

COURSE SYLLABUS

1. **Program of Study** Bachelor of Science (Chemistry)
Faculty International College, Mahidol University
2. **Course Code** ICCH 322
Course Title Advanced Organic Chemistry
3. **Number of Credits** 4(4-0-8) (Lecture/Lab/Self-study)
4. **Prerequisite** ICCH 222
5. **Type of Course** Required major course
6. **Semester / Academic Year** First trimester 2006-2007
7. **Conditions** Number of students between 20-30
8. **Course Description:**
Advance concepts of organic chemistry through physical chemistry and mechanistic approaches; stereochemistry; kinetics and equilibria thermodynamics; conformation and reactivity; molecular orbital theory and pericyclic reactions.
9. **Course Objectives:**
After successful completion of this course, students should be able to
 - 9.1 understand the concepts of organic chemistry through mechanistic and kinetic considerations;
 - 9.2 unite the understanding acquired in physical chemistry courses to the deeper understanding of organic chemistry;
 - 9.3 apply the understanding to predicting the outcome of organic reactions and the stereo and conformation configurations of the products.

10. Course Outline

| Week | Topics | Hours | | | Instructor |
|------|--|---------|-----|------------|---------------------------|
| | | Lecture | Lab | Self-study | |
| 1 | Bond energies, dipoles | 2 | - | 4 | Dr. Pakorn Bovonsombat |
| 2 | Molecular orbital theory | 4 | - | 8 | |
| 3 | Qualitative application of MO theory | 4 | - | 8 | |
| 4 | Pericyclic reactions | 4 | - | 8 | |
| 5 | Pericyclic reactions | 4 | - | 8 | |
| 6 | Pericyclic reactions | 4 | - | 8 | |
| 7 | Kinetics and equilibria thermodynamics | 4 | - | 8 | |

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|----|---|----|---|----|--|
| 8 | Kinetics and equilibria thermodynamics | 4 | - | 8 | |
| 9 | Conformation and reactivity | 4 | - | 8 | |
| 10 | Conformation and reactivity | 4 | - | 8 | |
| 11 | Conformation and reactivity | 4 | - | 8 | |
| 12 | Stereoelectronic effects | 2 | - | 4 | |
| | 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 in understanding the concepts of organic chemistry through mechanistic and kinetic considerations;
- 13.2 the ability to unite the understanding acquired in physical chemistry courses to the deeper understanding of organic chemistry;
- 13.3 the ability to apply the understanding to predicting the outcome of organic reactions and the stereo and conformation configurations of the products.

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.

- There will be homework assignments. The assignments will not have to be handed in or graded, but will be discussed periodically in class. Failure to do the homework or to discuss the assignments in class may affect the deliberation of the final Grade.
- A minimum of;

| | |
|---------------------|-----|
| Midterm examination | 40% |
| Final examination | 50% |
| Class participation | 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:

Dr. Pakorn Bovonsombat

17. Course Coordinator:

Dr. Pakorn Bovonsombat

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