Annexe A: New/Revised Course Content in OBTL+ Format

Course Overview

The sections shown on this interface are based on the templates UG OBTL+ or PG OBTL+
If you are revising/duplicating an existing course and do not see the pre-filled contents you expect in the subsequent sections e.g. Course Aims, Intended Learning Outcomes etc. please refer to Data Transformation Status for more information.

Expected Implementation in Academic Year	AY2025-2026
Semester/Trimester/Others (specify approx. Start/End date)	Semester 2
Course Author * Faculty proposing/revising the course	Loh Teck Peng
Course Author Email	teckpeng@ntu.edu.sg
Course Title	CURRENT TOPICS IN SYNTHETIC ORGANIC CHEMISTRY
Course Code	CM4032
Academic Units	3
Contact Hours	39
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	CM3031 (Organic Reaction Mechanisms and Synthesis) or by permission
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

This course provides an in-depth exploration of cutting-edge developments in organic synthesis, equipping you with the advanced knowledge and skills necessary for careers in research, the pharmaceutical sector, and the broader chemical industry. You will examine modern synthetic methodologies, reaction mechanisms, and the practical applications of organic chemistry, gaining a comprehensive understanding of complex molecule construction. Designed for students with a strong background in organic chemistry, the course lays a solid foundation for further academic research or professional advancement. In addition, you will refine your scientific communication skills through structured technical writing and formal presentations—essential competencies for success in both academic and industrial environments.

Course's Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, you (student) would be able to:

ILO 1	Explain the fundamental principles and scope of organic synthesis.
ILO 2	Identify and analyze key reactions in organic chemistry.
ILO 3	Design and propose synthetic pathways for target molecules.
ILO 4	Analyze contemporary topics in organic chemistry (e.g., green chemistry) and evaluate their practical applications.
ILO 5	Effectively communicate complex chemical concepts in both written and oral formats for diverse audiences, including non-experts.

Course Content

This course explores key topics in organic synthesis, including:

1. The significance of organic synthesis
2. Nobel Prize-winning discoveries
3. Green chemistry principles
4. Development of novel synthetic methods
5. Asymmetric synthesis strategies
6. Total synthesis of natural products
7. Chemical biology
8. Other emerging trends in organic synthesis

Reading and References (if applicable)

For the latest advancements, students are encouraged to routinely consult leading journals such as Nature, Science, JACS, ACIE, etc.

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Introduction to current organic synthesis	1-5		In-person	Lecture/guest lecture/assignment
2	Natural product synthesis	1-5		In-person	Lecture/guest lecture/assignment
3	Radical reactions	1-5		In-person	Lecture/guest lecture/assignment
4	Green solvents	1-5		In-person	Lecture/guest lecture/assignment
5	Biomass and Ionic Liquids	1-5		In-person	Lecture/guest lecture/assignment
6	Diels-Alder reactions	1-5		In-person	Lecture/guest lecture/assignment
7	Literature reviews	1-5		In-person	Lecture/guest lecture/assignment
8	Modern topics in organic chemistry	1-5		In-person	Lecture/guest lecture/assignment
9	Literature reviews	1-5		In-person	Lecture/guest lecture/assignment

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
10	Literature reviews	1-5		In-person	Lecture/guest lecture/assignment
11	Modern topics in organic chemistry	1-5		In-person	Lecture/guest lecture/assignment
12	Modern topics in organic chemistry	1-5		In-person	Lecture/guest lecture/assignment
13	Modern topics in organic chemistry	1-5		In-person	Lecture/guest lecture/assignment

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	Lectures will establish a strong foundation in organic synthesis principles (ILO 1) and key reaction mechanisms (ILO 2), enabling you to perform effective retrosynthetic analysis of complex molecules (ILO 3). Guest lecturers, experts in their respective fields, will provide insights into contemporary advancements in organic synthesis (ILO 4), enriching your understanding of modern developments in the field.
Technical Writing Assignments	You will develop critical scientific communication skills by writing structured reports on synthetic strategies, reaction mechanisms, and total synthesis approaches, enhancing your ability to explain complex chemical concepts in written form (ILO 5).
Student Presentations	Presenting research findings and synthetic proposals will develop your ability to extract key insights from scientific literature and communicate them concisely within a limited timeframe, enhancing your oral communication skills for both expert and non-expert audiences (ILO 5).

Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Team/Individual	Rubrics	Level of Understanding
1	Continuous Assessment (CA): Assignment(Lecture summary)	1-5	Competence and creativity	30	Individual	Analytic	Multistructural
2	Continuous Assessment (CA): Assignment(Literature Review)	1-5	Competence and creativity	10	Individual	Analytic	Relational
3	Continuous Assessment (CA): Test/Quiz(Take-home test)	1-5	Competence and creativity	30	Individual	Holistic	Multistructural
4	Continuous Assessment (CA): Presentation()	1-5	Competence and creativity	30	Individual	Holistic	Extended Abstract

Description of Assessment Components (if applicable)

Formative Feedback

You will receive oral feedback on presentations and general group feedback on key strengths and common areas for improvement in assignments. Students are encouraged to proactively seek individual feedback as needed.

NTU Graduate Attributes/Competency Mapping

This course intends to develop the following graduate attributes and competencies (maximum 5 most relevant)

Attributes/Competency	Level
Information Literacy	Advanced
Critical Thinking	Advanced
Embrace Challenge	Advanced

Course Policy

Policy (Academic Integrity)

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values. As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. On the use of technological tools (such as Generative AI tools), different courses / assignments have different intended learning outcomes. Students should refer to the specific assignment instructions on their use and requirements and/or consult your instructors on how you can use these tools to help your learning. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Policy (General)

You are responsible for regularly checking announcements and ensuring all assignments are submitted by their due dates.

Policy (Absenteeism)

You are expected to make up for any missed learning due to absences. Absences during assessments without a valid reason will result in a grade penalty. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. Supporting documents must be submitted to the school for verification.

Policy (Others, if applicable)

Diversity and Inclusion Policy

Integrating a diverse set of experiences is important for a more comprehensive understanding of science and engineering.

It is our goal to create an inclusive and collaborative learning environment that supports a diversity of perspectives and learning experiences. That honours your identities; including ethnicity, gender, socioeconomic status, sexual orientation, religion or ability.

To help accomplish this:
- If you are neuroatypical or neurodiverse, have dyslexia or ADHD (for example), or have a social anxiety disorder or social phobia;
- If you feel your performance in the course is being impacted by your experiences outside of class;
- If something was said in the course (by anyone, including instructor/supervisor) that made you uncomfortable.

Please e-mail to your Associate Chair (Students & Continuing Education) at ac-ccebstud@ntu.edu.sg about how we can help facilitate your learning experience.

As a participant in course discussions you should also strive to honour the diversity of your classmates. You can do this by; using preferred pronouns and names; being respectful of others opinions and actively making sure all voices are being heard; and refraining from the use of derogatory or demeaning speech or actions.

All members of the course are expected to strictly adhere to the student code of conduct (https://www.ntu.edu.sg/life-at-ntu/student-life/student-conduct) . If you witness something that goes against this or have any other concerns, please speak to your instructors or a faculty member.

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