



# AMITY UNIVERSITY

UTTAR PRADESH

## FORMAT FOR COURSE CURRICULUM

**Course Title:** Fundamentals of Marine Science

**Credit Units:**

L	T	P/S	SW/FW	No. of PSDA	TOTAL CREDIT UNITS
4	-	-	4	3	6

**Course Level:** UG

**Course Code:** MAR106

**Course Objectives:** The aim of this course is to introduce the students to the basic concepts of marine science. Students will be familiarized with various marine habitats and their inhabitants. Students will be briefed about autotrophs in marine ecosystem. Course will also focus upon animal association in marine environment.

**Pre-requisites:** Nil

### **Course Contents/Syllabus:**

	Weightage (%)
<b>Module I</b> <b>Descriptors/Topics</b> History of Marine Sciences. Structure of earth, World ocean, The Ocean as a Habitat -Ocean continents and basins, Classification of Marine environment, pelagic environment, benthic environment, intertidal, interstitial. Other coastal environments, seagrass beds, kelp forests, polar seas and hydrothermal vents.	15%
<b>Module II</b> <b>Descriptors/Topics</b> Benthic Communities- The intertidal zone - Regions of the intertidal zone, Environmental complexity caused by tides, Sandy beaches, Rocky shores and muddy shores	20%

Estuaries- Types, Circulation and salinity, Sediments and habitats. Wetlands- temperate wetlands-salt marshes, tropical wetlands-mangrove swamps, mudflats. Economic uses of estuaries	
<b>Module III</b>	<b>20%</b>
<b>Descriptors/Topics</b> Properties of water, Properties of seawater- Special adaptations to salt water, Marine fluid environment relationships vs terrestrial environment relationship, Marine Primary Producers. Phytoplankton –Cyanobacteria, Chrysophyta, Dinophyta- General characteristics. Marine Plants - Green algae (Chlorophyta), Brown algae (Phaeophyta), Red algae (Rhodophyta), Flowering plants (Anthophyta)	
<b>Module IV</b>	<b>15%</b>
<b>Descriptors/Topics</b> Coral Reefs-rainforests in the sea, Coral anatomy, reproduction, and growth, Distribution and ecology of corals, Formation and types of coral reefs, Zonation in coral reefs, Symbiotic relationships in reef communities, Catastrophic mortality of coral reefs-natural and anthropogenic	
<b>Module V</b>	<b>10%</b>
<b>Descriptors/Topics</b> Factors that influence living conditions of the bottom-Continental shelves, The abyss, The Pelagic Realm, Inhabitants of the deep sea floor, Deep sea hot springs, Technological advancement in deep sea exploration.	
<b>Module VI</b>	
<b>Descriptors/Topics</b> Animal association in marine environment- endocism, inquilinism- phrosis-epizoism- mutualism- communalism- symbiosis- parasitism. Interspecific competition. Predator-prey relationship. Marine zoogeography with reference to Indian, Arctic and Antarctic Oceans.  Marine ecosystem concepts- principal components- marine food chains- trophic structure food web- ecological pyramids- energy flow- evolution and management system ecology and modeling.	<b>20%</b>

**Course Learning Outcomes:**

After completing the course, student will be able to

- **tell** structure of earth and ocean along with various marine habitats

- **explain** about estuaries, intertidal zones and various types of wetlands
- **apply** knowledge gained to identify various types of aquatic flora
- **discover** coral biology and to examine mass mortality in corals.
- **appraise** deep sea ecosystem
- **discuss** animal association in marine ecosystem

### Pedagogy for Course Delivery:

Course will be delivered in the form of lectures, videos and power point presentations. E-content with 4quadrant approach will be available to the students for self-learning. Students will spend minimum 4 hrs per week for selfwork on certain topics. Coastal area visit and Value addition by the guest lectures are integral part of learning for the course. Course will be delivered in Face to face/ remote learning or in hybrid mode as per the requirement.

### List of Professional Skill Development Activities (PSDA):

- Presentation
- Assignment in the form of Review article (Home Assignment 1)
- Report on field visit (Home Assignment 2)

### Lab/ Practicals details, if applicable:

#### List of Experiments:

Nil

### Assessment/ Examination Scheme:

<b>Theory L/T (%)</b>	<b>Lab/Practical/Studio (%)</b>
100	Nil

### Theory Assessment (L&T):

	Continuous Assessment/Internal Assessment (50%)					End Term Examination (50%)
Components (Drop down)	Class Test	Presentation	Home assignment 1	Home assignment 2	Attendance	
Linkage of PSDA with Internal Assessment Component, if any		Presentation	Assignment in the form of Review article	Report on field visit		
Weightage (%)	10	15	10	10	5	50

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**Lab/ Practical/ Studio Assessment: NIL**

	Continuous Assessment/Internal Assessment (____ %)				End Term Examination (____ %)		
<b>Components (Drop down)</b>							
<b>Weightage (%)</b>							

**Mapping Continuous Evaluation components/PSDA with CLOs**

Bloom's Level >	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Course Learning Outcomes Assessment type/PSDA	CLO 1: Student will be able to <b>tell</b> structure of earth and ocean along with various marine habitats	CLO2 Students will be able to <b>explain</b> about estuaries, intertidal zones and various types of wetlands	CLO3: Student will be able to <b>apply</b> knowledge gained to identify various types of aquatic flora	CLO4: Students will be able to <b>discover</b> coral biology and to examine mass mortality in corals.	CLO5: Students will be able to <b>appraise</b> deep sea ecosystem	CLO6 : Student will be able to <b>discuss</b> animal association in marine ecosystem
Class Test	√	√	√	√	√	
Presentation	√	√	√			
Home Assignment 1	√	√	√			
Home Assignment 2				√	√	√

**Text Reading:**

- E-content on Amity LMS (Available on student Amizone id)
- Invitation to Oceanography (eighth edition) by Paul R. Pinet 2021, Jones & Bartlett Learning publication house **ISBN:** 9781284164695
- Essentials of Oceanography (13<sup>th</sup> edition), 2019. **By:** Alan P Trujillo, Harold V Thurman, Prentice-Hall (Pearson Education), ISBN: 9780134891521
- Marine Biology (6<sup>th</sup> Edition) 2021. By Jeffrey Levinton, Oxford University Press. ISBN: 9780197543504
- Practical Handbook of Marine Science (4<sup>th</sup> edition), 2020 by Michael J. Kennish, CRC Press. ISBN 9781138068858
- An Introduction to the Biology of Marine Life, James Sumich WCB/McGraw Hill 1999. ISBN 9780697345417