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 1
Course Author * Faculty proposing/revising the course	Lau Wai Man
Course Author Email	wmlau@ntu.edu.sg
Course Title	Intro to Chemistry, Chem Eng & Biomed Eng
Course Code	CB1102
Academic Units	1
Contact Hours	13
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

This course aims to provide students with background of industries in Singapore relating to Chemistry, Chemical Engineering and Biomedical Engineering, as well as the career planning and options after graduation. Industry speakers and CCEB alumni will share information on industry landscape in Singapore, internship and career path preparation and personal career journey related to the three degree programmes.

Course's Intended Learning Outcomes (ILOs)

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

ILO 1	Recognize the wide range of opportunities for chemists, chemical engineers and bioengineers.
ILO 2	Describe the different roles in a particular industry for chemists, chemical engineers and bioengineers.
ILO 3	Identify the industries and roles of personal interests.
ILO 4	Locate the resources available for career planning and development.

Course Content

Key topics covered

1. Career planning and development
2. Entrepreneurship
3. Graduate studies
4. Local industries for chemists, chemical engineers and bioengineers

Reading and References (if applicable)

Supplementary reading materials will be provided before the lessons

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Overview	1, 2	Nil	In-person	Lecture
2	Career paths as chemists, chemical engineers and bioengineers	1, 2, 3, 4	Nil	In-person	Lecture
3	Career planning – graduate attributes and internships	3, 4	Nil	In-person	Seminar
4	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
5	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
6	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
7	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
8	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
9	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
10	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
11	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
12	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar
13	Sharing from industry / alumni	1, 2, 3	Nil	In-person	Seminar

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lecture	Industry speakers and CCEB alumni will share information on industry landscape in Singapore, internship and career path preparation and personal career journey related to chemistry, chemical engineering and biomedical engineering. In class question and answer dialogue session(s) will be conducted to answer specific questions raised during the sharing.

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): Test/Quiz(Course Assessment (Quiz))	1, 2, 3, 4	I	60	Individual	Holistic	Relational
2	Continuous Assessment (CA): Assignment(Video Presentation)	1, 2, 3	I	40	Individual	Holistic	Relational

Description of Assessment Components (if applicable)

In-class quiz will be administered in each session. One multiple choice question relating to the topic shared in the session will be asked. Each student is allowed to miss 2 in-class quizzes throughout the semester without affecting the grades.

A video presentation is to be made by the end of the semester on a particular role you want to do after graduation. Describe why you are interested in that role, what kind of skills the role would need and how can you achieve the skills throughout your university study.

Formative Feedback

In class question and answer dialogue session will be conducted to clear doubts.

NTU Graduate Attributes/Competency Mapping

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

Attributes/Competency	Level
Adaptability	Basic
Communication	Basic
Creative Thinking	Basic
Curiosity	Basic
Learning Agility	Basic

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)

Students are expected to take all scheduled assignments by due dates. Students are expected to take responsibility to follow up with course notes, assignments and course related announcements. Students are expected to participate in all in class discussions and activities.

Policy (Absenteeism)

Continuous assessments make up a significant portion of students' course grade. Absence from continuous assessments without officially approved leave will result in no marks and affect students' overall course grade.

Policy (Others, if applicable)

Continuous assessments: Students are required to attend all continuous assessments.

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Last Updated By: Lai Ru Ying

Appendix 1: Assessment Criteria

Criteria	Exceed Expectations (75-100%)	Meet Expectations (50-74%)	Meet Baseline Expectations (25-49%)	Below Expectations (0-24%)	Points
Content of Presentation	Exhibits deep understanding of different job roles, responsibilities and skills needed for chemists, chemical engineers or bioengineers in a particular industry. Content of presentation is concise, coherent, well-organized and well-structured.	Exhibits acceptable understanding of different job roles, responsibilities and skills needed for chemists, chemical engineers or bioengineers in a particular industry. Content of presentation is concise, coherent, and organized.	Exhibits narrow understanding of different job roles, responsibilities and skills needed for chemists, chemical engineers or bioengineers in a particular industry. Content of presentation is organized but with noticeable gaps in flow and clarity.	Do not exhibit any understanding of different job roles, responsibilities and skills needed for chemists, chemical engineers or bioengineers in a particular industry. Content of presentation Lacks clear structure, making it difficult to follow.	70
Presentationskills	Confident, engaging delivery with appropriate tone, eye contact, and body language.	Good delivery with some engagement and appropriate tone.	Some hesitation or monotone delivery, limited engagement.	Lacks confidence, poor engagement, and unclear speech.	30

Mapping of Course ILOs to EAB Graduate Attributes

Course Code & Title	CB1102 Intro to Chemistry, Chem Eng & Biomed Eng
Course Type	Core

Overview											
(a)		(b)		(c)		(d)		(e)	◐	(f)	
(g)		(h)		(i)	◐	(j)		(k)	◐		

Legend:

●	Fully consistent (contributes to more than 75% of Student Learning Outcome)
◐	Partially consistent (contributes to about 50% of Student Learning Outcome)
O	Weakly consistent (contributes to about 25% of Student Learning Outcome)
Blank	Not related to Student Learning Outcome

Course ILOs		**EAB Graduate Attributes**
1)	Recognize the wide range of opportunities for chemists, chemical engineers and bioengineers.	e, k
2)	Describe the different roles in a particular industry for chemists, chemical engineers and bioengineers.	i
3)	Identify the industries and roles of personal interests.	e, k
4)	Locate the resources available for career planning and development.	e, k
5)		
6)		
7)		
8)		
9)		
10)		

EAB GRADUATE ATTRIBUTES

a) **Engineering Knowledge**: Apply the knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialisation as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

b) **Problem Analysis**: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences with holistic considerations for sustainable development. (WK1 to WK4)

c) **Design / Development of Solutions**: Design creative solutions for complex engineering problems and design systems, components or processes that meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required. (WK5)

d) **Investigation**: Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e) **Modern Tool Usage**: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering problems, with an understanding of the limitations. (WK2 and WK6)

f) **The Engineer and the World**: When solving complex engineering problems, analyse and evaluate sustainable development impacts to: society, the economy, sustainability, health and safety, legal frameworks and the environment (WK1, WK5, and WK7).

g) **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (WK9).

h) **Individual and Collaborative Team Work**: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multidisciplinary, face-to-face, remote and distributed settings (WK9).

i) **Communication**: Communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions, taking into account cultural, language, and learning differences.

j) **Project Management and Finance**: Demonstrate knowledge and understanding of engineering management principles and economic decision-making, and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

k) **Life-long Learning**: Recognise the need for, and have the preparation and ability to (i) engage in independent and life-long learning, and (ii) adapt to new and emerging technologies, and (iii) think critically, in the broadest context of technological change (WK8).

KNOWLEDGE PROFILE

WK1 A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2 Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3 A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4 Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

WK5 Knowledge including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts that supports engineering design and operations in a practice area.

WK6 Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7 Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline such as the professional responsibility of an engineer to public safety and sustainable development.

WK8 Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9 Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc with mutual understanding and respect, and of inclusive attitudes.

Reference: EAB Accreditation Manual