

MT4103 Port Planning and Operations

Academic Year	2023-24	Semester	2
Course Coordinator			
Course Type	Major Prescribed Elective		
Pre-requisites	Nil		
AU	3		
Grading	Letter Grading		
Contact Hours	39 (Lecture: 26 Hours; Tutorial: 13 Hours)		
Proposal Date	14 September 2023		

Course Aims

The main objective of the course is to equip students with the fundamentals of the planning and operational processes and issues of ports and terminals.

At the end of the course, you should be able to learn all the concepts and various considerations and approaches that can contribute towards successful planning and operations of various ports and terminals.

Intended Learning Outcomes (ILO)

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

1. Identify different types of ports and terminals and their operating handling equipment
2. Discuss suitable considerations and strategies in overall planning and design of ports and terminals
3. Analyse and propose the details of the layout design
4. Analyse and propose the optimal handling capacity with respect to the overall planning
5. Identify various operations functions in ports and terminals operations
6. Discuss what are the best cargo handling equipment and technologies for the smooth operations

Course Content

No	Topic	Lecture	Tutorial
1.	Introduction to the characterization of port system	4	1
2.	Methods, techniques and processes for port planning and design	4	1

3.	Various considerations for overall port planning and operations	2	2
4.	Port and terminal design and issues	4	3
5.	Port and terminal operations	4	3
6.	Port and terminal management – traffic management, VTS, port navigational system, pilotage and tugs	2	1
7.	Port and terminal infrastructures, facilities, cargo handling equipment and technologies	4	2
8.	Cases review of various real-life port planning and operations	2	0
	Total	26	13

Assessment (Includes both continuous and summative assessment)

Component	ILO Tested	EAB Graduate Attributes	Weightage	Team / Individual	Rubrics
1. CA1: Quiz	1-3, 5, 6	A-J, L	15%	Individual	N.A.
2. CA2: Individual Project with Report	1-3, 5, 6	A-J, L	25%	Individual	Appendix 1
3. Final Examination	1-6	A-H, L	60%	Individual	N.A.
Total			100%		

Programme Learning Outcomes

✓ **Competency**

- A. Develop an overall awareness of maritime activities, port and shipping industry and their association with economy and trade.
- B. Describe and apply concepts and theories in sub-fields as contributing to the maritime industry and integrate various related themes, skills and knowledge
- C. Understand and manage the maritime environment
- D. Apply related information pertaining to procedures, operations and management of maritime entities and operational issues in the maritime industry
- E. Capture and analyse market data using analytical tools, conduct related research in the maritime arena, as well as design, develop and execute maritime projects
- F. Engage in lifelong learning in preparation for current and future vocations and career options in the maritime environment.

✓ **Creativity**

- G. Approach and solve basic maritime problems, through both strategic and research methods, and put theoretical knowledge into practical applications in related industries
- H. Develop maritime related risk management strategies.

✓ **Communications**

- I. Communicate shipping and maritime management in policy, strategy, and prevailing issues and requirements in an organization and to achieve good teamwork.
- J. Write professional reports and conduct public speaking confidently

✓ **Character**

- K. Recognise the importance of a strong and just leadership, comply to ethical standards, and uphold highest standards of integrity as a professional

✓ **Civic Mindedness**

- L. Integrate all related skills and knowledge into the industry and exercise due diligence as a highly responsible professional, contributing towards nation and the society.

Formative Feedback

The lectures shall be interactive where your (students) inputs are highly encouraged in the process.

Instructors will 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 on an individual report writing and a final exam. The individual report writing requires submission of a written report. Feedbacks for the report will be provided upon the completion of marking and grading where grades will also be informed.

Learning & Teaching Approach

Approach	How does this approach support students in achieving the learning outcomes?
Lectures	This provides you with the needed background for outcomes (1) to (6) and to allow you to apply principles, methodologies and considerations related to strategy planning, implementation, and operational management in the port industry.
Tutorials	Comprises mostly qualitative questions, where most 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 (6).

Readings & References

List of references used in the course:

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. Thoresen, Carl A. (2003) Port designer's handbook: recommendations and guidelines, London: Thomas Telford
2. Takel, R. E. (1983) Planning land use in port areas: getting the most out of port infrastructure, United Nations
3. Bennett, Larry. Admiralty list of radio signals. Vol. 6, part 1, Pilot services, vessel traffic services and port operations: United Kingdom and Ireland (including European channel ports) [2005/06 ed.]

Course Policy & Student Responsibility

(1) General

Students 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.

(2) 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.

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 recognise 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. 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. If you are uncertain about the definitions of any of these terms, you should refer to the [Academic Integrity Handbook](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Course Instructors

Instructor	Office	Phone	Email

Planned Weekly Schedule

Week	Topic	Course LO	Readings/ Activities
1	Introduction to port cluster development	1	Tutorial and lectures
2	Characterization of port system and planning	1	Tutorial and lectures
3	Methods and processes for port planning and design – vessel traffic	2	Tutorial and lectures
4.	Methods and processes for port planning and design – simulation	2	Tutorial and lectures
5	Industrial applications of technology in port operations	1, 6	Tutorial and lectures
6	Port planning considerations – geographical, economical, meteorological, technical and others	2	Tutorial and lectures
7	Port layout design and issues	3	Tutorial and lectures
8	Port capacity design and issues	4	Tutorial and lectures
9	Cargo handling & operations in container terminals – operations	5	Tutorial and lectures
10	Cargo handling & operations in container terminals – port security and others	5	Tutorial and lectures
11	Cargo handling & operations in bulk terminals	5	Tutorial and lectures
12	Cargo handling facilities and equipment	1, 6	Tutorial and lectures
13	Case reviews and studies	1-6	Tutorial and lectures

Appendix 1: Individual Project with Written Report (25%)

The topics for the Individual Report covers ILO 1-3 and 6. You (student) will write an individual report on your findings. This assessment is covered by the following marking scheme. More details of the report length and specific requirements will be briefed by the course instructor.

Criteria	Good (8-10)	Ave (6-7)	Fair (4-5)	Poor (1-3)	Remarks
Report generated by Turnitin	Within acceptable degree of originality? (Yes/No)				Fresh report, in case of too many commonalities.
Background/ Objective/ Purpose					Accurate contextualisation of background and description. Well defined issues; clear objectives.
Methodology/ Information / Data Collection					Ability and independence in acquiring <u>relevant and useful</u> information/data for the study.
Findings and Discussion					Well-presented results with discussion, showing ability to understand problem, interpret information obtained, and be cognisant of limitations. Innovative (and well justified) solutions will be favourably evaluated.
Conclusions and Recommendations					Summarise report clearly and show ability to make appropriate and relevant conclusions, with clear and workable recommendations.
References and Report Format					Report is clear and concise; good grammar and spelling with appropriate tables/ graphs/ figures. Report is presented well with logical sequence.