GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND P.G. COURSES (A)
VISAKHAPATNAM
Department Of Microbiology
Programme Structure for B.Sc. Honours (Microbiology) MINOR
W.e.f AY 2023-24

II Semester COURSE STRUCTURE

Sl. No	Sem	Course	Name of the Course	Hours /Week	Credits	Marks		
						Internal	External	Total
1	II	**Minor (Course-1) (offered for other Courses)**	Introduction to Microbiology	3	3	40	60	100
			LAB: Introduction to Microbiology	2	1	25	25	50
			Total	**5**	**4**			**150**

GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND PG COURSES (A)

DEPARTMENT OF MICROBIOLOGY

Programme: B.Sc. Honours (MICROBIOLOGY): MINOR

SEMESTER – II SYLLABUS w. e. f 2023-24 AY

COURSE 1: - INTRODUCTION TO MICROBIOLOGY

Total No. hours: 45 **Credits – 3**

Course objectives

- To learn the important contributions of scientists to the field of Microbiology and also to Understand the importance of the golden era of Microbiology.
- To become familiar with the system of classification, scope of microbiology, concept of Origin of life and diversity of microbes.
- To study the general characteristics of various Prokaryotic and Eukaryotic microorganisms
- To learn the concept of isolating and culturing microorganisms in laboratory

(CO 1) Unit - 1: History of Microbiology **No. of Hours: 10**

1. Discovery of Microscope and microbial world by Anton von Leeuwenhoek; Aseptic techniques with reference to Charak Samhita, Sushruta Samhita and Ignaz Philipp Semmelweis
2. Golden era of Microbiology- Refutation of abiogenesis; Germ theory of Disease; Discovery of vaccination; Discovery of penicillin
3. Major contributions of Scientists: Edward Jenner, Louis Pasteur, Robert Koch, Joseph Lister, Ivanowsky, Martinus Beijerinck and Sergei Winogradsky

(CO 2) Unit - 2: Place of Microorganisms in the living world **No. of Hours: 10**

1. Haeckel's three Kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese
2. Definition and scope of Microbiology; Applications of Microbiology; Diverse groups of Microorganisms
3. Origin of microbial life on earth- Timeline, Miller's Experiment, endosymbiosis (cyanobacteria), distinguishing features of eukaryotic and prokaryotic cell

(CO 3) Unit - 3: Prokaryotic microorganisms and Viruses **No. of Hours: 10**

1. General characteristics of Bacteria (Morphology, metabolic diversityand reproduction)
2. General characteristics of Archaea differentiating them from Bacteria
3. General characteristics of viruses (Nature, composition, size, host specificity,diversity in structure)

(CO 4) Unit - 4: Eukaryotic microorganisms **No. of Hours: 10**

1. Fungi - Habitat, nutrition, vegetative structure and modes of reproduction
2. Algae- Habitat, thallus organization, photosynthetic pigments, storage forms offood, reproduction.
3. Protozoa–Habitat, cell structure, nutrition, locomotion, excretion, reproduction,encystment.

(CO 5) Unit - 5: Growing Microbes in Lab: Five I's **No. of Hours: 05**

1. Inoculation-Aseptic methods of introducing inoculum to growth media; Composition of basic growth media, solid and liquid
2. Incubation and Isolation- Ambient temperature for growth of microorganisms;Concept of Pure culture, mixed culture and contaminated culture
3. Inspection and Identification - Observation of colour, size and shape of colonies;Wet mount and simple staining of bacteria and fungi

Course Outcomes:

CO 1: Understand the historical significance of microbiology and the contributions ofkey scientists.
CO 2: Recognize the classification of microorganisms and their place in the living world and to comprehend the scope and applications of microbiology.
CO 3: Distinction between eukaryotic and prokaryotic cells and describe the characteristics of bacteria, archaea, viruses.
CO 4: Describe the characteristics of fungi, algae, and protozoa.
CO 5: Develop practical skills in aseptic techniques, growth media preparation, isolationmethods, and the identification of bacteria and fungi.

Reference books for theory:

1. Pelczar, M.J., Chan, E.C.S. and Kreig, N.R. (1993). Microbiology. 5thEdition, Tata McGraw Hill Publishing Co., Ltd., New Delhi.
2. Prescott, M.J., Harley, J.P. and Klein, D.A. (2012). Microbiology. 5th Edition, WCB McGraw Hill, New York.
3. Singh, R.P. (2007). General Microbiology. Kalyani Publishers, New Delhi.
4. Stanier, R.Y., Adelberg, E.A. and Ingram, J.L. (1991). General Microbiology,5th Ed., Prentice Hall of India Pvt. Ltd., New Delhi.

SEMESTER – II PRACTICAL SYLLABUS
COURSE 1: - INTRODUCTION TO MICROBIOLOGY

Credits: 1 **Total No. hours: 30**

1. Good Laboratory Practices and Biosafety
2. Compound Light microscope -Parts and its handling
3. Microscopic observation of bacteria, Algae and Fungi and protozoa
4. Observation of electron micrographs of viruses (Lambda, T4, TMV, HIV, SARS CoV-2, Polio)
5. Laboratory equipment -Working principles of Autoclave, Hot air oven, Laminar airflow chamber

Reference books for Lab:

1. Dube, R.C. and Maheswari, D.K. (2000) General Microbiology. S Chand, New Delhi. Edition), Himalaya Publishing House, Mumbai.
2. Reddy, S.M. and Reddy, S.R. (1998). Microbiology Practical Manual, 3rd Edition, Sri Padmavathi Publications, Hyderabad.
3. Jaya Babu (2006). Practical Manual on Microbial Metabolisms and General Microbiology. Kalyani Publishers, New Delhi.
4. Gopal Reddy et al., Laboratory Experiments in Microbiology

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Programme: B.Sc. Honours (MICROBIOLOGY): MINOR

SEMESTER – II SYLLABUS w. e. f 2023-24 AY

COURSE 1: - INTRODUCTION TO MICROBIOLOGY

MID I MODEL PAPER

Date: **Max. Marks: 20M**

Time:

		PART-A **Answer ALL the following questions**	**3 x 2=6M**	
1	a)	Write about Ignaz Philipp Semmelweis.	2 M	CO 1
	b)	What is Penicillin?	2 M	CO 1
	c)	What are Cyanobacteria.	2 M	CO 2
		PART-B Answer the following questions	2 x 7=14M	
2	a)	Explain the contributions of Antony Von Leeuwenhoek	7M	CO 1
		OR		
	b)	Describe the contributions of Robert Koch.	7 M	CO 1
3	a)	Explain about Whittaker's five Kingdom concept.	7 M	CO 2
		OR		
	b)	Explain about Miller's experiment regarding Origin of life on Earth.	7M	CO 2

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Programme: B.Sc. Honours (MICROBIOLOGY): MINOR
SEMESTER – II MODEL PAPER w. e. f 2023-24 AY
COURSE 1: - INTRODUCTION TO MICROBIOLOGY

Time: 2 &1/2 hours **Total Marks: 60**

		PART – A **Answer ALL of the following questions**	**(5x2=10 Marks)**	
1		What is Germ theory of Disease?	CO 1	2 M
2		Write about Haeckel's three kingdom concept.	CO 2	2 M
3		Differentiate between Archaea and Bacteria.	CO 3	2 M
4		Write about photosynthetic pigments in Algae.	CO 4	2 M
5		Explain method of wet mount technique.	CO 5	2 M
		PART – B **Answer the following questions**	(5x10=50 Marks)	
6	a.	Describe the contributions of Louis Pasteur.	CO 1	10 M
		OR		
	b	Write an essay on discovery of Vaccination.	CO 1	10M
7	a	Describe the scope and Applications of Microbiology.	CO 2	10M
		OR		
	b.	Explain the distinguishing features of Eukaryotic and Prokaryotic cells.	CO 2	10M
8	a.	Explain the general characteristics of Bacteria.	CO 3	10M
		OR		
	b.	Write an essay on the general characteristics of Viruses.	CO 3	10M
9	a.	Describe the habitat, nutrition, structure and reproduction in Fungi.	CO 4	10M
		OR		
	b.	Write in brief the general characteristics of Protozoa.	CO 4	10M
10	a.	Explain the concept of isolating Microorganisms by Pure culture techniques.	CO 5	10M
		OR		
	b.	Explain the principle and procedure of Simple staining.	CO 5	10M

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SEMESTER - II
BLUE PRINT FOR SEMESTER END EXAMINATION (w. e. f 2023-24 AY)

Time : 2 ½ hours **Total Max. Marks: 60**

SECTION – A (5 X 2 = 10 M)

Answer ALL the following questions

Q. No. 1 to Q. NO. 5 - FIVE short Answer Questions covering minimum one question from each unit of the syllabus.

SECTION – B (5 X 10 = 50 M)

Answer the Following Questions

Q.NO. 6 a and b – Two essay questions from Unit – I of the syllabus with an Internal choice.

Q.NO. 7 a and b – Two essay questions from Unit – II of the syllabus with an Internal choice.

Q.NO. 8 a and b – Two essay questions from Unit – III of the syllabus with an Internal choice.

Q.NO. 9 a and b – Two essay questions from Unit – IV of the syllabus with an Internal choice.

Q.NO. 10 a and b – Two essay questions from Unit – V of the syllabus with an Internal choice.