Science

CHEM 100 : Molecules that Changed the World (15 POINTS)

Course Prescription

The impact of chemistry on the modern world will be explored by focusing on the stories of specific molecules, including penicillin, DDT and nylon. Their discovery, the underlying chemical principles that explain their behaviour, their impact on our lives including social and scientific issues that arise from their use, and their likely impact on the future will be investigated. No formal prerequisite, but the course assumes a science background at Year 11 or higher.

Course Overview

CHEM 100/100G is a general education course offered during the summer time that examines how particular molecules or chemical discoveries have had a dramatic impact on society. This course has no formal prerequisite and restrictions, but the course assumes a science background at Year 11 or higher. Note that this course is also not intended as background for other chemistry courses.

The course involves 12~15 two hour lectures, covering four or five different topics. Each lecturer will provide you with notes covering their topic, including details of learning outcomes. Note that the course requires completion of assignments for all topics.

Course Requirements

No pre-requisites or restrictions

Capabilities Developed in this Course

Capability 1: Disciplinary Knowledge and Practice
Capability 2: Critical Thinking
Capability 4: Communication and Engagement
Capability 6: Social and Environmental Responsibilities

Graduate Profile: Bachelor of Science

Learning Outcomes

By the end of this course, students will be able to:

1. Give examples of important chemicals that have affected modern society and are integral to modern civilisation and explain their importance (Capability 6)
2. Explain the economical, social and historical context of selected molecules. (Capability 2 and 4)
3. Use appropriate scientific language to discuss chemical phenomena . (Capability 1 and 4)
4. Demonstrate a broad understanding of medicinal chemistry and natural product chemistry, including the role they play in drug discovery both in a contemporary and historical context. (Capability 1 and 6)
5. Demonstrate a broad understanding of materials chemistry and the social implications of developments in this area. (Capability 1 and 6)

Assessments

Assessment Type	Percentage	Classification
Assignments (4)	40%	Individual Coursework
Final Exam	60%	Individual Examination
2 types	100%	

Assessment Type	Learning Outcome Addressed				
	1	2	3	4	5
Assignments (4)	✔	✔	✔	✔	✔
Final Exam	✔	✔	✔	✔	✔

Key Topics

In 2020 the four topics explored will be as follows.

Gold: you will discuss the unique physical and chemical properties of gold, how these have influenced historical events and their present consequences. You will also see how the special properties of gold underlie their applications in a range of modern and historic uses and describe the features of some modern uses of gold.

Nylon: you will be introduced key terminology relevant to polymer-based materials and discuss the properties of plastics. You will explore the historical context of nylon development, and the social implications of both nylon specifically, and plastics more broadly.

Alcohol: you will be introduced the key chemistry terminology relating to alcohol molecules. You will discuss the effect of alcohol on the human body, including short term effects (e.g. which receptors are involved) and long term effect (e.g. addiction).

Penicillin: you will develop an understanding of the scientific background relevant to the mechanism of action of penicillin including definitions of key terms. You will see how this fits in to processes of drug discovery and natural product chemistry more broadly.

Learning Resources

Recommended reading:

Napoleon's buttons : 17 molecules that changed history by Penny Le Couteur

PUBLISHER : New York : Jeremy P. Tarcher/Penguin 2004.

ISBN: 1585423319

ISBN: 9781585423316

Special Requirements

No Special Requirement

Workload Expectations

This course is a standard 15 point course but offered in Summer school. There will be 4 lectures per week, each lecture is 2 hrs long. Students are expected to spend 20 hours per week involved in each 15 point course that they are enrolled in.

For this course, you can expect 24-30 hours of lectures, 10 hours of reading and study of the content and 12 hours of work on assignments.

Digital Resources

Course materials are made available in a learning and collaboration tool called Canvas which also includes reading lists and lecture recordings (where available).

Please remember that the recording of any class on a personal device requires the permission of the instructor.

Copyright

Academic Integrity

The University of Auckland will not tolerate cheating, or assisting others to cheat, and views cheating in coursework as a serious academic offence. The work that a student submits for grading must be the student's own work, reflecting their learning. Where work from other sources is used, it must be properly acknowledged and referenced. This requirement also applies to sources on the internet. A student's assessed work may be reviewed against online source material using computerised detection mechanisms.

Inclusive Learning

All students are asked to discuss any impairment related requirements privately, face to face and/or in written form with the course coordinator, lecturer or tutor.

Student Disability Services also provides support for students with a wide range of impairments, both visible and invisible, to succeed and excel at the University. For more information and contact details, please visit the Student Disability Services' website at http://disability.auckland.ac.nz

Special Circumstances

If your ability to complete assessed coursework is affected by illness or other personal circumstances outside of your control, contact a member of teaching staff as soon as possible before the assessment is due.

If your personal circumstances significantly affect your performance, or preparation, for an exam or eligible written test, refer to the University's aegrotat or compassionate consideration page: https://www.auckland.ac.nz/en/students/academic-information/exams-and-final-results/during-exams/aegrotat-and-compassionate-consideration.html.

This should be done as soon as possible and no later than seven days after the affected test or exam date.

Student Feedback

During the course Class Representatives in each class can take feedback to the staff responsible for the course and staff-student consultative committees.

At the end of the course students will be invited to give feedback on the course and teaching through a tool called SET or Qualtrics. The lecturers and course co-ordinators will consider all feedback.

Your feedback helps to improve the course and its delivery for all students.

Student Charter and Responsibilities

The Student Charter assumes and acknowledges that students are active participants in the learning process and that they have responsibilities to the institution and the international community of scholars. The University expects that students will act at all times in a way that demonstrates respect for the rights of other students and staff so that the learning environment is both safe and productive. For further information visit Student Charter (https://www.auckland.ac.nz/en/students/forms-policies-and-guidelines/student-policies-and-guidelines/student-charter.html).

Disclaimer

Elements of this outline may be subject to change. The latest information about the course will be available for enrolled students in Canvas.