

Course code	Course Title	C	H	I	E	T
17P3BMC8	MICROBIOLOGY	5	6	25	75	100

Objectives:

To perceive the structure and reproduction of organisms and to gauge their influence on the standard of living of human beings.

Learning Outcome:

It enables the graduates with high knowledge and research abilities to further develop various techniques related with microbial world

UNIT I (20hr)

Bacteria : Salient features, Ultrastructure and Exomorphology. Structure of cell wall and capsule.

Viruses: – General characteristics, classification of viruses based on nucleic acids –structure and reproduction of Bacterial viruses (T7 and lambda phages) plant viruses (TMV &CaMV). Brief account on phycoviruses and mycoviruses.

UNIT II (20 hr)

Bacterial growth phases –generation time – synchronous growth –diauxy growth.

Respiratory metabolism : ED pathway –reverse TCA—gluconeogenesis.

Fermentation –homo and hetero lactic. Bacterial photosynthesis –photobacteria –pigments—

Oxygenic and anoxygenic –C3 cycle.

UNIT III (10 hr)

Control of microbes Physical and chemical methods –chemotherapeutic agents –antibiotics (chemical nature and Mode of action) –mechanism of resistance to antibiotics.

UNIT IV (15hr)

Aquatic microbiology : Microbial flora –sewage treatment (primary ,secondary and tertiary)

Agricultural microbiology : Bio fertilizers –nitrogen fixation (symbiotic and asymbiotic)

- phosphate solubilization –mycorrhizae (Ecto-, Endo- and VAM). Biopesticides (bacterial , fungal and viral).

UNIT V (15hr)

Food –Microbial flora- contamination and spoilage of vegetables, meat and milk – methods of food preservation. Pasteurization.

Fermentor – design and operations; production of cheese, ethanol, citric acid and penicillin.

Clinical features- symptoms, lab diagnosis, prophylaxis and treatment of Tuberculosis and AIDS.

REFERENCES:

1. Purohit ,S.S.2012. Microbiology and applications. Student edition, Jodhpur, India.
2. Dubey, R.C. and Maheswari, D.K. 2010. A text book of microbiology. S. Chand & company, New Delhi.
3. Pelezar, M.J., Chan,E.C.S and Kreig,N.R.1993. Microbiology – concepts and applications . McGraw Hill, Inc. Newyork.
4. Powar ,C.B. and Daginawala ,H.F.2001.General microbiology, Himalaya publishing house, Mumbai. Vol.II
5. Sharma ,P.D. 2005. Environmental biology. Narosa publishers , New Delhi.
6. Rao, A.S.2001. Introduction to microbiology. Prentice Hall of India, New Delhi.
7. Casida ,L.E. 1997. Industrial microbiology. New publishers, New Delhi.
8. Kumar ,H.D and Swati kumar .1999. Modern concepts of microbiology,Vikas publishing House ,New Delhi.
9. Subha Rao,N.S. 2000. Soil microbiology. Oxford & IBH publishers ,New Delhi.
10. <https://en.m.wikipedia.org>.
11. WWW.highveld.com.

PRACTICALS:

1. Cleaning of glasswares.
2. Sterilization methods .
3. Preparation of media.
4. Culturing of microbes.
5. Ubiquitous nature of microbes.
6. Bacterial staining –a) Simple b) Differential c) Capsule d) Spore.
7. Growth curve of bacteria (turbidity measurement)
8. Identification of microorganisms by biochemical tests a) Catalase test b) Indole test.c) MR-VP test d) Starch hydrolysis e) Gelatin hydrolysis.
9. Antibiosis.
10. Isolation of Rhizobium from root nodules.
11. Milk dye reduction test-Methylene blue and Resazurin.
12. Potable water quality test –MPN method.