

3131SCE

Advanced Organic Chemistry

Semester 1 - 2008

Academic Organisation:	School of Biomolecular and Physical Sciences
Faculty:	Science, Environment, Engineering and Technology
Credit point value:	10
Student Contribution Band:	Band 2
Course level:	Undergraduate
Campus/Location/Learning Mode:	Nathan / On Campus / In Person
Convenor/s:	Dr Chris Brown (Nathan)
Enrolment Restrictions:	Nil
This document was last updated:	25 January 2008

BRIEF COURSE DESCRIPTION

This course examines advanced concepts in organic chemistry, building on topics introduced in Second Year. Teaching material falls into three broad categories; the 3-D shape of organic molecules (stereochemistry), how reactions occur (reaction mechanisms) and a strategy for designing the synthesis of complex molecules (retrosynthetic analysis).

Prior-Assumed: 2115SCE Organic Chemistry

SECTION A – TEACHING, LEARNING AND ASSESSMENT

COURSE AIMS

The course builds upon the level 2 Organic Chemistry courses and is essential for further studies in organic chemistry at the postgraduate level. The course provides a good foundation for further studies in organic chemistry and biological and medicinal chemistry, and pharmaceutical chemistry. The purpose of the course is to develop a wider and deeper understanding of stereochemistry, reaction mechanisms, and modern organic synthesis.

LEARNING OUTCOMES

1. The purpose of this course is to motivate students to understand the fundamental concepts and methods of organic chemistry and apply these concepts and methods to related areas of science. Key concepts covered are the 3-D shape of organic molecules (stereochemistry), how reactions occur (reaction mechanisms) and a strategy for designing the synthesis of complex molecules (retrosynthetic analysis). Throughout a chemical context is placed on discussion of examples of reactions to highlight the relevance of knowledge of organic chemistry to other scientific disciplines. The course provides the necessary skills and knowledge base in the chemical sciences to proceed to higher level studies in the chemical and biological sciences.
2. The quizzes test the students' individual abilities to: recall information, understand chemical concepts, and apply this knowledge and understanding to problem solving. The quizzes allow students to gauge their abilities to cope with examination of material at a higher level than previously encountered. An emphasis is placed in the course on rapid feedback of assessment information during the semester.
3. The lecture/workshops provide opportunity for each student to discover weaknesses and strengths in study habits for examinations.
4. Assessment of laboratory exercises tests the students' ability to develop practical skills and to apply chemical knowledge gained from the lecture course to 'real situations'. Problem solving skills in an experimental context are developed in the laboratory sessions and report writing. Assessment of laboratory exercises is provided at stages through the semester.

CONTENT, ORGANISATION AND TEACHING STRATEGIES

Component 1:

- This course departs from the usual lecture approach and is based on self instruction. The semester is divided into six cycles. The backbone of each cycle is a reading programme taken from
 - *Organic Chemistry* by John McMurry
 - *Organic Synthesis, The Disconnection Approach* by Stuart Warren, 1991
 - Supplied Notes

Each two week cycle consists of a reading programme taken from the prescribed text or supplied notes, key-note lectures, problem lecture classes, (the ratio of lecture and problem lecture classes will depend on material of the cycle) and one quiz (30 minutes). The lectures will highlight the most important aspects of each cycle. The workshop will be for the whole class.

The material covered in the six fortnightly cycles is taken from a prescribed text and will be as follows:

Cycle 1	Stereochemistry, Diels Alder	McMurry Ch. 9, 14
Cycle 2	Carbocations	Supplied Notes
Cycle 3	Heterocycles, Pericyclic Reactions	McMurry, Ch 28, 30

Component 2: Laboratory component (24 hours, weeks 8-13)

The lectures deliver the key program material in a concise manner. The lectures impart and explain the course content.

The lecture/problem classes work through questions and approaches to dealing with the questions. The classes are devoted to further discussion of these problems and difficulties encountered in the course content. Problem classes are an opportunity for students to correct and fully understand problems done as homework.

The laboratory component is designed to illustrate course material and provide training in fundamental, experimental techniques. In the laboratory classes students learn basic experimental methodologies related to the material presented in the lecture course. Four written reports on the experimental results develop skills in scientific reporting.

Contact Summary

The course content is essential to the discipline and practice of organic chemistry. It provides the basis for an understanding of mechanistic concepts and for synthetic strategies. The teaching method departs from a traditional lecture course and is based on self-instruction. The semester is divided into fortnightly cycles. Each two week cycle consists of a reading programme taken from the prescribed text or supplied notes, key-note lectures, problem lecture classes, (the ratio of lecture and problem lecture classes will depend on material of the cycle) and one quiz (30 minutes). The laboratory component will consist of four hours a week for six weeks (or equivalent) of laboratory experiments. The laboratory component illustrates both of these aspects as well as providing training in fundamental, practical techniques.

It is compulsory to attend and participate in the laboratory classes.

It is compulsory to attend the quiz for each cycle (6 quizzes in total).

It is strongly suggested students attend lectures, and problem lecture classes.

CONTENT SUMMARY

This course examines advanced concepts in organic chemistry, building on topics introduced in Second Year. Teaching material falls into three broad categories; the 3-D shape of organic molecules (stereochemistry), how reactions occur (reaction mechanisms) and a strategy for designing the synthesis of complex molecules (retrosynthetic analysis).

ASSESSMENT

Summary of Assessment

Assessment includes continuous assessment of laboratory performance and practical reports (20%) plus six quizzes (80%) each of 30 minutes duration.

Assessment of laboratory performance is necessary to motivate students to develop practical skills. An average of 50% on the six quizzes and a pass on the laboratory component guarantees a pass on the course.

Item	Length	Worth	Focus	Due
Continuous Assessment of laboratory performance & practical reports	6 x 4 hours	20%	Individual	Weeks 8-15
Six Quizzes	30 minutes	80%	Individual	Throughout semester

Item	Assessment Task	Length	Weighting	Total Marks	Relevant Learning Outcomes	Due Day and Time
1.	Quiz cycle 1	30 min	13.3%	100	1, 2, 3.	Week 2, as advised at the course start
2.	Quiz cycle 2	30 min	13.3%	100	1, 2, 3.	Week 4, as advised at the course start
3.	Quiz cycle 3	30 min	13.3%	100	1, 2, 3.	Week 6, as advised at the course start
4.	Quiz cycle 4	30 min	13.3%	100	1, 2, 3.	Week 9, as advised at the course start
5	Quiz cycle 5	30 min	13.3%	100	1, 2, 3.	Week 11, as advised at the course start
6	Quiz cycle 6	30 min	13.3%	100	1, 2, 3.	Week 13, as advised at the course start
7	Laboratory Reports		20%		1, 4	As advised in laboratory manual

Assessment Details

Assessment is spread throughout the semester so students can 'digest' the material in manageable portions. Each Quiz will examine the material in the cycle. The examinations test the students' individual abilities to: recall information, understand chemical concepts, and apply this knowledge and understanding to problem solving. An emphasis is placed in the course on rapid feedback of assessment information during the semester.

Laboratory reports will assess an understanding of the material covered by each of the four experiments. Assessment of laboratory exercises tests the students ability to develop practical skills and to apply chemical knowledge gained from the lecture course to 'real situations'. Assessment of laboratory exercises is provided continuously through the period of the class.

Information to students will be provided on Learning@Griffith in Week 1 and throughout semester.

Return of Assessment Items

Quizzes and laboratory reports will be returned during lectures or the student post-boxes, level 1, Science 2 at the end of semester.

Information regarding the timing of the return of these items to students will be provided on Learning@Griffith and in lectures.

Notification of Availability of Feedback on Assessment

Each quiz will be marked as soon as possible after the quiz (normally 2-4 days).

The laboratory reports will be returned as soon as possible (normally 1 week).

The final grade for the course will be released within normal university procedure.

GRADUATE SKILLS

Graduate Skills	Taught	Practised	Assessed
Effective communication (written)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Effective communication (oral)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Effective communication (interpersonal)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Information literacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem solving	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Critical evaluation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Work autonomously	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Work in teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Creativity and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ethical behaviour in social / professional / work environments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Responsible, effective citizenship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Professional Skills

A knowledge base in the chemical sciences	X	X	X
Selected Experimental techniques in chemical science	X	X	X

TEACHING TEAM

Course Convenor

Convenor Details	Nathan
Campus Convenor	Dr Chris Brown
Email	c.l.brown@griffith.edu.au
Office Location	N25, Room 1.17
Phone	3735 7293
Fax	3735 7656
Consultation times	See Learning@Griffith

Additional teaching team members

Lecturing Staff:

D. T. ... A/D. ...

Laboratory Demonstrators:

Dr Chris Brown/Dr

COURSE COMMUNICATIONS

Information will be posted at the Learning@Griffith site according to the topics being delivered and announced in lectures.

Communication with the Course Convenor and/or any other member of the teaching team is best done either at class time or by email.

TEXTS AND SUPPORTING MATERIALS

Required textbooks:

McMurry, J., Organic Chemistry, Brooks/Cole, 2000, 6th (or 7) edition.

Required Supporting Material

Laboratory Manual – Advanced Organic Chemistry 2007
Available at the Science 2 shop level -1 in week 1.

Other Supporting Material

Stuart Warren, "Organic Synthesis, The Disconnection Approach" 1991

REFERENCE BOOKS

- 1 B.A. Marples, "Elementary Organic Stereochemistry and Conformational Analysis", Royal Society of Chemistry, Monograph for Teachers No. 34 (1981).
- 2 Jerry March, "Advanced Organic Chemistry", Wiley 1992.
- 3 D.H.R. Barton, "Comprehensive Organic Chemistry", Pergamon, 1979.
- 4 Mackie & Smith, "Guidebook to Organic Synthesis", 2nd. Ed., Longman, 1990.
- 5 Harris & Wamser, "Fundamentals of Organic Reaction Mechanisms", Wiley, 1976.
- 6 Carey & Sundberg, "Advanced Organic Chemistry", 3rd Ed., Parts A & B, Plenum, 1990.
- 7 "Comprehensive Organic Synthesis", ed. B.Trost and I.Fleming, Pergamon, 1991.
- 8 M.B. Smith, "Organic Synthesis", McGraw-Hill, 1994.
- 9 "Encyclopedia of Reagents for Organic Synthesis", ed. L.A. Paquette, Wiley, 1995.

Dependent on the topic, other supporting material will be available through lectures, the Science 2 shop and Learning@Griffith.

Students must have access to Learning@Griffith University.

SECTION B – ADDITIONAL COURSE INFORMATION

"Students should refer to the Learning@Griffith website for further information about this course"

SECTION C – KEY UNIVERSITY INFORMATION

ACADEMIC MISCONDUCT

Students must conduct their studies at the University honestly, ethically and in accordance with accepted standards of academic conduct. Any form of academic conduct that is contrary to these standards is academic misconduct and is unacceptable.

Some students engage deliberately in academic misconduct, with intent to deceive. This conscious, pre-mediated form of cheating is one of the worst forms of fraudulent academic behaviour, for which the University has zero tolerance and for which penalties, including exclusion from the University, will be applied.

However the University recognises many students commit academic misconduct without intent to deceive. These students may be required to undertake additional educational activities to remediate their behaviour.

Specifically it is academic misconduct for a student to:

- **Cheat in examinations and tests** by communicating, or attempting to communicate, with a fellow individual who is neither an invigilator or member of staff; by copying, or attempting to copy from a fellow candidate; attempting to introduce or consult during the examination, any unauthorised printed or written material, or electronic calculating or information storage device; or mobile phones or other communication device, or impersonates another.
- **Fabricate results** by claiming to have carried out tests, experiments or observations that have not taken place or by presenting results not supported by the evidence with the object of obtaining an unfair advantage.
- **Misrepresent themselves** by presenting an untrue statement or not disclosing where there is a duty to disclose in order to create a false appearance or identity.
- **Plagiarise** by representing the work of another as their own original work, without appropriate acknowledgement of the author or the source. This category of cheating includes the following:
 1. collusion, where a piece of work prepared by a group is represented as if it were the student's own;
 1. acquiring or commissioning a piece of work, which is not his/her own and representing it as if it were, by
 - purchasing a paper from a commercial service, including internet sites, whether pre-written or specially prepared for the student concerned
 - submitting a paper written by another person, either by a fellow student or a person who is not a member of the University;
 2. duplication of the same or almost identical work for more than one assessment item;
 3. copying ideas, concepts, research data, images, sounds or text;
 4. paraphrasing a paper from a source text, whether in manuscript, printed or electronic form, without appropriate acknowledgement;
 5. cutting or pasting statements from multiple sources or piecing together work of others and representing them as original work;
 6. submitting, as one own work, all or part of another student's work, even with the student's knowledge or consent.

A student who willingly assists another student to plagiarise (for example by willingly giving them their own work to copy from) is also breaching academic integrity, and may be subject to disciplinary action.

Visit the University's Institutional Framework for Promoting Academic Integrity Among Students for further details.

PLAGIARISM DETECTION SOFTWARE

From semester 2, 2007 the University has been piloting the use of plagiarism detection software. Students

HEALTH AND SAFETY

Griffith University is committed to providing a safe work and study environment, however all students, staff and visitors have an obligation to ensure the safety of themselves and those whose safety may be affected by their actions. Staff in control of learning activities will ensure as far as reasonably practical, that those activities are safe and that all safety obligations are being met. Students are required to comply with all safety instructions and are requested to report safety concerns to the University.

General health and safety information can be obtained from http://www.griffith.edu.au/hrm/health_and_safety/

Information about Laboratory safety can be obtained from http://www.griffith.edu.au/ots/secure/health/content_labsafety.html

KEY STUDENT-RELATED POLICIES

All University policy documents are accessible to students via the University's Policy Library website at: www.griffith.edu.au/policylibrary. Links to key policy documents are included below for easy reference:

[Student Charter](#)

[Academic Standing, Progression and Exclusion Policy](#)

[Student Administration Policy](#)

[Policy on Student Grievances and Appeals](#)

[Assessment Policy](#)

[Examinations Timetabling Policy and Procedures](#)

[Academic Calendar](#)

[Guideline on Student E-Mail](#)

[Health and Safety Policy](#)

UNIVERSITY SUPPORT RESOURCES

The University provides many facilities and support services to assist students in their studies. Links to information about University support resources available to students are included below for easy reference:

[Learning Centres](#) - the University provides access to common use computing facilities for educational purposes. For details visit www.griffith.edu.au/cuse

[Learning@Griffith](#) - there is a dedicated website for this course via the Learning@Griffith student portal.

[Student Services](#) facilitate student access to and success at their academic studies. Student Services includes: Careers and Employment Service; Chaplaincy; Counselling Service; Health Service; Student Equity Services (incorporating the Disabilities Service); and the Welfare Office.

[Learning Services](#) within the Division of Information Services provides learning support in three skill areas: computing skills; library skills; and academic skills. The study skills resources on the website include self-help tasks focusing on critical thinking, exam skills, note taking, preparing presentations, referencing, writing, proof reading, and time management.
