COURSE SYLLABUS

1. **Program of Study** Bachelor of Science (Chemistry)
   Faculty International College, Mahidol University

2. **Course Code** ICCH 422
   Course Title Organic Synthesis

3. **Number of Credits** 4 (4-0-8) **(Lecture/Lab/Self-study)**

4. **Prerequisite** ICCH 222

5. **Type of Course** Elective major course

6. **Semester / Academic Year** Third trimester 2006-2007

7. **Conditions** Number of students between 20-30

8. **Course Description**:
   A detailed and mechanistic study of organic reactions and synthesis; the generation and synthetic uses of enolates; oxidation methods; reduction reactions via catalytic reduction and group III hydrides; halogenation.

9. **Course Objectives**:
   After successful completion of this course, students should be able to
   9.1 apply organic reactions to synthesis of simple to semi-complex organic molecules;
   9.2 identify the synthesis strategy of organic molecules by retrosynthesis analysis;
   9.3 apply knowledge to research.

10. Course Outline

Week	Topics	Hours			Instructor
		Lecture	Lab	Self-study	
1	Active hydrogens and their acidities	2	-	4	Dr. Tienthong Thongpuncha ng
2	Enolate formations	2	-	4	
3	Synthesis uses of enolates	4	-	8	
4	Olefin acylation	4	-	8	
5	Aromatic acylation	4	-	8	
6	Oxidation methodology	4	-	8	
7	Reduction methodology	4	-	8	

8	Halogenation of olefins	4	-	8	
9	Aromatic halogenation	4	-	8	
10	Electrophilic Aromatic syntheses	4	-	8	
11	Protection groups	4	-	8	
12	Protection groups	4	-	8	
	Total	44	-	88	

11. **Teaching Methods**:
    11.1 Lecturing
    11.2 Self-study
    11.3 Group discussion and presentation

12. **Teaching Media**:
    Transparencies, handouts and lecturing from boards.

13. **Measurement and Evaluation of Student Achievement**:
    Student achievement is measured and evaluated by
    13.1 the ability to apply organic reactions to synthesis of simple to semi-complex organic molecules;
    13.2 the ability to identify the synthesis strategy of organic molecules by retrosynthesis analysis;
    13.3 the ability to apply knowledge to research.
    Student's achievement will be graded according to the College and University standard using the symbols: A, B+, B, C+, C, D+, D and F. Students must attend at least 80% of the total class hours of this course.
    Assessment made from the set-forward criteria: student who gets 85% and above will have Grade A.
    A minimum of;

Midterm examination	40%
Final examination	50%
Quizzes	10%

14. **Course Evaluation**:
    14.1 Students' achievement as indicated in number 13 above.
    14.2 Students' satisfaction towards teaching and learning of the course using questionnaires.

15. **References**:

    Smith, M.B. and March, J. **Advanced Organic Chemistry; Reactions, Mechanisms and Structure**, 6th Edition, USA: Wiley-Interscience; 2007.

    Carey, F.A. and Sundberg, R.J. **Advanced Organic Chemistry; Part A Structure and mechanisms**, 4th Edition, USA: Plenum Publishers, 2000.

Carey, F.A. and Sundberg, R.J, **Advanced Organic Chemistry; Part B Reaction and Synthesis**, 4th Edition, USA: Plenum Publishers; 2000.

Lowry, T.H. and Schueller Richardson, K. **Mechanism and Theory in Organic Chemistry**, 3rd Edition, USA: Addison-Wesley; 1997.

16. Instructors:
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17. Course Coordinator:
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