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

Course Overview

Expected Implementation in Academic Year (New format)	AY2025-2026
Semester/Trimester/Others (specify approx. Start/End date)	Semester 2
Course Author * Faculty proposing/revising the course	Teo Chee Chong
Course Author Email	teocc@ntu.edu.sg
Course Title	Distribution & Warehousing
Course Code	MT4102
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

The fundamental objective of the course is to provide you with managerial fundamentals of physical distribution and warehousing operation. You will learn concepts and approaches that can contribute towards successful physical distribution and warehousing operations. This course will therefore focus on three areas of student learning:

a. Operational aspects of distribution: management of inventory and freight transport
b. Tactical/Strategic aspects of distribution: Distribution Network Design and Facility Location
c. Warehousing operations: Planning and designing of basic warehousing processes and layouts

Course's Intended Learning Outcomes (ILOs)

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

ILO 1	Analyse the core logistics drivers (Facility, Inventory and Transport) and their cost trade-offs with relation to customer service in physical distribution.
ILO 2	Identify and explain how non-logistical factors can influence the success of physical distribution.
ILO 3	Propose suitable distribution networks for different products and/or businesses environments.
ILO 4	Discuss the purposes, benefits and limitations pertaining to various technologies and methodologies of different warehousing processes.
ILO 5	Propose suitable warehousing solutions for different operational scenarios with the aim of enhancing warehousing productivity.

Course Content

1. Introduction to the distribution and warehousing environment
2. Distribution management (1): Inventory management
3. Distribution management (2): Transport management
4. Distribution management (3): Facility location
5. Distribution network design
6. Classification of warehouses
7. Sizing of warehousing facilities
8. Inbound warehousing operations (Receiving, putaway and internal transportation)
9. Storage and Cross-docking. Order-picking. Shipping.
10. Warehouse efficiency and productivity; Warehouse Management Systems (WMS).

Reading and References (if applicable)

Readings are revised year to year to keep up with the latest development in the subject. Other more classic readings are mostly from the following books:

1. Chopra, S. & Meindl, P. (2015). Supply Chain Management – Strategy, Planning & Operations, Pearson Prentice Hall.
2. Frazelle, E.H. (2001). World-class warehousing and material handling, McGraw Hill.
3. Mulcahy, D.E. (1994). Warehouse distribution and operations handbook, McGraw Hill
4. Napolitano, M. (1998). Using modeling to solve warehousing problem: a collection of decision-making tools for warehouse planning, Warehousing Education and Research Council.

Teaching faculty will provide updated reading materials when it is available.

Planned Schedule

Week or Session	Topics or Themes	ILO	Delivery Mode	Activities	Readings
1	Introduction to course. Introduction to physical distribution and warehousing environment	1	In-person	Lectures	Lecture Slides
2	Distribution management (1): Inventory management – inventory policies (periodic and continuous)	1	In-person	Tutorial and lectures	Lecture Slides
3	Distribution management (1): Inventory management – centralization/decentralization of inventories; aggregation of stocks; postponement strategy.	1,2	In-person	Tutorial and lectures	Lecture Slides
4	Introduction to distribution network design	1,2,3	In-person	Tutorial and lectures	Lecture Slides
5	Distribution management (2): Transport management – transport network configurations	1,2,3	In-person	Tutorial and lectures	Lecture Slides
6	Distribution management (3): Facility location	1,2	In-person	Tutorial and lectures	Lecture Slides

Week or Session	Topics or Themes	ILO	Delivery Mode	Activities	Readings
7	Classification of warehouses; Sizing of warehousing facilities	5	In-person	Tutorial and lectures	Lecture Slides
8	Quiz 1	1, 2, 3, 5	In-person	Quiz	Lecture Slides
9	Inbound warehousing operations	4	In-person	Tutorial and lectures	Lecture Slides
10	Storage and Cross-docking	4	In-person	Tutorial and lectures	Lecture Slides
11	Order-picking. Shipping.	4	In-person	Tutorial and lectures	Lecture Slides
12	Warehouse Analysis. Principles of World-Class Warehousing.	4,5	In-person	Tutorial and lectures	Lecture Slides
13	Warehouse Management Systems (WMS). Quiz 2.	4,5	In-person	Tutorial and lectures	Lecture Slides

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	This provides you with the needed background for outcomes (1) to (5) and to allow you to apply principles and methodologies related to Distribution and Warehousing management, as well as the multi-disciplinary relationship with other factors (e.g., cross-functional factors and disruptive technologies).
Tutorials	Comprises mostly qualitative questions, some of which are open-ended case questions. Some quantitative questions are also included to provide practices for practical data-based analysis. The tutorials offer you with opportunities to analyse practical problems that address outcomes (1) to (5).

Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Description of Assessment Component	Team/Individual	Rubrics	Level of Understanding
1	Summative Assessment (EXAM): Final exam(Final Exam)	1 to 6	SLO* A, C, F, G, H	60	Exam will be conducted physically in a exam hall at the end of the semester	Individual	Holistic	Relational
2	Continuous Assessment (CA): Test/Quiz(CA1: Quiz 1)	1 to 3	SLO* A, C, F, G, H	25	Quiz will be conducted physically during one of the lecture session	Individual	Analytic	Relational
3	Continuous Assessment (CA): Test/Quiz(CA 2 : Quiz 2)	4, 5	SLO* A, C, F, G, H	15	Quiz session will be conducted physically during one of the lecture session	Individual	Analytic	Multistructural

Description of Assessment Components (if applicable)

Formative Feedback

Instructors take questions during and at end of lectures, and provide on-the-spot clarifications. You (students) can also confer with instructors at tutorials/discussions, at appointed consultations or via email.

You (students) are assessed based on the two quizzes during the semester. Feedback on each quiz assessment will be provided upon the completion of grading.

NTU Graduate Attributes/Competency Mapping

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

Attributes/Competency	Level
Creative Thinking	Intermediate
Problem Solving	Intermediate
Transdisciplinarity	Intermediate
Critical Thinking	Intermediate
Systems Thinking	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)

You are expected to take responsibility to follow up with course notes, assignments and course related announcements. You are also expected to participate in class discussions and submit the project report before the stipulated deadline.

Policy (Absenteeism)

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. There will be no make-up opportunities for in-class activities.

Policy (Others, if applicable)

This course will adopt NTU's policy on the use of AI for take-home assignments and reports, and project reports and presentation slides. More details could be found via the link https://entuedu.sharepoint.com/sites/Student/dept/ctlp/SitePages/Exploring-the-Impact-of-Generative-Artificial-Intelligence-(GAI)-Tools-on-Education.aspx#1-proper-citations-and-acknowledgements

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