Syllabus template

Semester:	**5**	
Course :	Major	
Paper Title:	**BASIC MICROBIOLOGY**	
Paper code:	B3MB230511T	**Credits:** 4
Hours/week :	4	
Category: Core/MDC/SEC/VAC :	**Minor**	
Theory / Practical / Composite:	Theory	
No of Modules :	No	

Course Overview: This course syllabus in minor aims to provide basic knowledge on microbiology, beginning with the structure and function of microorganisms, microbial growth and culturing. This course enables the students to acquire the basic concepts in beginners' microbiology.

Course Outcome:

1. Remember: Learning and remembering the basic concepts of prokaryotic cellular structure and function and appreciate the ubiquitous presence of microbes.
2. Understand: Understanding the basic techniques of culturing and growing bacteria and visualization in the laboratory.
3. Analyze: To analyse the importance of growth of microbes.
4. Apply: Applying the knowledge to control the growth of microbes.
5. Evaluate: Evaluation of methods for culturing microbes.
6. Create: To create scope for incorporation of the knowledge into applied aspects of microbiology.

Prerequisites: ***Basic knowledge about any prior course***

SYLLABUS

UNIT/Module	CONTENT	HOURS or NUMBER OF CLASSES	CO Mapping	COGNITIVE LEVEL
I.	**Introduction to Microbiology and Scope of Microbiology**	2	CO1, CO6	K1,K6
II.	**Bacterial Morphology:** Morphology: Cell size, shape and arrangement. Cell wall, cell membrane, Cytoplasm (nucleoid, plasmid, ribosomes, mesosomes, inclusion bodies. Structures external to cell wall: Glycocalyx, capsules, flagella, pili and fimbriae. Special structure: Endospores.	10	CO1	K1
III.	**Culturing and visualization of microorganisms:**	12	CO2, CO5	K2,K5

	Culture medium: Solid and liquid culture medium. Concept of microbial growth in solid and liquid culture medium. Brief knowledge of pure culture, Methods of pure culture isolation and pure culture development. Stains: Definition, chemistry and classification of stains. Staining techniques: Principles and mechanisms of Simple (Positive and Negative) Staining, Differential (Gram and Acid Fast) Staining, Special (Endospore, Capsule, Flagella).			
IV.	**Microbial growth:** Growth: Definition, Measurement of growth, batch culture (phases of growth, generation time and growth rate), continuous culture, Synchronous growth, diauxic growth.	10	CO2, CO3	K2,K3
V.	**Control of microbial growth:** Physical methods of microbial control: Heat, low temperature, high pressure, filtration,desiccation, osmotic pressure, radiation. Chemical methods of microbial control: types and mode of action of disinfectants	**12**	CO1.CO2, CO4,CO6	K1,K2,K4,K6

Text Books

1. Tortora GJ, Funke BR and Case CL. (2008). Microbiology: An Introduction. 9th edition. Pearson Education
2. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition
3. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited
4. Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International.
5. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.
6. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company.

Suggested readings

1. Powerpoint slides provided in class

Web Resources

1. SWAYAM course on Introductory Microbiology

Evaluation Theory CIA: 30 Semester Exam:70

Paper Structure for Theory Semester Exam:
Short questions: 10 (each 2 marks) from 12 (10x2=20)
Long questions: 5 (each 10 marks) from 7 (5x10=50)

Course outcomes (COs) and Cognitive Level Mapping

COs	CO Description	Cognitive levels
CO1	**Remember:**. Learning and remembering the basic concepts of prokaryotic cellular structure and function and appreciate the ubiquitous presence of microbes.	K1
CO2	**Understand:**. Understanding the basic techniques of culturing and growing bacteria and visualization in the laboratory.	K2
CO3	**Analyze:**. To analyse the importance of growth of microbes	K3
CO4	**Apply:**. Applying the knowledge to control the growth of microbes	K4
CO5	**Evaluate:** Evaluation of methods for culturing microbes.	K5
CO6	**Create:**. To create scope for incorporation of the knowledge into applied aspects of microbiology.	K6