

**THE COLLEGE OF THE BAHAMAS**



**COURSE PROPOSAL FORM**

**COURSE ABBREVIATION & NUMBER**

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**SCHOOL:** SCIENCES AND TECHNOLOGY

**DEPARTMENT:** CHEMISTRY

**COURSE TITLE:** ADVANCED ORGANIC SYNTHESIS

**COURSE DESCRIPTION FOR CATALOGUE (50 WORDS MAXIMUM):**

In this course students explore advanced organic synthetic procedures taken from the primary chemical literature. Students prepare synthetic protocols based on course and literature procedures.

**PURPOSE OF COURSE:**

University transfer  External Examination   
 College Diploma or Certificate  College Degree

**PRE-REQUISITE(S):** CHEM 330, CHLB 330, CHEM 331 or permission of the Chair/Instructor

**CO-REQUISITE(S):** NONE

**HOURS PER WEEK:** Lecture 2 Laboratory \_\_\_\_ Seminar 2 Other \_\_\_\_

**LAB FEE:** NONE

**SEMESTER HOUR CREDITS:** 3

**SEQUENTIAL COURSE(S):** NONE

**OTHER COB COURSES HAVING CONTENT OVERLAP:** NONE

**COURSE DEVELOPED ( X )/REVISED ( ) BY:**

(1) DANNY DAVIS Date: JUNE 22, 2005  
 (2) \_\_\_\_\_ Date: \_\_\_\_\_

**APPROVALS:** Department Head: \_\_\_\_\_ Date: \_\_\_\_\_

Chair of School: \_\_\_\_\_ Date: \_\_\_\_\_

Dean: \_\_\_\_\_ Date: \_\_\_\_\_

Academic Board: \_\_\_\_\_ Date: \_\_\_\_\_

**NOTE:**

- A detailed course description must be attached. This must include course objectives, list of topics covered, prescribed textbooks, reading list, method of assessment and external examinations which are prepared for in this course.
- The course description must be suitable for distribution to students.
- Only lecturers/instructors approved by The College will be allowed to teach this course.

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CHEMISTRY DEPARTMENT**

CHEM 430 – Advanced Organic Synthesis  
4 SEMESTER HOUR CREDITS

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**Course Description**

In this course students explore advanced organic synthetic procedures taken from the primary chemical literature. Students prepare synthetic protocols based on course and literature procedures.

**Specific Objectives**

Upon successful completion of this course, students will be able to

1. interpret primary research literature on organic syntheses;
2. formulate synthetic disconnections of complex organic molecules;
3. apply protecting group chemistry methodologies to organic syntheses; and
4. design multi-step organic synthetic sequences.

**Course Content**

1. Amino acid and Peptides
  - a. Classification
  - b. Configuration
  - c. Resolution
  - d. Peptide synthesis
2. Organic Catalysis
  - a. Nucleophilic catalysis
  - b. Acid catalysis
  - c. Base catalysis
  - d. Metal ion catalysis
  - e. Intramolecular catalysis
3. Mechanism of Coenzymes
  - a. Niacin
  - b. Flavin (vitamin B<sub>2</sub>)
  - c. Thiamine phosphate (vitamin B<sub>6</sub>)
  - d. Coenzyme B<sub>12</sub> (vitamin B<sub>12</sub>)
  - e. Tetrahydrofolate (folic acid)
  - f. Vitamin K (vitamin K)
4. Heterocyclic Compounds
  - a. Saturated heterocycles
  - b. Unsaturated heterocycles
5. Pericyclic Reactions
  - a. Molecular orbital and symmetry
  - b. Electrocyclic reactions
  - c. Cycloaddition reactions
  - d. Sigmatropic rearrangements

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**Assessment**

Class Presentations	40%
Mid-semester Test	20%
Homework	20%
<u>Project</u>	<u>20%</u>
Total	100%

**Required Texts**

Bruice, P. Y. (2004). *Organic chemistry* (4 ed). Upper Saddle River, N.J.: Pearson Education:

**Supplementary Readings**

American Chemical Society, & Royal Society of Chemistry (Great Britain). (1997). *Organic process research & development* (pp. v.). Washington, DC, Cambridge, UK: American Chemical Society; Royal Society of Chemistry.

Carey, F. A., & Sundberg, R. J. (2000). *Advanced organic chemistry* (4th ed.). New York: Kluwer Academic/Plenum Pub.

March, J. (2004). *Advanced organic chemistry: reactions, mechanisms, and structure*. New York: McGraw-Hill.

Miller, B. (2004). *Advanced organic chemistry: reactions and mechanisms* (2nd ed.). Upper Saddle River, N.J.: Pearson Education.

**Journal**

American Chemical Society. (1963). *Journal of medicinal chemistry* (pp. v.). [Easton, Pa.]: American Chemical Society.