

COURSE CONTENT

Academic Year	AY2023-24	Semester	2
Course Coordinator			
Course Code	MT1004		
Course Title	Introduction to Meteorology and Oceanography		
Pre-requisites	Nil		
No of AUs	3		
Contact Hours	Lecture: 26 hrs; Tutorial: 13 hr; Lab: 0 hr.		
Proposal Date	13 September 2023		

Course Aims

This course is a foundation earth science course on meteorology and oceanography. Its objective is to provide you with a basic knowledge of the atmospheric and ocean processes.

Intended Learning Outcomes (ILO)

After successfully completing the course, you will be able to:

1. Describe the fundamental knowledge of the physical processes of the ocean and atmosphere, including the history of voyaging;
2. Apply the concepts relating to the properties of seawater to describe changes in the ocean;
3. Apply the knowledge on the atmosphere to describe the ocean currents;
4. Describe the physics governing ocean current movements and the formation of waves and tides;
5. Describe changes to the atmosphere
6. Relate changes of the atmospheric conditions to condensation and cloud formation;
7. Describe atmosphere in motion;
8. Describe wind systems and the formation of thunderstorms and tornadoes.

Course Content

List of key topics taught

S/N	Topic	Lecture Hrs	Tutorial Hrs
1.	Introduction to Oceanography. History of oceanography.	2	1
2.	Properties of seawater.	2	1
3.	Atmosphere and the oceans.	2	1
4.	Ocean current and circulation pattern.	4	2
5.	Waves and tides.	4	2
6.	The earth and its atmosphere.	2	1
7.	Energy, energy balance and temperature distribution.	2	1
8.	Atmospheric moisture and condensation.	2	1
9.	Atmospheric stability and cloud development.	2	1
10.	Atmosphere in Motion.	2	1
11.	Global wind systems. Thunderstorms and Tornadoes.	2	1
Total:		26	13

Assessment (includes both continuous and summative assessment)

Component	Course LO Tested	Related Programme LO or Graduate Attributes	Weighting	Team/ Individual	Assessment rubrics
1. Final Examination	1 - 8	PLO* A, B, E, F	60%	Individual	
2. Quiz 1	1 - 4	PLO* A, B, E, F	20%	Individual	
3. Quiz 2	5 - 7	PLO* A, B, E, F	20%	Individual	
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. Describe and apply concepts and theories in sub-fields as contributing to the maritime industry and integrate various related themes, skills and knowledge
- B. Understand and manage the maritime environment
- C. Apply related information pertaining to procedures, operations and management of maritime entities and operational issues in the maritime industry
- D. Capture and analyse market data using analytical tools, conduct related research in the maritime arena, as well as design, develop and execute maritime projects
- E. Appreciate the maritime environment for vocations and career options

✓ **Creativity**

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

✓ **Communications**

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

✓ **Character**

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

✓ **Civic Mindedness**

- K. 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

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 on two quizzes. Feedback for both the quizzes will be provided upon the completion of grading. You will also be informed of your performance.

Learning and Teaching approach

Approach	How does this approach support students in achieving the learning outcomes?
Lectures	Lectures provide you with the needed background for Outcomes (1) to (8) and to allow you to apply the concepts and knowledge relating to the physical processes of the ocean and atmosphere.
Tutorials	Tutorials comprise mostly qualitative questions to challenge students to acquire more in-depth knowledge of the subjects. Some quantitative questions are included to provide practices for analyses. The tutorial sessions offer you opportunities to discuss practical problems relating to Outcomes (1) to (8).

Reading and References

List of references used in the course:

Readings are revised year to year to keep up with the latest development of the subject. Other more classic material are mostly from the following books and supplementary information obtained in related video recordings:

1. Ahrens, C. D., **Meteorology Today: An Introduction to Weather Climate and The Environment**, 7th edition, Thomson Learning Inc, 2002
2. Garrison, T., **Essentials of Oceanography**, 3rd edition, Thomson Learning Inc, 2004
3. Sverdrup, K.A., Duxbury, A.B. and Duxbury, A.C., **Fundamentals of Oceanography**, 5th edition, McGraw-Hill Companies Inc, 2006
4. The Life and Times of El Nino (DVD Video: K576577)
5. The Raging Planet – El Nino (DVD Video: H576853)

Course Policies and Student Responsibilities

(1) General

You are expected to take responsibility to follow up with the course notes, assignments and course related announcements. You are also expected to participate in class discussions and attend both quizzes.

(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 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 [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 Location	Phone	Email

Planned Weekly Schedule

Week	Topic	Course LO	Readings/Activities
1	Introduction to Oceanography. History of oceanography	1	Lectures
2	Properties of seawater	2	Tutorial and lectures
3	Atmosphere and the oceans	3	Tutorial and lectures
4	Ocean current and circulation pattern	3, 4	Tutorial and lectures
5	Ocean current and circulation pattern	3, 4	Tutorial and lectures
6	Waves and Tides	4	Tutorial and lectures
6	Quiz 1		
7	Waves and tides	4	Tutorial and lectures
8	The earth and its atmosphere.	5	Tutorial and lectures
9	Energy, energy balance and temperature distribution.	5, 6	Tutorial and lectures
10	Atmospheric moisture and condensation.	6	Tutorial and lectures
11	Atmospheric stability and cloud development.	6	Tutorial and lectures
12	Atmosphere in Motion	7	Tutorial and lectures
12	Quiz 2		
13	Global wind systems. Thunderstorms and Tornadoes.	8	Tutorial and lectures