CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM: BIOLOGICAL AND PHYSICAL SCIENCES

1. **Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

   CHEM 316. ORGANIC CHEMISTRY II LEARNING COMMUNITY (1)
   One hour of recitation per week.
   Corequisite: CHEM 314
   Interactive problem-solving session for students enrolled in CHEM 314 where students work in small groups on problems related to the content in CHEM 314.

2. **Mode of Instruction.**

	Units	Hours per Unit	Benchmark Enrollment
Lecture			
Seminar			
Laboratory			
Activity	1	1	30

3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

   This course accompanies the the second semester organic chemistry course (CHEM 314) and provides students with an interactive, problem-solving session where students work in small teams to solve problems in organic chemistry.

   Students who successfully complete this course will be able to:
   - Outline the development of the field of organic chemistry from a historical perspective and how organic chemistry has impacted society
   - Describe the scientific method and how it is used to approach the study of organic molecules
   - Explain the behavior of organic reactions using their knowledge of thermodynamics and kinetics and the geometric and electronic structures of organic molecules
   - Interpret infrared, mass, and nuclear magnetic resonance spectra of molecules that have arene rings and/or multiple functional groups
   - Identify the reactions and synthesis of alcohols, ethers, aldehydes, ketones, esters, carboxylic acids, amides, amines, carboxylic acid halides, carboxylic acid anhydrides,and enolates
   - Contrast organic reactions with biological reactions
   - Describe the structure, reactions, and properties of carbohydrates and amino acids

4. **Is this a General Education Course** **YES** **(NO)**
   If Yes, indicate GE category:

5. **Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*

   Aromaticity and Aromatic Compounds
   Historical context of the structure of benzene and other organic molecules
   Examples of aromatic and heteroaromatic compounds
   Naming of aromatic compounds

Hückel's Rule
Molecular orbital description of aromatic compounds
Aromatic ions and heterocycles
Spectroscopy of aromatic compounds

Reactions of AromaticCompounds
Electrophilic aromatic substitution
Substituent effects on reactivity and regioselectivity
Synthesis of substituted benzenes
Reactions of substituents
Nucleophilic aromatic substitution
Synthesis and reactions of diazonium salts

Alcohols: Structures and Reactions
Naming of alcohols
Acid-base reactivity of alcohols and phenols and substituent effects on acidity
Synthesis of alcohols by addition reactions
Oxidation of alcohols
Biological examples alcohol synthesis and reactions
Spectroscopy of alcohols

Aldehydes and Ketones: Structures and Reaction
Naming of aldehydes and ketones
Addition and addition-elimination reactions of aldehydes and ketones
Biological examples aldehyde and ketone synthesis and reactions
Spectroscopy of aldehydes and ketones

Carboxylic Acids: Structures and Reactions
Naming of carboxylic acids
Acid-base reactions of carboxylic acids
Synthesis of carboxylic acids
Reactions of carboxylic acids
Fatty acids
Biological examples alcohol of carboxylic acid synthesis and reactions
Spectroscopy of carboxylic acids

Carboxylic Acid Derivatives and their Preparation
Naming of esters, amides, acid halides, acid anhydrides, and nitriles
Nucleophilic acyl substitution mechanism and relative reactivity of carboxylic acid derivatives
Biological examples of carboxylic acid derivative synthesis and reactions
Spectroscopy of carboxylic acid derivatives

Synthesis and Reactions of Enols and Enolates
Enol-keto tautomerization
Acidity of α-hydrogens of carbonyl compounds and synthesis of enolates
Halogenation and alkylation of enols and enolates
Aldol and Claisen condensation reactions
Michael reaction
Biological examples of the reactions of enols and enolates

Amines: Structures and Reactions
Naming of amines and amino acids
Acid-base reactions of amines and anilines
Synthesis and reactions of amines
Tetraalkylammonium salts as phase-transfer agents
Biological examples of amines, their synthesis and reactions
Spectroscopy of amines

Carbohydrates: Structures and Reactions
Names and structures of monosaccharides
Reactions of monosaccharides
Glycoside formation
Disaccharides and polysaccharides

6. References. *[Provide 3 - 5 references on which this course is based and/or support it.]*

McMurray, J. *Organic Chemistry*, 5th Ed., 2000
Weeks, D. P. *Pushing Electrons*, 3rd Ed., 1998

Wade, L. G., Jr. *Organic Chemistry*, 5th Ed., 2002
Bruice, P. *Organic Chemistry*, 3rd Ed., 2000

7. List Faculty Qualified to Teach This Course.

Dr. Philip Hampton

8. Frequency.

a. Projected semesters to be offered: Fall _____ Spring __X___ Summer _____

9. New Resources Required.

None.

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

_____Philip Hampton_____1/8/03_____
Proposer of Course Date