C. U. SHAH UNIVERSITY, WADHWAN CITY.

Faculty of: **Sciences and Life Sciences**
Course: **Bachelor of Science (Microbiology)**
Semester**: I**
Subject Code**: MIM201-1C**
Subject Name: **Introduction to Microbiology**

Sr. No	Category	Subject Code	Subject Name	Teaching hours/ Week			Credit hours	Credit Points	Evaluation Scheme/ Semester								
									Theory				Tutorial / Practical				Total
									Continuous and Comprehensive Evaluation		End Semester Exams		Internal Assessment		End Semester Exams		
				Th	Tu	Pr			Marks	Marks	Marks	Duration	Marks	Duration	Marks	Duration	
1	MAJOR	MIM 201-1C	Introduction to Microbiology	3	-	2	5	4	10 10 05	Assignment Quiz Attendance	50	2	25	1	-	-	100

AIM:

- Aware students of the history of microbiology
- Acquaint the basic concept of microbiology as a subject.
- Basic concepts related to sterilization.
- Learn basic laboratory skills for handling glassware

COURSE CONTENTS

Course Outline for Theory

UNIT	COURSE CONTENT	TEACHING HOURS
I	**History Of Microbiology:** The Discovery Of Microorganisms, Controversy Of Spontaneous Generation, Golden Age Of Microbiology And Developments In The Field Of Medical Microbiology, Immunology, Environmental Microbiology With Special Emphasis On The Contributions Of Robert Hooke, Antoine Von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Edward Jenner, Elie Metchnikoff, Paul Ehrlich, Martinus Beijerinck, Sergei N. Winogradsky, Alexander Fleming, Selman A. Waksman, Ronald Ross, Stanley B. Prusiner And Ananda Mohan Chakraborty.	**12**
II	**Microscopy:** Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluorescence Microscope, Transmission Electron Microscope, Scanning Electron Microscope.	**10**
III	**Sterilization:** Chemical Sterilization (Glass Ware, Surface), Moist Heat (Autoclave), Dry Heat (Hot Air Oven), Filtration	**10**
IV	**Microbes in Human Health & Environment:** Medical Microbiology and Immunology: List Of Important Human Diseases And	**13**

	Their Causative Agents Of Various Human Systems. Definitions Of Immunity (Active/Passive), Primary and Secondary Immune Response, Antigen, Anti-Body And Their Types Environmental Microbiology: Definitions And Examples Of Important Microbial Interactions– Mutualism, Commensalism, Parasitism, Definitions And Microorganisms Used As Bio Pesticides, Bio Fertilizers	

Course Outline for Practical

SR. NO	COURSE CONTENT	HOURS
1	Microbiology Good Laboratory Practices and Biosafety.	30
2	To Study the Principle, Working and Applications of Important Microbiological Instruments Biological Safety Cabinets, Autoclave, Bacteriological and Bod Incubators, Hot Air Oven, Compound Microscope.	
3	Perform Media Preparation and Sterilization Method by Autoclave and Vacuum Sterilization.	
4	Perform Isolation of Air Microflora Using N-Agar Media and PDA Media By Plate Exposer Method.	
5	Perform Simple Staining, Negative Staining, Gram's Staining for Bacterial Staining.	
6	Perform Lacto-Phenol Cotton Blue Staining Method for Fungal Staining.	
7	To Study Microscopy and Perform Observation of Permanent Microscopic Slide	

TEACHING METHODOLOGY:

- Conventional method (classroom blackboard teaching)
- ICT Techniques
- Teaching through the classroom, laboratory work
- Variety of learning styles and tools (PowerPoint presentations, audio-visual resources, e-resources, seminars, workshops, models)
- Teaching through laboratory work

LEARNING OUTCOME:

- Expand the microbiology knowledge using various fundamental aspects of different branches of sciences.
- To gain knowledge about contribution of scientist in microbiology filed
- Obtain significant knowledge about sterilization methods.
- Understanding the importance of laboratory work and laboratory safety
- To gain a knowledge about an application of microorganism in different field.
- Acquire knowledge about types of glassware and their calibration
- To understand the working system of various microscope

Arrangement of lectures duration and practical session as per defined credit numbers:

Units	Lecture Duration (In Hrs.)		Calculation of Credits (In Numbers)		Total Lecture Duration	Credit Calculation
	Theory	Practical	Theory	Practical	Theory+ Practical	Theory+ Practical
Unit – 1	12	30	3	1	45+30	3+1
Unit – 2	10					
Unit – 3	10					
Unit – 4	13					
TOTAL	45	30	3	1	75	4

Evaluation:

Theory Marks	Practical Marks	Total Marks
75	**25**	**100**

REFERENCE BOOKS:

1. Alexopoulus, C.J., Mims, C.W., Blackwell, C.W. (1996). Introductory Mycology. 4th edition. Wiley and Sons, UK.
2. Atlas, R.M. (1997). Principles of Microbiology. 2nd edition. Brown Publishers, USA.
3. Cappuccino, J. and Welsh, C.T. (2016). Microbiology: A Laboratory Manual. 11th edition. Pearson Education, USA. 4. Lee, R.E. (2008). Phycology. 4th edition. Cambridge University Press, UK.
4. Madigan, M.T. and Martinko, J.M. (2017). Brock Biology of Microorganisms. 15th edition. Prentice Hall International Inc., USA.
5. Pelczar, M.J., Chan, E.C.S. and Krieg, N.R. (1993). Microbiology. 5th edition. McGraw Hill, USA.