

## **MBPGE2-MARINE MICROBIOLOGY**

**Number of Hours / Week: 4**

**Credits: 4**

### **UNIT I**

**Marine Microbial flora:** Marine environment – sea-benthic & littoral zone, salt pan, mangroves and estuarine microbes, microbial loop – marine microbial community – planktons, bacteria, fungi, protozoa Methods of collection and estimation of marine microbes. Influence of physical, chemical and biological factors on marine microbes.

### **UNIT II**

**Marine Adaptability:** Survival at extreme environments – starvation – adaptive mechanisms in thermophilic, alkalophilic, osmophilic and barophilic, psychrophilic microorganisms – hyperthermophiles and halophiles

### **UNIT III**

**Marine Microbial Disease:** Marine food borne pathogens & Water borne pathogens – *Aeromonas, Vibrio, Salmonella, Pseudomonas, etc..*

### **UNIT IV**

**Marine Pollution:** Microbial indicators of marine pollution and control-, biofouling, biocorrosion, biofilms and bioremediation

### **UNIT V**

**Marine Microbial Biotechnology:** Marine natural products, valuable chemicals, bioactive compounds from marine microorganisms, marine bio-sensor and transgenic marine organisms. Biosurfactants, biopolymers and novel enzymes from marine organisms.

### **References:**

1. Prescott LM, Harley JP, & Klein DA (2005) *Microbiology* (McGraw-Hill, Boston ; London) 6<sup>th</sup> ed
2. Maier RM, Pepper IL, & Gerba CP (2009) *Environmental Microbiology* (Elsevier Academic Press)
3. Nybakken JW & Bertness MD (2005) *Marine biology: an ecological approach* (Pearson/Benjamin Cummings)
4. Belkin S & Colwell RR (2006) *Oceans And Health: Pathogens In The Marine Environment* (Springer Science+Business Media)
5. Gal YL, Ulber R, & Antranikian G (2005) *Advances in Biochemical Engineering/Biotechnology Advances in Biochemical Engineering / Biotechnology Series Vol 96. Marine Biotechnology Vol 1* Series Editor: Scheper, T
6. Bhakuni DS & Rawat DS (2005) *Bioactive Marine Natural Products* (Springer)