

MICROBIOLOGY

Semester	Subject Code	Category	Lecture		Theory		P	C
II	21CAMB2A	Allied - II	5 hrs per week	75	5 hrs per week	75	0	4

COURSE OBJECTIVES:

- To provide education in Microbiology to aspiring learners. The course is to ensure that the students at the end of the programme are able to acquire higher education further leading to prospective career.

COURSE OUTCOME: After completion of the course students will be able to

CO Number	CO Statement	Knowledge level k1 – k4
CO1	Recall the history and classification of microbes.	K2
CO2	Evaluate the structure of microbes and microscopy.	K5
CO3	Apply the different methods of sterilization; types of media and pure culture techniques	K3
CO4	Differentiate the dynamics of microbial interactions with other populations and analyze the human diseases.	K4
CO5	Apply the aspects of microbiology.	K3

Knowledge level: K1- Remember; K2- Understand; K3- Apply; K4- analyze

MAPPING WITH PROGRAM OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	M	M
CO2	S	S	S	M	S	S
CO3	S	S	S	M	M	M
CO4	S	M	S	S	S	S
CO5	M	M	S	S	S	S

S-strong; M- medium; L-low

UNIT I: Overview of history of Microbiology**15 Hours**

Biogenesis and abiogenesis, Contributions of Spallanzani, Pasteur, Tyndal, Joseph Lister, Koch [Germ Theory], Edward Jenner and Flemming [Penicillin]. Scope of Microbiology. Classification of Microbes – Five kingdom concept, three kingdom concept. Bergey's manual of classification (2nd edition).

UNIT II: Ultra structure of microbes and microscopy:**15 Hours**

A detailed account of General structure, growth and reproduction of Bacteria, fungi and Virus. Basic principles in microscopy, Types of microscopes- light, dark, phase contrast, fluorescent and electron microscope- (Transmission and Scanning electron)

UNIT III: Microbiological Media and culture techniques:**15Hours**

Culture and media preparation – solid and liquid. Types of media – semi synthetic, synthetic, enriched, enrichment, selective and differential media., Sterilization and disinfection – principles – methods of sterilization – physical methods – dry heat – moist heat – radiation – filtration (membrane and HEPA) – chemical sterilization – chemical agents – mode of action.

Preservation and maintenance of culture ; Pure culture techniques – tube dilution, pour, spread, streak plate. Anaerobic cultivation of bacteria. Stains and staining techniques – Mechanism of gram staining, acid fast staining, negative staining, capsulestaining, flagella staining, endospore staining.

UNIT IV: Physiology and biochemistry of microbes and human diseases:**15 Hours**

Photo-autotrophs, Chemo-autotrophs, Parasitism, Saprophytism, Mutualism and Symbiosis, Commensalisms, endozoic microbes. Nitrogen metabolism including Nitrogen fixation (Symbiotic and asymbiotic)

Pathogenic Microorganisms:

(A) Bacterial diseases of man – Tetanus, Tuberculosis, Pneumonia and Cholera. (B) Viral diseases: AIDS (HIV).

UNIT V: Microbial applications:

In medicine – antibiotics; penicillin and streptomycin. In agriculture; Bio-fertilizer (bacteria and cyanobacteria). In food and dairy industries; microbial bio-products (SCP, bio-pigments, yeast products and enzymes). Economic and industrial importance of yeast and moulds. Biosensors.

Distribution of Marks: Theory 80% and Problems 20%

TEACHING METHODOLOGY:

- Class room teaching
- Assignments
- Discussions
- Homework
- PPT presentations
- Seminars
- Models and charts

TEXT BOOKS:

S.no	Authors	Title	Publishers	Year of publication
1	R. Anandanarayanan and C.KJ. Paniker.	Text book of Microbiology	Universities press	2010
2	Pelczar.M.,etal.,	Microbiology	Tata-McGraw Hill	2013

REFERENCE BOOKS:

S.no	Authors	Title	Publishers	Year of publication
1	Prescott	Microbiology	McGraw Hill Education	2012
2	Edward A. Birge	Modern Microbiology	Wm. C. Brown Publishers, Inc. U.S.A.	1992

WEB SOURCES:

1. http://www.microrao.com/micronotes/pg/culture_media.pdf
2. <http://library.open.oregonstate.edu/microbiology/chapter/introduction-to-microbiology/>
3. http://microbiology.ukzn.ac.za/Libraries/MICR304/CULTURE_PROCEDURES.sflb.ashx
4. <https://www.docsity.com/en/host-parasite-interactions-microbiology-lecture-slides/232518/>
5. <https://www.studocu.com/en/document/university-of-southern-queensland/medical-microbiology-and-immunology-1/lecture-notes/lectures-notes-1-to-23/319412/view>
6. <http://www.teilar.gr/dbData/ProfAnn/profann-f2bc2d4d.pdf>

Syllabus Designer:

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