

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

Course Overview

Expected Implementation in Academic Year (New format)	
Semester/Trimester/Others (specify approx. Start/End date)	
Course Author * Faculty proposing/revising the course	Lee-Chua Lee Hong
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Course Title	Mathematics II for Maritime Studies
Course Code	MT2004
Academic Units	3
Contact Hours	39
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	MT1001 Mathematics I for Maritime Studies
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

This course together with Mathematics for Maritime Studies I aim to introduce the basic mathematical theories and techniques as listed in the contents, which will provide the students essential mathematics used in finance, business, management, as well as maritime technology and maritime sciences.

Course's Intended Learning Outcomes (ILOs)

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

ILO 1	Conduct basic matrix operation and matrix inversion.
ILO 2	Solve linear equations by applying Cramer's Rule and Gauss-Jordan elimination.
ILO 3	Solve ordinary differential equations.
ILO 4	Apply linear equations and ordinary differential equations in finance and business.
ILO 5	Describe and explain optimization theory.
ILO 6	Solve linear programming problem and its applications in business.
ILO 7	Perform network analysis and find solutions of some specific network flow problems.
ILO 8	Describe the formulation of queuing models and find solutions of simple queuing models.

Course Content

S/N	Topic
1	Basic matrix operation. Matrix inversion. Linear equations. Cramer's Rule. Gauss-Jordan elimination.
2	Ordinary differential equations.
3	Applications of linear equations and ordinary differential equations in business, finance and economics.
4	Optimization theory. Linear programming. Applications in business.
5	Network analysis and network flow problems. Introduction to Queuing models.

Reading and References (if applicable)

1. Hoffmann, L. D., Bradley, G. L. and Rosen, K. H., Applied Calculus for Business, Economics, and the Social and Life Sciences, 11th edition, McGraw-Hill, 2012.
2. Kreyszig, E., Advanced Engineering Mathematics, 10th Edition, John Wiley, 2011.

Planned Schedule

Week or Session	Topics or Themes	ILO	Delivery Mode	Activities	Readings
1	Basic matrix operation. Matrix inversion.	1	In-person	Lectures & Tutorial	
2	Linear equations. Cramer's Rule	2	In-person	Lectures & Tutorial	
3	Gauss-Jordan elimination.	2	In-person	Lectures & Tutorial	
4	Ordinary differential equations.	3	In-person	Lectures & Tutorial	
5	Ordinary differential equations.	3	In-person	Lectures & Tutorial	
6	Applications of linear equations and ordinary differential equations in business, finance and economics	4	In-person	Lectures & Tutorial	
7	Revision – Matrix Algebra, Linear equations; Optimization Theory.	5	In-person	Lectures & Tutorial	
8	Linear programming.	6	In-person	Lectures & Tutorial	
9	Linear programming. Applications in business.	6	In-person	Lectures & Tutorial	
10	Network analysis and network flow problems.	7	In-person	Lectures & Tutorial	
11	Network analysis and network flow problems	7	In-person	Lectures & Tutorial	

Week or Session	Topics or Themes	ILO	Delivery Mode	Activities	Readings
12	Introduction to Queuing models.	8	In-person	Lectures & Tutorial	
13	Introduction to Queuing models.	8	In-person	Lectures & Tutorial	

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lectures	Weekly lectures to provide you with the specific knowledge and techniques to achieve the learning outcome stated above.
Tutorials	Weekly tutorials to enable you to apply the knowledge to solve structured problems. We encourage you to explore alternative approaches and techniques.

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 Examination)	All	MS SLOs (B), (D)	60		Individual	Holistic	Relational
2	Continuous Assessment (CA): Test/Quiz(Quiz 1)	1,2	MS SLOs (B), (D)	20		Individual	Analytic	Multistructural
3	Continuous Assessment (CA): Test/Quiz(Quiz 2)	5,6,7	MS SLOs (B), (D)	20		Individual	Analytic	Multistructural

Description of Assessment Components (if applicable)

Formative Feedback

1. Feedback will be through the dissemination of the student's performance in quizzes as well as review of the quiz questions in class.
2. We encourage you to initiate an Individual consultation sessions on your particular learning needs.

NTU Graduate Attributes/Competency Mapping

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

Attributes/Competency	Level
Problem Solving	Advanced
Critical Thinking	Intermediate
Systems Thinking	Advanced
Embrace Challenge	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)

The standing university policy governing student responsibilities shall apply.
No special policy for this course.

Policy (Absenteeism)

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](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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