Course Specifications

General Information

Course name	Marine Geology
Course number	GEOL4233
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	2
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Recognition and understanding of the major marine bottom morphology
2 - The important part of the marine environment, its composition, structure and interaction with marine water
3 - Understanding of marine sediments types and sedimentation
4 - Understanding the seawater composition and circulation

Intended Learning Outcomes

Knowledge and Understanding	* Provide a general background on marine geology in general to enable an understanding of marine processes * Develop an understanding of the history of ocean exploration and sampling
Intellectual Skills	* Students will understand and be able to apply the scientific inquiry process to interpret of marine sediments lithology
Professional Skills	* Develop an understanding of the properties of water;water motions, waves, tides and shoreline processes; deltas, lagoons and estuaries
General Skill	* The primary objective of this course is to learn about the origin, structure and evolution of the ocean basins and their margins. Our approach will be interdisciplinary, requiring integration of chemical, physical and biological processes, as well as geologic processes

Course Contents

1 - Introduction to marine geology and exploration
2 - Plate tectonics , rate of spreading and mechanism
3 - Morphology of open ocean
4 - Continental margins
5 - Oceanic crust
6 - Marine sediments
7 - Seawater and its composition
8 - Marine Circulation and Tides

Teaching and Learning Methods

1 - Two hours lecture meeting a week. Lectures will be interactive and will involve use of power point presentations, blackboard, and group discussions. Material will be posted on the web

Teaching and Learning Methods for the Disabled Students

1 - Two hours lecture meeting a week. Lectures will be interactive and will involve use of power point presentations, blackboard, and group discussions. Material will be posted on the web

Students Assessment

Assessment Method	TIME	MARKS
First midterm exam	6th week	25
Second Midterm exam	12th week	25
Final exam	16th week	50

Books and References

Course note	Lecture Notes
Essential books	Introduction to Marine Geology and Geomorphology" by Cuchlaine A. M. King
Recommended books	Seawater: Its Composition, Properties and Behaviour, prepared by an open university course team
	Essentials of Oceanography, by Harold V. Thurman.
	Beach processes and sedimentation, by Paul D. Komar.
	Marine Geology: Exploring the new frontiers of the ocean, by Jon Erickson. 3

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Introduction to marine geology and exploration Plate tectonics, rate of spreading and mechanism	1st week	Explain the general information about Exploration methods and history	Understanding the early geologists thought about the ocean floor and morphology Exploration Methods	Exploration of the ocean floor creates a new understanding of the forces that shaped the planet	Introduction to marine geology and exploration Plate tectonics, rate of spreading and mechanism
Plate tectonics, rate of spreading and mechanism	2nd, 3rd week	Understanding the theory of plate tectonic and seafloor spreading	Provides the learner with the general evidences of the Continental the Drift theory Dietz (1961), the new global tectonic	Understanding the mechanism of seafloor spreading and the rate of ocean floor spreading	Plate tectonics, rate of spreading and mechanism Proof for Seafloor Spreading Plate Boundaries
Continental margins	4th and 5th week	Understanding the zone of the ocean floor that separates the thin oceanic crust from thick continental crust	Provide the learner with chracteristics of the continental shelf, continental slope, and continental rise	Understand the specific characteristics of continental shelf	Understanding the zone of the ocean floor that separates the thin oceanic crust from thick continental crust
Morphology of Open Ocean	6th and 7th week	Understanding the major morphology of open and deep ocean	Explain the construction and the characteristics of Submarine Ridge, Island arcs and deep ocean trenches, seamounts and guyots, and Abyssal plains and hills, Atolls and coral reef	Explain the construction and the characteristics of Submarine Ridge, Island arcs and deep ocean trenches, seamounts and guyots, and Abyssal plains and hills	Understanding the major morphology of open and deep ocean, The Ring of Fire

Marine sediments	8th, 9th, and 10th week	Understanding the main marine sediments and characteristics Classifying marine sediments according to origin and location	• Define lithogenous, biogenous, hydrogenous, and cosmogenous sediments and discuss the origin and mineral composition of lithogenous sediments	Differentiate between neritic and pelagic sediment deposits	Understanding the main marine sediments and characteristics Classifying marine sediments according to origin and location
Oceanic Crust	11th week	Understanding the structure of oceanic crust	Description of oceanic crust layers	Understanding the structure of oceanic crust	Understanding the structure of oceanic crust
Seawater Composition and Circulation	12th - 15th week	Explain the main constituents of water column, elements concentration and circulation of currents	Understanding the nature of Seawater Chemicals Understanding the nature of upwelling and downwelling currents	Learner will get a knowledge about Ekman Spiral theory and eddies Tides current and characteristics General types of Tides	Explain the main constituents of water column, elements concentration and circulation of currents
Revision	16th week	Revision	Revision	Revision	Revision