

## 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	AY24_25 S1
Semester/Trimester/Others (specify approx. Start/End date)	Semester 1
Course Author * Faculty proposing/revising the course	Chen Wei Ning, William
Course Author Email	wnchen@ntu.edu.sg
Course Title	Food Industry Seminar Series
Course Code	CH5221
Academic Units	3
Contact Hours	39
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 seminar course will introduce you to the Food Industry in Singapore, Asia and beyond. Prominent speakers from various Food MNCs, local SMEs, and regulatory bodies (SFA and/or WHO) will be invited to present every week on various topics and food issues. This will also give you a valuable opportunity to interact personally with food industries and have a deeper understanding of the food policies and issues around the world.

## Course's Intended Learning Outcomes (ILOs)

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

ILO 1	discuss global food issues from the perspectives food MNCs and food regulatory bodies from around the world.
ILO 2	identify and recognize important food issues such as:  a. Food Security - Smart technology for primary production - Enhance process in house capabilities - Ensure food is safe for consumption  b. Food Sustainability - Novel technology for prolonged food shelf life - Nutrition profiling for healthy lifestyle  c. Food Waste Management - Food waste conversion to food ingredients - Food waste utilization for wider applications

## Course Content

This course aims to raise your awareness of the real world challenges in food industry around the world and in Singapore. Subjects such as food security, food sustainability and food waste management will be the main focus for every week's seminar.

A convergence of factors has made food security one of the most important global issues. An increasing population wants a more varied diet, but is trying to grow more food on less land with limited access to water, all the time facing increased costs for fertiliser, and fuel for storage and transport.

Even after food is grown, stored and transported, serious losses can occur, and in developing nations where 'plentiful' food is wasted. A review of food waste in the US calculated that around 20% of the amount available to consume, was lost from retailing onwards. This translate to 20% of the land, water, labour, seed, pesticide and fertiliser are wasted in the process and thus this is also a financial and environmental loss too.

In view of the growing world population and thus a growing demand in food, most of the food produced today is reflective of an unsustainable food system. This food is dependent on foreign oil, is destroying soil, contaminates water, has caused disease outbreaks, and may be robbing our future generations of the ability to grow food at all.

Specific content includes (note may change over time):

### 1. Food Security

- Smart technology for primary production
- Enhance process in house capabilities
- Ensure food is safe for consumption

### 2. Food Sustainability

- Novel technology for prolonged food shelf life
- Nutrition profiling for healthy lifestyle

### 3. Food Waste Management

- Food waste conversion to food ingredients
- Food waste utilization for wider applications

## Reading and References (if applicable)

Reference to Speakers 1 to 6 notes and case studies

## Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Speaker 1: Presentation on Food Security	1, 2a	Reference to Speaker 1's case study and notes		
2	Speaker 1: Presentation on Food Security	1, 2a	Reference to Speaker 1's case study and notes		
3	Speaker 2: Presentation on Food Security	1, 2a	Reference to Speaker 2's case study and notes		
4	Speaker 2: Presentation on Food Security	1, 2a	Reference to Speaker 2's case study and notes		
5	Speaker 3: Presentation on Food Sustainability	1, 2b	Reference to Speaker 3's case study and notes		
6	Speaker 3: Presentation on Food Sustainability	1, 2b	Reference to Speaker 3's case study and notes		
7	Mid-term Project Presentations	1, 2a	Reference to Speaker 1 to 3's case study and notes		
8	Speaker 4: Presentation on Food Sustainability	1, 2b	Reference to Speaker 4's case study and notes		
9	Speaker 5: Presentation on Food Waste Management	1, 2c	Reference to Speaker 5's case study and notes		
10	Speaker 5: Presentation on Food Waste Management	1, 2c	Reference to Speaker 5's case study and notes		

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
11	Speaker 6: Presentation on Food Waste Management	1, 2c	Reference to Speaker 6's case study and notes		
12	Speaker 6: Presentation on Food Waste Management	1, 2c	Reference to Speaker 6's case study and notes		
13	Final Project Presentation	1, 2b, 2	Reference to Speaker 4 to 6's case study and note		

## Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lecture	Industry speakers will be sharing with you on real world challenges in food industry around the world and in Singapore. Students have the opportunity to participate in class and discuss real case studies. Through project discussions and class participations, they have deeper understanding of the global food issues.

# 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(Weekly Essays/ Assignments)	1, 2, 3	a, b, i	20	Individual	Analytic	Multistructural
2	Continuous Assessment (CA): Project(Mid-term Project/Presentation)	1, 2	a,b,i	40	Team	Analytic	Multistructural
3	Continuous Assessment (CA): Project(Final Project/Presentation)	3	a,b,i	40	Team	Analytic	Multistructural

Description of Assessment Components (if applicable)

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Formative Feedback

Weekly Assignments and presentation performances will be discussed in class.
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## 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
Collaboration	Intermediate
Creative Thinking	Intermediate
Global Perspective	Intermediate
Problem Solving	Intermediate

# 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)

General: You are expected to complete all online activities and take all scheduled assignments and tests by due dates. You are expected to take responsibility to follow up with course notes, assignments and course related announcements. You are expected to participate in all tutorial discussions and activities.

## Policy (Absenteeism)

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

Attendance of the mid-term exam by all students is expected. Only students proven medically unfit may be excused from the mid-term exam. In this case, there will be no make-up exam. Mark weighting will be transferred to the final exam.

## Policy (Others, if applicable)

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

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Last Updated By: Chen Wei Ning, William (Prof)

## Appendix 1: Assessment Criteria for Weekly Assignments

<u>Criteria</u>	<u>Does Not Meet Expectation (&lt;40%)</u>	<u>Below Expectation (40% to 49%)</u>	<u>Meet Expectation (50%-79%)</u>	<u>Exceed Expectation (&gt;80%)</u>
<b>Report – Introduction on Background (5%)</b>	No introduction of the background	No clear introduction of the background and objectives of the report is missing	Introduction states the background and preview the objectives of the report	Introduction states the background and provided clear and well defined objectives of the report
<b>Report – Approaches or Mitigation Measures (20%)</b>	The approaches described are either not suited and not feasible	The approaches identified are appropriate but details are largely incomplete	The approaches identified are appropriate but some details are missing	The approaches identified are well defined and provides good justifications on how to tackle the problem.
<b>Report – Conclusions and References (5%)</b>	No conclusion and no references done	Conclusion are incomplete and no references done	Conclusion are adequate and provided some citations and references	Conclusion are clear and concise. Provided proper and well-formatted in-text citations and the list of references

## Appendix 2: Assessment Criteria for Mid-Term and Final Presentation

Please note that the instructor would ask you individually on your and your team mates' participation in the project. Your score may vary from your team mates should there be sufficient evidence that you did not contribute to the team.

<u>Criteria</u>	<u>Does Not Meet Expectation</u> (<40%)	<u>Below Expectation</u> (40% to 49%)	<u>Meet Expectation</u> (50%-79%)	<u>Exceed Expectation</u> (>80%)
<b>Presentation skills – Teamwork (15%)</b>	Presentation does not sufficiently present the topic.	Presentation describes the topic.	Presentation describes the topic.	Presentation thoroughly and concisely presents the topic.
<b>Slide Content (20%)</b>	Content arrangement is somewhat confusing and does not adequately assist the viewer in understanding order without narration	Content arrangement is somewhat confusing and does not adequately assist the viewer in understanding order without narration	Content is arranged so that the viewer can understand order without narration	Content is clearly arranged so that the viewer can understand order without narration
<b>Visual Presentation (5%)</b>	Not very visually appealing; cluttered; colors and patterns hinder readability	Somewhat cluttered; colors and patterns detract from readability	Overall visually appealing; not cluttered; colors and patterns support readability	Overall visually appealing; not cluttered; colors and patterns enhance readability

## Mapping of Course ILOs to EAB Graduate Attributes

<b>Course Code &amp; Title</b>	CH5221 Food Industry Seminar Series
<b>Course Type</b>	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)											
○ Weakly consistent (contributes to about 25% of Student Learning Outcome)											
Blank Not related to Student Learning Outcome											

Course ILOs		EAB Graduate Attributes
1)	discuss global food issues from the perspectives of food MNCs and food regulatory bodies from around the world.	b, c, d, e, f, h, i, j
2)	identify and recognize important food issues such as: a. Food Security - Smart technology for primary production - Enhance process in house capabilities - Ensure food is safe for consumption b. Food Sustainability - Novel technology for prolonged food shelf life - Nutrition profiling for healthy lifestyle c. Food Waste Management - Food waste conversion to food ingredients - Food waste utilization for wider applications	a, b, c, d, e, f, h, i, j
3)		
4)		
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).

No	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](#)