COURSE CONTENT

Academic Year	2023-24	**Semester**	2
Course Coordinator			
Course Code	MT2004		
Course Title	Mathematics II for Maritime Studies		
Pre-requisites	MT1001		
No of AUs	3		
Contact Hours	Total: 39 Hours (Lecture: 26 hours; Tutorial: 13 hours)		
Proposal Date	13 September 2023		

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 Learning Outcomes (Course LO)

By the end of this course, you should be able to:

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

Course Content

S/N	Topic	Lecture Hrs	Tutorial Hrs
1	Basic matrix operation. Matrix inversion. Linear equations. Cramer's Rule. Gauss-Jordan elimination.	5	2.5
2	Ordinary differential equations.	4	2
3	Applications of linear equations and ordinary differential equations in business, finance and economics.	4	2
4	Optimization theory. Linear programming. Applications in business.	7	3.5
5	Network analysis and network flow problems. Introduction to Queuing models.	6	3
	Total:	26	13

Assessment (Includes both continuous and summative assessment)

Components	Course LO tested	Related programme SLO or graduate attributes	weighting	Team/ Individual	Assessment rubrics
1. Final Examination	All	MS SLOs (B), (D)	60%	Individual	
2. Continuous Assessment 1 : Quiz 1	1, 2	MS SLOs (B), (D)	20%	Individual	
3. Continuous Assessment 2 : Quiz 2	5, 6, 7	MS SLOs (B), (D)	20%	Individual	
Total			100%		

*CEE SLOs = Student Learning Outcome For Civil Engineering Progamme (Per BEng Civil Engineering Accreditation)

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.

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.

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.

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

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

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.

Learning and Teaching approach

Approach	How does this approach support students 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.

Textbooks/References:

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.

Course Policies and Student Responsibilities

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

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. 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 of the definitions of any of these terms, you should go to the

Course Instructors

Instructor	Office Location	Phone	Email

Planned Weekly Schedule

Week	Topics	Course LO	Activities
1	Basic matrix operation. Matrix inversion.	1	Lectures & Tutorial
2	Linear equations. Cramer's Rule.	2	Lectures & Tutorial
3	Gauss-Jordan elimination.	2	Lectures & Tutorial
4	Ordinary differential equations.	3	Lectures & Tutorial
5	Ordinary differential equations.	3	Lectures & Tutorial
6	Applications of linear equations and ordinary differential equations in business, finance and economics	4	Lectures & Tutorial
7	Revision – Matrix Algebra, Linear equations		
7	Optimization Theory.	5	Lectures & Tutorial
8	Linear programming.	6	Lectures & Tutorial
9	Linear programming. Applications in business.	6	Lectures & Tutorial
10	Network analysis and network flow problems.	7	Lectures & Tutorial
11	Network analysis and network flow problems	7	Lectures & Tutorial
12	Introduction to Queuing models.	8	Lectures & Tutorial
13	Introduction to Queuing models.	8	Lectures & Tutorial