THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Marine Science and Technology

MST 401 Chemical Oceanography

COURSE PARTICULARS

Course Code: MST 401
Course Title: Chemical Oceanography
No. of Units: 2
Course Duration: Two hours of theory and ..... practical per week for 15 weeks
Status: Compulsory
Course Email address: mst401@
Course webpage:
Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

This course is a core course which introduces the students' to Chemical Oceanography.

An introduction to the chemistry of the oceans. Descriptive chemical oceanography of the components of ocean waters (metals, gases, organic compounds and nutrients). Chemical processes occurring in marine and estuarine waters and their impact on the near-shore and oceanic environments. Geochemistry of marine sediments – diversity of chemical nature and processes; Radiometric dating – involving environmental and mineral-based isotopes. Stable isotopes as water mass tracer. Biogeochemical cycles in oceanic systems.

COURSE OBJECTIVES

The objectives of this course include:

- Introduce the students to the fundamentals of chemical oceanography, principles and applications,

- Provide the students with the opportunities to develop skill and undertake responsibilities for chemical oceanographic data parameter design, acquisition, processing and interpretation
- Get the students acquainted with advances in research and evolving technology and state-of-the-art operations in the marine environment

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:
(Knowledge based)

- understand the theory and applications of the Chemical Oceanography method of marine exploration;
- determine the Chemical Oceanography parameters appropriate for any specialized sea-borne exploration scheme;
- determine software algorithms appropriate for processing and interpretation of Chemical Oceanography data;
- Serve in Advisory capacity on the economic viability or otherwise of an oceanography project.

(Skills)

- To undertake/supervise a Chemical Oceanography survey and make use of state-of-the-art equipments appropriate for industrial operations;
- Processing Chemical Oceanography data;
- Interpretation of Chemical Oceanography dataset using standard interpretation packages;
- Undertake advance research studies in chemical oceanographic methodologies.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	0%
Assignments	20%
Test(s)	20%
Final examination	60%
Total	**100%**

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, *etc*.) during lectures. Food and drinks are not permitted in the laboratories.

READING LIST

[5]Keith A. Sverdrup, Alison B. Duxbury and Alyn C. Duxbury (2004) Fundamental of Oceanography, Mcgraw-Hill College; 5 edition. 342pp

[5]Stephen P. Riley and G. Skirrow (1975), Chemical Oceanography, Academic Pr. 564pp

[5]Open University (1989) Ocean Chemistry and Deep-Sea Sediments, Butterworth-Heinemann Ltd; 1 edition,

[5] Allan P. Truijillo & Harold V.Thurman (2013) Essentials of Oceanography, 11th Editions, Prentice Hal. 608pp

[5]Tom S. Garrison (2009) Oceanography: An Invitation to Marine Science Seventh edition, Cengage Learning. 608pp

[5]Bernard W. Pipkin, Donn S. Gorsline, Richard E. Casey and Dean A. Dunn (2001) Laboratory Exercises in Oceanography Third edition, Freeman, W. H. & Company

[5]Joseph M. Moran (2011) Ocean Studies: Introduction to Oceanography, Third edition

[5]Open University (2000), Waves, Tides and Shallow Water Processes 2nd Edition, Butterworth-Heinemann Ltd. 228pp

[5]Mark Denny (2008), How the Ocean Works: An Introduction to Oceanography, Princeton University Press. 344pp

[5]Frank J. Millero (2005) Chemical Oceanography, Third edition, CRC Press. 536pp

[5]Harold V. Thurman (1995) Laboratory Exercises in Oceanography 4th Edition, Prentice Hall. 150pp

Legend
1- Available in the University Library
2- Available in Departmental/School Libraries
3- Available on the Internet.
4- Available as Personal Collection
5- Available in local bookshops.

COURSE OUTLINE

Week	Topic	Remarks
1	An introduction to the chemistry of the oceans.	During this first class, the expectation of the students from the course will be documented.
2 & 3	Descriptive chemical oceanography of the components of ocean waters (metals, gases, organic compounds and nutrients).	
4 & 5	Chemical processes occurring in marine and estuarine waters	
6	Impact of Chemical processes occurring in marine and estuarine water on the near-shore and oceanic environments.	
7 & 8	Geochemistry of marine sediments – diversity of chemical nature and processes;	MID-SEMESTER TEST
9 & 10	Radiometric dating – involving environmental and mineral-based isotopes.	
11 & 12	Stable isotopes as water mass tracer.	

13 & 14	Biogeochemical cycles in oceanic systems.	
15	Revision	The students will be allowed to read over the course materials given them during the week and tutorials will be organized for them to evaluate whether their expectations on the course have been met.