CHEM 581/481Organic Chemistry of Biological Processes-DEAdd-2015-10-16

- The workflow icon is no longer available. Please click on the Page Status after the orange circle icon near the page title. *

Form Information

First Step: Change the text in the [brackets] so it looks like this: **CRIM 101 Intro to Criminology-DEAdd-2015-08-10**

Second Step: Click save on bottom right

Third Step: Make sure the word "***DRAFT***" is in yellow at the top of the proposal

Fourth Step: Click on EDIT CONTENTS and start completing the template. When exiting or done, click save on bottom right

When ready to submit click on the workflow icon and hit approve. It will then move to the chair as the next step in the workflow.

Please direct any questions to curriculum-approval@iup.edu
**Indicates a required field*

Proposer*	Dr. Carl LeBlond	**Proposer Email***	carl.leblond@iup.edu
Contact Person*	George Long	**Contact Email***	grlong@iup.edu
Proposing Department/Unit*	Chemistry	**Contact Phone***	2860

Course Level*	graduate-level, undergraduate-level

Distance Education Section

- Complete this section only if adding Distance Education to a New or Existing Course

Course Prefix /Number*	CHEM 481/581
Course Title*	Organic Chemistry of Biological Processes
Type of Proposal*	*See CBA, Art. 42.D.1 for Definition*

Brief Course Outline*	*Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar or assignments*
	
	As outlined by the federal definition of a "credit hour", the following should be a consideration regarding student work - For every one hour of classroom or
	
	direct faculty instruction, there should be a minimum of two hours of out of class student work.
	
	Provides an overview of the organic reactions and mechanisms of importance in biological processes.
	
	1. Introduction and warming up
	  a. Getting acquainted with other participants, Moodle and the chemistry tools you'll use in this course.
	2. Common organic chemistry mechanisms of biological processes
	  a. Functional Groups
	  b. Acids/bases
	3. Organic Mechanisms of importance in biochemistry
	  a. Electrophilic Addition Reactions
	  b. Nucleophilic substitutions
	  c. Nucleophilic addition to carbonyls
	  d. Nucleophilic Acyl Substitution
	  e. Condensation
	  f. Elimination
	  g. Oxidation/Reduction reactions
	4. Biomolecules
	  i. Chirality
	  ii. Carbohydrates, Proteins, Lipids, Nucleic Acids
	  iii. Coenzymes
	5. Carbohydrate metabolisms and biosynthesis
	6. Lipid metabolisms and biosynthesis
	7. Proteins metabolisms and biosynthesis
	8. Nucleic Acid metabolism and biosynthesis
	9. Biosynthesis of natural products
	10. Special topics (e.g. motor protein operation and mechanisms, chemotaxis, Flagella motion)

Rationale for Proposal (Required Questions from CBA)	
How is/are the instructor (s) qualified **in the Distance Education delivery** **method as well as the discipline?***	Dr. LeBlond is the university's leader in developing and implementing Moodle courses. Dr. LeBlond has developed over 20 plugins for teaching interactive online chemistry courses with Moodle and has developed 4 online course for his students in organic chemistry. Dr. LeBlond has over ten years' experience synthesizing and developing biologically active organic molecules and has taught organic chemistry at the undergraduate/graduate level for more than eleven years.

For each outcome in the course, describe **how the outcome will be achieved using** **Distance Education technologies. *** **How will the instructor-student and** **student-student interaction take place?*** **(if applicable)**	Theory will be imparted through narrated slides, video, book readings, literature article reading and interactive online course content /notes developed by Dr. LeBlond. Each student will maintain an individual online Electronic Notebook (EN) in which they will be required to provide examples of the organic reaction mechanisms presented and develop their final course project. The electronic notebook was developed by Dr. LeBlond and tracks students work and time contributed and provides a easy method of commenting /annotating on students work. Students will also be expected to contribute individual, group assignments and their final project to the Course Wiki. **Course Outcome 1:** Define and demonstrate the organic reactions and mechanisms of importance in biological transformations. Students will apply this knowledge through assignments/homework which will utilize my Moodle question types plugins and other chemical structure drawing software I specifically designed for teaching organic chemistry. Students will be expected to provide unique examples of specific reactions in their EN. Students will create and test interactive question with detailed positive/negative feedback using the Question Creation Activity plugin for Moodle. These questions will be reviewed and graded. **Course Outcome 2:** Define and demonstrate the organic chemistry of the major metabolic pathways. Students will apply their knowledge through assignments/homework. In addition students working in groups (2-4 students), will contribute to the Course Wiki, outlining the major organic chemistry of metabolism and biosynthesis of proteins, carbohydrates, lipids and nucleic acids. The Wiki tracks student contributions and will be graded. **Course Outcome 3:** Define the role and organic chemistry of cofactors including organic coenzymes and metal ions. Students will apply their knowledge through assignments/homework and by contributing to the Wiki. Students will be required to provide Wiki entries for specific coenzymes, defining function, structure and providing example reactions. Students will document the progression through the subject by providing evidence in their Electron Notebook. **Course Outcome 4:** Understand the biosynthesis of biologically important natural products (e.g. terpenes, Penicillin, prostaglandins etc). Students will apply their knowledge through a research project in which each student researches and documents the biosynthesis of an important natural product. Students will initially document their work using their Electronic Notebook, but will contribute their final report to the Course Wiki.
How will student achievement be evaluated?	Assignments/homework and projects will be given to reinforce the concepts from theory. Assessment will include exams and quizzes which will be a combination of several question types I developed specifically for organic chemistry (electron flow /mechanism, molecule selection and structure drawing) as well as more conventional question types including multi-choice and short answer In addition the students work on the course Wiki and their Electronic Notebook will be assessed. Students will also develop their own questions utilizing the Question Creation Activity in which students devise question relevant to the course material using my interactive question types. Question submitted will be assessed

How will academic honesty for tests and assignments be addressed?*	Cheating will not be tolerated and any evidence of cheating will result in immediate expulsion from the course. This will be made very clear to students from the beginning. I don't expect enrollment would be much more than 10-20 students since it is a rather advanced course. Therefore student/student cheating would be easily recognized, especially with the Question Creation activity in which the students are synthesizing a problem, solution and appropriate feedback for the question. The use of random questions will be utilized with quizzes/exams when possible. In addition my question types require significant time for students to construct their answers (requiring students to draw structurally complex biomolecules). In such cases I encourage students to seek out the structures online or from textbooks and reproduce them. In my opinion the act of reproducing them with my chemical drawing software leads to better retention. Student assignments submitted to their Electron Notebook and Course Wiki would be examined with TurnItIn if deemed appropriate.

Please scroll to the top and click the Page Status if you are ready to take action on the workflow.
Please submit an ihelp if you have any questions http://ihelp.iup.edu