school/program currently have resources to offer the course as proposed
NO

If NO, please explain why and what resources are required to offer the course.

The Department of Pharmaceutical Sciences has very limited teaching assistant positions. The proposed course will require a significant amount of grading (exams and essays) as well as discussion sections and exam review sessions. Given the number of students we anticipate will enroll in the course, the faculty will need teaching assistants to help support student learning and course administration. Therefore we will need at least one teaching assistant position for each 100 students who enroll in the course.

43. SUPPLEMENTARY INFORMATION:

ADMIN COMMENT:

Senate approved CA4 Int'l 12.9.13 // Senate approved new course 11.11.13. // NewCA3-nonLab_092313kcp.

PHAR 1005: Molecules and the Media

Spring 2015

Course Details

Credits: 3

Room: To be determined

Class meetings: MWF 50 minutes

Course Goals and Objectives

This course is designed to introduce students to basic fundamentals of medicinal chemistry and drug discovery through discussions of molecules that have received media attention. The course will begin with an introduction to biochemistry fundamentals for the non-specialist and proceed to discuss several important molecules with relevance to medicine, nutrition, and science. The course is designed for students with a limited scientific background but can be taken by students with varied interests.

The overall objective of this course is to introduce students to the fundamental tenets of chemistry and biology by exploring these concepts as they relate to common molecules we see every day in the media. At the end of the course, students will be able to:

1. Describe the structure and function of essential biological molecules, including DNA, protein, carbohydrates, and lipids.
2. Explain how altered regulation of DNA and protein contributes to human disease.
3. Understand how small and macromolecules are used in both humans and nature to regulate natural processes.
4. Understand the drug discovery process.
5. Identify the major classes of drugs on the market and understand how their structures contribute to their activity.

Instructors*

Dr. Amy Anderson, PBB 634, 860-486-6145, amy.anderson@uconn.edu

Dr. Marcy Balunas, PBB 630, 860-486-3051, marcy.balunas@uconn.edu

Dr. Kyle Hadden, PBB 628, 860-486-8446, kyle.hadden@uconn.edu

(Dr. Olga Vinogradova, PBB 632, 860-486-2972, olga.vinogradova@uconn.edu)

(Dr. Andrew Wiemer, PBB 633, 860-486-3966, andrew.wiemer@uconn.edu)

(Dr. Dennis Wright, PBB 629, 860-486-9451, dennis.wright@uconn.edu)

*There will be three professors who will co-teach the course each semester. These will be rotated yearly and will encompass the broad expertise found within the Division of Medicinal Chemistry, including macromolecules, small molecules, and chemical biology.

Teaching Assistants

Teaching assistants will hold weekly discussion sections to address student questions as well as to explore course material in more detail. These discussion sections will be held online via HuskyCT. In addition to weekly discussion sections, TAs will hold in-person exam review sessions prior to each exam.

Office Hours

Faculty and teaching assistants will hold weekly office hours as posted during the beginning of the course.

Textbook(s)

As this course is focused on current and up-to-date molecules, an appropriate textbook that covers all the topics proposed is not available. A course pack will be available at the UConn Co-op that will include the following for each molecule: (1) a major media article describing the molecule, (2) a structure of the molecule, and (3) 2-3 primary scientific literature articles that describe the importance of the molecule. Students are required to read the sections associated with each molecule prior to the classroom lecture on that specific compound.

There are also two optional textbooks for this course:

1. Ng, Rick. 2009. *Drugs: From Discovery to Approval*, 2nd Edition.
2. Corey, E.J.; Czakó, B.; Kürti, L. 2007. *Molecules and Medicine*.

Course Format

The course will primarily consist of didactic lectures and discussions. Active participation in discussions is expected during class. Students are expected to read the required and recommended chapters and complete other assignments prior to the lecture.

Course Policies

- All policies, rules and regulations [regarding absences, cheating, other conduct, respect for the rights of others, etc.] of the University of Connecticut apply to PHAR 1005.
- This course follows the University's policies on academic misconduct as published in the Student Conduct Code. Students found through due process to be in violation of this code will, at a minimum, receive no course credit for the involved course work. Appropriate classroom conduct is expected at all times.
- Missed Exam Policy
 - It is critical that you take exams in this course during the scheduled times. In rare cases, such as dire illness or an emergency, if you find that you must miss an exam, you should discuss the situation with the course coordinator and attempt to seek approval ahead of time. The instructors will make the decision regarding whether a make-up exam will be allowed. If the instructor agrees to a make-up exam, it may have a different format than the regularly scheduled exam.
- Students with Disabilities
 - Students with disabilities or special needs are encouraged to contact the Center for Students with Disabilities (Phone 486-2020) regarding accommodations for exams.
- Inclement weather/University class cancellations
 - When the University or teaching faculty cancels class, the course coordinator will communicate with the class how make-up class sessions and/or materials to be covered. This information will be disseminated to the class in a timely fashion, most likely via HuskyCT.

Grading

Grades will be based on three in-class exams and a final exam that will include non-cumulative material from the last portion of the semester as well as a cumulative portion covering material from the whole semester. Exam scores will be posted on HuskyCT. Exams and answer sheets are not returned. Students who wish to review their exams may do so with the instructor. Removal of exams from the room in any form will constitute academic misconduct.

In addition to exams, there will be a required written report. Students will be provided a list of 20 "Molecules in the Media" that are not scheduled to be covered during the class. Each student will choose a molecule from the list to write a 3-page report on. The report will include information as to how the structure of the molecule specifically contributes to its function, what role it serves either in nature or the human body, and how its development contributed to our understanding of a major chemical or biological problem/system.

Exam 1 = 15%

Exam 2 = 15%

Exam 3 = 15%

Final Exam = 35%

Essay = 20%

Grade scale

100-94	A	82-80	B-	69-67	D+
90-93	A-	79-77	C+	66-63	D
89-87	B+	76-73	C	62-60	D-
86-83	B	72-70	C-	<60	F

Faculty reserve the right to adjust the grading scale to meet the needs of the course and overall class performance.

Course Schedule

Lecture	Topic	Faculty
1	Class Introduction and the Basics of Life <i>The elements and the solvent of life</i>	
2	What is a molecule? <i>Small molecules vs. macromolecules, single vs. double bonds, 2D vs 3D structures</i>	
3	L-Tryptophan <i>Amino acids, stereochemistry, acid vs. base, solubility</i>	
4	Botox <i>Protein structure and function, ligand vs. receptor vs. enzyme</i>	
5	Firefly Luciferase <i>Enzymes: How does a firefly produce light?</i>	
6	DNA and RNA <i>The genetic codes of life</i>	
7	<i>Mycoplasma laboratorium</i> <i>The origins of DNA/RNA, Primordial Soup, RNA world hypothesis, Synthetic DNA</i>	
8	BRCA1: The Breast Cancer Gene <i>DNA mutation and disease, personalized medicine and pharmacogenomics</i>	
9	Splenda <i>What is a carbohydrate? What is glucose? Natural vs. artificial sweeteners</i>	
10	Trans Fat vs. Omega-3 Fatty Acids <i>Lipids, good vs. bad cholesterol, fatty acids, triglycerides, lipoproteins</i>	
11	Adenosine triphosphate (ATP) <i>Nature's energy source</i>	
12	Test #1 – Lectures 1-10	
13	RU-486 <i>What is a hormone? Estrogen vs. Testosterone</i>	
14	Vitamin C and D <i>What is a vitamin? Where do they come from? What do they do?</i>	
15	Epinephrine, Serotonin, and Dopamine <i>What is a neurotransmitter?</i>	

16	Penicillin <i>What is a natural product?</i>	
17	Limonene and Camphor <i>Terpenes and the sense of smell</i>	
18	Echinacea, St. John's Wort, and Ginkgo Biloba <i>The science of herbal supplements</i>	
19	Resveratrol <i>Aging, chemoprevention, and heart disease</i>	
20	Homoserine Lactones <i>Small molecules that govern cellular/bacterial movement</i>	
21	Demystifying Drug Discovery <i>Why do drugs cost so much? What is a generic drug? What is a side effect?</i>	
22	Test #2 – Lectures 11-20	
23	Alcohol, Caffeine, and Nicotine <i>The most common drugs we don't think of as drugs</i>	
24	Aspirin, Tylenol, and Ibuprofen <i>How do these pain agents differ?</i>	
25	Amphetamines <i>Methamphetamines vs. Sudafed vs. Adderall</i>	
26	Codeine, Morphine, and Heroin <i>How small structural differences can have dramatic biological effects</i>	
27	Lipitor <i>Statins to lower high cholesterol; mechanism of action</i>	
28	Prozac and Cymbalta <i>Major classes of anti-depressants and how they work</i>	
29	Metformin and Januvia <i>Diabetes as a metabolic disease of high glucose.</i>	
30	Albuterol and Singulair <i>What is asthma? How do anti-asthma drugs work?</i>	
31	AZT <i>Antivirals and drug cocktails</i>	
32	Test #3 – Lectures 21-31	
33	Taxol <i>Development of a novel anti-cancer agent</i>	
34	Gleevec <i>Development of a kinase inhibitor as targeted anti-cancer therapy</i>	
35	Fen Phen and Belviq <i>The history and future of anti-obesity medications</i>	
36	Herceptin <i>What is an antibody? Antibodies as drugs; ADCs</i>	
37	MMR and Gardasil <i>What is a vaccine? History and controversy</i>	
38	Human Growth Hormone (HGH) <i>Performance enhancing drugs: steroids, blood boosters, and masking agents</i>	
39	Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA) <i>The development of drug resistance.</i>	
40	Rogaine and Viagra <i>Drug Repurposing: Strategies and success stories</i>	
41	Vioxx and Avandia <i>Drug recalls: What happens when a drug does more harm than good?</i>	
42	Grapefruit Juice <i>Drug Metabolism, Drug-Food and Drug-Drug Interactions</i>	
Final	Final Exam Scheduled by the University During Exam Week Part One: Lectures 32-42; Part Two: Cumulative	All

