

COURSE OUTLINE
SBT 418: MARINE MICROBIOLOGY

WEEK	LECTURE	TOPIC	SUBTOPIC
1	1	Introduction to marine ecosystems	Different marine ecosystem Open oceans, Mangroves, Coral reef, Salt marshes Intertidal zone(rocky, sandy, muddy shores)
2	2	Group presentations	Group 1: Good and services derived from marine ecosystems Group 2: Threat to marine ecosystems
3	3		Group 3: Effects of climate change to marine ecosystems Group 4: Effect of ocean acidification on marine microbes
4	4	Chemical and physical composition of sea water	• Major, minor and trace elements of sea water • Dissolved gases • Inorganic and organic compounds
5	5	Ocean Zonation	• Ocean zonation in terms of light, depth and nutrient availability • Benthic vs pelagic divisions of the ocean • Microbial habitats in the ocean
6	6	Marine microbial populations	• Bacteria/Archae • Fungi • Algae (Microalgae) • Viruses
7	7	Group presentation	Group 5: Role of Diatoms in determination of water quality
8	8	Marine microbiological methods	• Sampling methods for water, sediment and plankton samples • Isolation and Culturing techniques for marine microbes
9	9	Measurement of physical chemical parameters in the field	• Sampling of physical chemical parameters of ocean waters • Oxygen, pH, Salinity, Temperature, Redox potential, water transparency, dissolved oxygen
10	7	Practical 1	• Demonstration on tools and equipment's for marine sampling

11	8	CAT 1	
	9	Microbial associations with marine plants and animals	• Microbial associations with plants - Microbial associations with animals (healthy vertebrates) fish model
	10		• Microbial associations with animals (healthy invertebrates)
12	12	Group presentation	Group 6: Role of <i>Vibrio spp</i> in fish and human disease
	13	Microbial Ecology	• Food chains and food webs in marine ecosystems
13	14		• Assimilatory and dissimilatory food chain • Abiotic factors influencing marine microbes (pH, Hydrostatic pressure)
	15		• Abiotic factors influencing marine microbes (Radiation, Oxidation reduction potential, nutrients)
14	16	Biogeochemical cycles	• Carbon, Nitrogen ,Sulphur, Phosphorus cycles
	15	Benefits and malefits of marine microorganisms	• Biodegradation of pollutants • Settling of marine invertebrates • Formation of manganese nodules • Food fermentation
15	17		• Mobilisation of heavy metals • Biofouling(bio deterioration) • Reservoir of human pathogens • Food spoilage
	18		• Marine microbes as sources of biotechnology products and processes • Human health products (anti-viral, anti-microbial , anti-cancer, molecular probes) • Production of enzymes • Environmental health(biodegradation, biosensors, bio surfactants)
	19	Group discussion	Group 7: Case studies of global oil spills and the environmental impacts on marine ecosystems
	20	CAT 2	