Board of Studies Meeting Dept. of Microbiology

SEMESTER PATTERN

w.e.f.

THE ACADEMIC YEAR 2018-2019

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS)
Vijayawada 520004

SRR & CVR GOVERNMENT DEGREE COLLEGE (AUTONOMOUS)

Vijayawada 520004

Minutes of the meeting of the Board of Studies in the subject of

MICROBIOLOGY

The meeting of the Board of Studies in the subject of Microbiology was held on 20 March 2018 in Dept. of Microbiology Laboratory, SRR & CVR Govt . Degree College (Autonomous), Vijayawada 520004.

The following members attended the meeting:

LIST OF BOS MEMBERS

S.NO	NAME	QUALIFICATION	DESIGNATION	ADDRESS
1.	Mrs.D.Jyothi	M.Sc,B.Ed	Chairman	I/c. Dept. of Microbiology SRR&CVR GDC (Autonomous),
2.	Dr. P.V.Brahmachari	M.Sc, Ph.D	University Nominee	HOD, Dept. of Biotechnology, Krishna University Machilipatnam.
3.	Dr.k.Sucharita	M.Sc, , Ph.D	Subject Expert	I/c. Dept. of Microbiology GDC for Women(A)
4.	Mrs.K.Aruna	M.Sc, Ph.D	Subject Expert	Lecturer in Microbiology ASD GDC, Kakinada

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AGENDA FOR BOS MEETING

Type of meeting: Board Of Studies meeting in MICROBIOLOGY subject.

Facilitator: Mrs.D.Jyothi , I/c. Dept. of Microbiology.

Note Taker : Mrs.C.Dorcas Anand , Guest lecturer

Attendees: BOS Members.

Time & Date: 3.00 PM ON 20 th March 2018, Friday

Location: To be held at Dept. of Microbiology, SRR&CVR GDC

Agenda Items:

Item 1: Approval of syllabus for Semester III and IV for the Academic year 2018-19

Item 2: Approval of Question paper, blue print and model paper

Item 3: Approval for Internal assessment component, Minimum marks in internal assessment

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B.Sc. MICROBIOLOGY SEMESTER - III

(w.e.f. 2018- 2019)

MICROBIAL GENETICS AND MOLECULARBIOLOGY

BLUE PRINT FOR QUESTION PAPER

S.No	Type of Questions→ Units ↓	SA 4 marks	SA 4 marks	SA 4 marks	LA 8 marks	LA 8 marks	Total 60 Marks
		Questions given	Questions to attempt	Total marks	Questions to attempt	Total marks	Total 60 Marks
1	UNIT- I: Nucleic acids and DNA replication	2Q	Student choice	8 M	1 Q	8 M	16M
2	UNIT-II Mutations and DNA Damage	2Q		8 M	1Q	8M	16M
3	UNIT-III : Gene concept	2 Q		8M	1Q	8 M	16M
4	UNIT:IV Protein synthesis	2Q		8 M	1 Q	8 M	16M
5	UNIT- V: Genetic engineering	2Q		8M	1 Q	8 M	16M
	Total Questions to attempt	5 Q		20 M	5 Q	40 M	60 M

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Practical examination pattern for semester end examinations

(w.e.f. 2018- 2019)

Practical – I :

Practical examination in Dept. of MICROBIOLOGY is held before 3rd and 4th semester exams twice in a year to test practical skills among the students.

Total marks allotted for practical are **50** marks which are divided as 25 for internal and 25 for external for the duration of **three** hours in each semester

The division of marks is as follows

External

Major Experiment	Minor Experiment	To identify the the instrument to give the working principle	Record	VIVA
8 Marks	4 Marks	2 X 2 ½ =5 Marks	5Marks	3Marks

Internal

Record	Project viva	Continuous assessment
10 marks	10 marks	5 marks

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INTERNAL ASSESSMENTS

(w.e.f. 2018- 2019)

A total of 40 Marks is allotted for internals in Dept. of **MICROBIOLOGY**, which facilitate continuous assessment of students, to know their progress. It also facilitates the teacher to take necessary remedial activity for slow learners and to encourage the bright students by giving respective tasks.

Mid Semesters: Among the 40 marks of internals, 10 marks are given for common Written test as Mid sem exam. Two mid sem exams each of 25 marks will be conducted and the **average** is taken.

Two assignments are conducted for 10 marks,5 marks will be given for each assignment

5 marks are allotted for Student Seminars and 5 marks are allotted for continuous assessment including viva/PPT

10 marks are allotted for project work

Division of 40 Marks of Internal assessment :

1	2	3	4	5	6	5	6
1st Mid semester exam	2nd Mid semester exam	Total of Mid semester exams	Assignments	Student Seminars	Continuous assessment including viva	project	Total Marks of Internal
Written test	Written test	Average of 1 & 2 exams	2 Assignments each for 5 marks				
25marks	25 marks	10 marks	10 marks	5 marks	5 marks	10 marks	40 marks

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RESOLUTIONS

The Chairperson, Board of Studies welcomed the members and initiated discussion on the syllabus for III and IV semesters. She apprised the members of the guidelines of the UGC and the CCE regarding the framing of syllabus, and the recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

Resolutions:

1. Resolved to adopt the present University CBCS syllabus for semester III and IV, with the suggested modifications.
2. Resolved to approve the division of marks for internal and external examination along with the suggested blue print and model paper.
3. Resolved to approve the list of paper setters and examiners submitted by the department

S.NO	NAME	DESIGNATION	SIGNATURE
1.	Mrs.D.Jyothi	Chairman	D Jyothi
2.	Dr. P.V.Bramhachari	University Nominee	
3.	Dr. K.Sucharita	Subject Expert	
4.	Dr.K.Aruna	Subject Expert	20/3/18

Principal

SRR & CVR GOVT. DEGREE COLLEGE
(Autonomous)
PHONE NO : 0866-2430060
FAX NO : 0866-2441002
NAAC : B+ (III Cycle with CGPA : 2.60) - Estd: 1937
ISO 9001 - 2015 Certified
Institution is ranked by NIRF in 151 - 200 band at NIRF - 2019
WEBSITE : www.srrcvr.org
EMAIL : srrandcvr@gmail.com

BOARD OF STUDIES MEETING

(2018-2019)

20thMaech 2018

I & II B.Sc Microbiology

(With Effect from Admitted Batch 2018-2019)

DEPARTMENT OF MICROBIOLOGY

Programme Code: 313

PREFACE

SRR & CVR Govt. Degree College (A), Vijayawada, is one of the prestigious educational institutions, located in Vijayawada in Krishna District, Andhra Pradesh. Vijayawada is a place of historical and cultural significance and importance. In the same way SRR & CVR Govt. Degree College, has also acquired its significance and prominence in and around Vijayawada by molding the lives of many students to become great personalities. This college is named after late Sri Raja Rangayyappa Rao and late Sri Chunduru Venkata Reddy, who have been great and noble donors of the city Vijayawada, by whose generosity the college has reached and attained such and this elevated status by way of shaping the lives of many generations of students making them worthy citizens of the country. This college has acquired great standards academically by the contributions of great teachers as well because in the history of any educational institution its teachers play a vital role. The college was established in 1937. It offers 27 undergraduate and 10 post graduate academic programmers with 86 regular faculty members. The college has total strength of around 2,800 students. which includes 1550 boys and 650 girl students at present. The institution was accredited with grade B+ with C.G.P.A 2.6 during 2017 by NAAC.

The Department of Microbiology was established in the Academic Year 1998-99 when restructured courses were first established in selected Government Colleges. Now Department has offering UG programme Microbiology with allied subjects Biochemistry and Chemistry has sanctioned strength of 30 students. At present the Microbiology laboratory is fully equipped with instruments such as microscopes, laminar air flow, oven, incubator, refrigerator, and sufficient glassware. The department is fully furnished. The department has its own library with books in microbiology both of Indian and foreign authors. The Department is giving importance to the student centric & skill oriented programmes.

DETAILS OF COURSE TITLES & CREDITS

SEM	Course Code	Title of the Course	Course type (T/L)	Hrs./ Week (Science: 4+2)	Credits (Science: 4+2)	Max. Marks Internal	Max. Marks Sem-end Exam	Total Marks
I	MB - 1324	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	T	4	4	40	60	100
	MB - 1324 P	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	L	2	2	25	25	50
II	MB - 2324	MICROBIAL BIOCHEMISTRY AND METABOLISM	T	4	4	40	60	100
	MB - 2324 P	MICROBIAL BIOCHEMISTRY AND METABOLISM	L	2	2	25	25	50
III	MB - 3324	MICROBIAL GENETICS AND MOLECULAR BIOLOGY	T	4	4	40	60	100
	MB - 3324 P	MICROBIAL GENETICS AND MOLECULAR BIOLOGY	L	2	2	25	25	50
IV	MB - 4324	IMMUNOLOGY AND MEDICAL MICROBIOLOGY	T	4	4	40	60	100
	MB - 4324 P	IMMUNOLOGY AND MEDICAL MICROBIOLOGY	L	2	2	25	25	50

Note: *Course type code: T: Theory, L: Lab

SRR &CVR GOVT DEGREE COLLEGE (A) VIJAYAWADA: 520004
KRISHNA DISTRICT: ANDHRA PRADESH

DEPARTMENT OF MICROBIOLOGY

B.Sc Microbiology (MBC &MBF) Programme Objectives and Outcomes

Aim and objectives of UG program BSc Microbiology:

The programme BSc Microbiology introduces students to the vast array of microbes *VIZ* bacteria, archaea, viruses, fungi and protozoa around us, their diversity and applications. The programme has a strong practical emphasis, providing students with the basic laboratory skills required for a career in either applied or research microbiology.

Programme outcome

Graduates will acquire adequate knowledge and basic laboratory skills required for career in either applied or research microbiology

Programme specific outcomes

Microbiology students who graduate with a Bachelor of Science with Microbiology will

PSO1: Acquire knowledge on fundamentals of Microbiology, expertise in pure culture techniques & preservation of cultures and understand microbial physiology and biochemistry

PSO2: Gain insight into the various aspects of Microbial Genetics and r DNA technology.

PSO3: Grasp the fundamental concepts of immunity, immune response and epidemiology of microbial diseases. Demonstrate on collection and handling of laboratory specimens.

PSO4: Understand the role of microbes in nutrient recycling, sustainable agriculture culture, Microbial spoilage of food, principles of food preservation and Microbial production of Industrial products.

PSO5: Realize the application-oriented aspects of Microbiology and significance of Intellectual Property Rights

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA
B.Sc MICROBIOLGY (CBSC) SYLLABUS

BSc	MICROBIOLOGY (Semester: I)	Credits: 4
MB -1324	INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY	Hrs/Wk: 4

Aim and objectives of Course

To understand History & Development of Microbiology, Microscopy, staining and sterilization techniques, Ultra-structure of cell, Different methods of microbial characterization

To study nature of viruses, viral classification, cultivation of viruses and Type study of TMV & HIV

Learning outcomes of Course (COs)

Up on completion of the course students able to

CO1: Students will be able to illustrate the contributions made by the prominent Scientists for development of Microbiology

CO2: Students will able to differentiate a large number of bacteria by their salient characteristics

CO3: Perform pure culture techniques and techniques for preservation and maintenance of stock cultures

CO4: Understand Principles of Microscopy, handling and uses of microscopes

CO5: Analyse various techniques used for Sterilization and Disinfection techniques.

UNIT-I **No. of hours: 12**

History and mile stones in microbiology.
Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky and Winogradsky.
Importance and applications of microbiology.
Classification of microorganisms – Haeckel's three Kingdom concept, Whittaker's five kingdom concept, three domain concept of Carl Woese.
Outline classification of bacteria as per the second edition of Bergey's Manual of Systematic Bacteriology.

UNIT – II **No. of hours: 10**

General characteristics of Bacteria, Archaea, Mycoplasmas and Cyanobacteria.
Ultra structure of Prokaryotic cell- Variant components and invariant components.
General characteristics of viruses. **Cultivation of Viruses**
Morphology, Structure and replication of TMV and HIV.

UNIT-III **No. of hours: 10**

General characteristics and outline classification of Fungi, Algae and Protozoa.
Principles of microscopy - Bright field and Electron microscopy (SEM and TEM).

UNIT-IV **No. of hours: 8**

Staining Techniques –Simple and Differential (Gram Staining and Spore Staining).
Sterilization and disinfection techniques - Physical methods – autoclave, hot- air oven, pressure

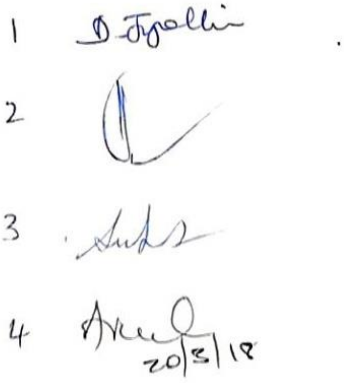
cooker, laminar air flow, filter sterilization, Radiation methods – UV rays, Gamma rays and ultra sonic methods.
Chemical methods – alcohols, aldehydes, fumigants, phenols, halogens, heavy metals, quaternary ammonium compounds and hypochlorites.

UNIT –V **No. of hours: 8**

Isolation of Microorganisms from natural habitats.
Pure culture techiques – dilution-plating, Streak-plate, Spread-plate, Pour-Plate and micromanipulator. Enrichment culturing.
Preservation of microbial cultures – subculturing, overlaying cultures with mineral oils, lyophilization, sand cultures, storage at low temperature.

Additional Inputs:

In unit-I: Contributions of Paul Ehrlich
In Unit –V: Heavy metals under chemical methods of sterilization



MB -1324 P: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 30 **CREDITS: 2**

1. Microbiology Good Laboratory Practices and Biosafety.
2. Preparation of culture media for cultivation of bacteria- Nutrient broth & Nutrient agar
3. Preparation of culture media for cultivation of fungi – Sabourauds agar
4. Sterilization of medium using Autoclave
5. Sterilization of glassware using Hot Air Oven
6. Light compound microscope and its handling
7. Microscopic observation of bacteria (Gram +ve bacilli and cocci, Gram -ve bacilli), Algae and Fungi.
8. Simple staining
9. Gram's staining
10. Hanging-drop method& temporary wet mount (TWM) for observation of living microrganisms.
11. Isolation of pure cultures of bacteria by serial dilution and Streak/Spread/Pour Plate Method.
12. Preservation of bacterial cultures by Serial subculturing & Slant Preparation with mineral oil overlay.
13. Observation of electron micrographs of bacterial cells

Recommended Text Books &Reference books:

Pelczar, M.J., Chan, E.C.S. and Kreig, N.R. (1993). Microbiology. 5th Edition, Tata McGraw Hill Publishing Co., Ltd., New Delhi.

Dube, R.C. and Maheswari, D.K. (2000) General Microbiology. S Chand, New Delhi. Edition), Himalaya Publishing House, Mumbai.
Power, C.B. and Daginawala, H.F. (1986). General Microbiology Vol I & II

Prescott, M.J., Harley, J.P. and Klein, D.A. (2012). Microbiology. 5th Edition, WCB McGrawHill, New York.

Reddy, S.M. and Reddy, S.R. (1998). Microbiology Practical Manual, 3 rd Edition, Sri Padmavathi Publications, Hyderabad.

Singh, R.P. (2007). General Microbiology. Kalyani Publishers, New Delhi.

Stanier, R.Y., Adelberg, E.A. and Ingram, J.L. (1991). General Microbiology, 5th Ed., Prentice Hall of India Pvt. Ltd., New Delhi.

Microbiology Edited by Prescott
Jaya Babu (2006). Practical Manual on Microbial Metabolisms and General Microbiology. Kalyani Publishers, New Delhi.

Gopal Reddy *et al.*, Laboratory Experiments in Microbiology

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA
B.Sc MICROBIOLGY (CBSC) SYLLABUS

BSc	MICROBIOLOGY (Semester: II)	Credits: 4
MB -2324	MICROBIAL BIOCHEMISTRY AND METABOLISM	Total hours:50

Aim and objectives of Course

To understand different bio molecular, bacterial nutrition, bacterial growth and metabolism

Learning outcomes of Course (COs)

Up on completion of this course students should able to:

CO1: Students able to describe the nutritional forms of bacteria and bacterial growth kinetics and methods to measure bacterial growth

CO2: Students will understand bacterial respiration, metabolism, photosynthesis and fermentations

CO3: Knowledge on classification of carbohydrates as structural and storage components, Classification of lipids and amino acids

CO4: Students will able to understand structure and functions of nucleic acids

CO5: Students will able to understand enzyme catalysis and kinetics

UNIT-I **No. of hours: 10**

Outline classification and general characteristics of carbohydrates (monosaccharides, disaccharides and polysaccharides).
General characteristics of amino acids and proteins.
Structure of nitrogenous bases, nucleotides
Fatty acids (saturated and unsaturated)
lipids (spingolipds, sterols and phospholipids).

UNIT-II **No. of hours: 8**

Principle and applications of -Colorimerty
Chromatography (paper and thin-layer)
Spectrophotometry (UV & visible),

UNIT-III **No. of hours: 10**

Properties and classification of Enzymes.
Biocatalysis- induced fit and lock and key models.
Coenzymes and Cofactors.
Factors affecting catalytic activity.
Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric.

UNIT-IV **No. of hours: 10**

Microbial Nutrition –Nutritional requirements and uptake of nutrients by cells.
Nutritional groups of microcroorganisms- autotrophs, heterotrophs, mixotrophs.

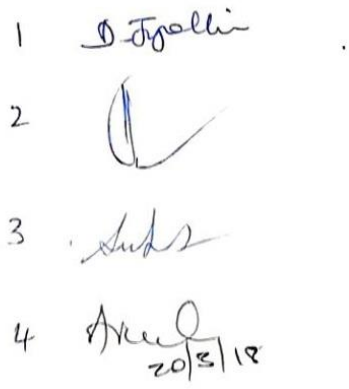
Growth media- synthetic, complex, selective, enrichment and differential media.
Microbial Growth- different phases of growth in batch cultures, Synchronous, continuous, biphasic growth.
Factors influencing microbial growth. Bacterial Growth Kinetics.
Methods for measuring microbial growth – Direct microscopy, viable count estimates, turbiodometry and biomass.

UNIT-V **No. of hours: 10**

Aerobic respiration -Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation.
Anaerobic respiration (Nitrate).
Fermentation - Alcohol and lactic acid fermentations.
Outlines of oxygenic and anoxygenic photosynthesis in bacteria.

Additional Inputs

Unit-V: Glyoxilate pathway and its significance



MB -2324 P: MICROBIAL BIOCHEMISTRY & METABOLISM

TOTAL HOURS: 38 **CREDITS: 2**

1. Qualitative Analysis of Carbohydrates
2. Qualitative Analysis of Aminoacids
3. Colorimetric estimation DNA by diphenylamine method
4. Colorimetric estimation of proteins by Biuret/Lowry method
5. Paper chromatographic separation of sugars and amino acids
6. Preparation of different media- Synthetic and Complex Media
7. Setting and observation of Winogradsky column.
8. Estimation of CFU count by spread plate method/pour plate method.
9. Bacterial growth curve.
10. Factors affecting bacterial growth – pH.
11. Factors affecting bacterial growth – Temperature.
12. Factors affecting bacterial growth –Salts

SUGGESTED READING:

Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H.Freeman and Company

Caldwell, D.R. (1995). Microbial Physiology and Metabolism, W.C. Brown Publications, Iowa, USA.

Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles of Biochemistry, 2 nd Edition, CBS Publishers and Distributors, New Delhi.

Sashidhara Rao, B. and Deshpande, V. (2007). Experimental Biochemistry: A student Companion. I.K. International Pvt. Ltd.

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA
B.Sc MICROBIOLGY (CBSC) SYLLABUS

BSc	MICROBIOLOGY (Semester: III)	Credits: 4
MB - 3324	MICROBIAL GENETICS AND MOLECULAR BIOLOGY	Total hours:48

Aim and objectives of Course

To understand DNA, RNA, Protein structure and synthesis. DNA damage, mutations and repair. Gene transfer methods.

Learning outcomes of Course (COs)

Up on completion of the course students able to

CO1: Understand the structure and functions of DNA, RNA, plasmids, transposons and bacterial replication.
CO2: Students will understand various mutations
CO3: Develop knowledge on genetic code and recombination in bacteria
CO4: Students acquire basic concepts of gene expression
CO5: Get knowledge on regulation of gene expression in prokaryotes

UNIT-I **No. of hours: 10**

DNA and RNA as genetic material.
Structure and organization of prokaryotic DNA.
Extrachromosomal genetic elements – Plasmids and transposons.
Replication of DNA – Semi conservative mechanism, Enzymes involved in replication.

UNIT-II **No. of hours: 10**

Mutations – spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions.
Mutagens - Physical and Chemical mutagens.
Outlines of DNA damage and repair mechanisms.
Genetic recombination in bacteria – Conjugation, Transformation and Transduction.

UNIT-III **No. of hours: 10**

Concept of gene – Muton, Recon and Cistron.
Types of RNA and their functions.
Genetic code. Structure of ribosomes.

UNIT-IV **No. of hours: 8**

Types of genes – structural, constitutive, regulatory
Protein synthesis – Transcription and translation.
Regulation of gene expression in bacteria – *lac* operon.

UNIT-V **No. of hours: 10**

Basic principles of genetic engineering.
Restriction endonucleases, DNA polymerases and ligases. Vectors.
Outlines of gene cloning methods.
Polymerase chain reaction. Genomic and cDNA libraries.
General account on application of genetic engineering in industry, agriculture and medicine.

Additional Inputs:
Disadvantages of GM Crops

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MB N-3324 P: MICROBIAL GENETICS AND MOLECULAR BIOLOGY

TOTAL HOURS: 48 **CREDITS: 2**

1. Study of different types of DNA and RNA using micrographs and model / schematic representations.
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*
4. Estimation of DNA using UV spectrophotometer.
5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS - PAGE).
7. Problems related to DNA and RNA characteristics, Transcription and Translation.
8. Induction of mutations in bacteria by UV light.
9. Instrumentation in molecular biology - Ultra centrifuge, Transilluminator, PCR

Recommended Text Books &Reference books:

- Freifelder, D. (1990). Microbial Genetics. Narosa Publishing House, New Delhi. Freifelder, D. (1997). Essentials of Molecular Biology. Narosa Publishing House, New Delhi.
- Glick, B.P. and Pasternack, J. (1998). Molecular Biotechnology, ASM Press, Washington D.C., USA.
- Lewin, B. (2000). Genes VIII. Oxford University Press, England.
- Maloy, S.R., Cronan, J.E. and Freifelder, D. (1994). Microbial Genetics, Jones and Bartlett Publishers, London.
- Ram Reddy, S., Venkateshwarlu, K. and Krishna Reddy, V. (2007) A text Book of Molecular Biotechnology. Himalaya Publishers, Hyderabad.
- Sinnot E.W., L.C. Dunn and T. Dobzhansky. (1958). Principles of Genetics. 5 th Edition. McGraw Hill, New York.
- Smith, J.E. (1996). Biotechnology, Cambridge University Press.
- Snyder, L. and Champness, W. (1997). Molecular Genetics of Bacteria. ASM press,
- Strickberger, M.W. (1967). Genetics. Oxford & IBH, New Delhi.
- Verma, P.S. and Agarwal, V.K. (2004). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Co. Ltd., New Delhi.

SRR & CVR GOVT. DEGREE COLLEGE (A), VIJAYAWADA
B.Sc MICROBIOLGY (CBSC) SYLLABUS

BSc	MICROBIOLOGY (Semester: IV)	Credits: 4
MB - 4324	IMMUNOLOGY AND MEDICAL MICROBIOLOGY	

Aim and objectives of Course

To study types of immunity, immune organs, cells, antibodies and antigen-antibody interactions.
To learn diagnostic and pathogenesis of various diseases. Antimicrobial defense and different toxins and vaccines.

Learning outcomes of Course (COs)

Up on completion of the course students able to

CO1: Students will demonstrate on collection, handling and processing of laboratory specimens

CO2: Develop information on epidemiology, treatment and control of infectious diseases

CO3: Student can safeguard him& society and can work diagnostics and hospitals.

CO4: Explain No-specific body defense and the immune response

CO5: Understand structure and properties of Antigen and antibodies

UNIT-I **No. of hours: 10**

Types of immunity – innate and acquired; active and passive; humoral and cell-mediated immunity.
Primary and secondary organs of immune system – thymus, bursa fabricus, bone marrow, spleen and lymph nodes.
Cells of immune system.
Identiification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils and Mast cells

UNIT-II **No. of hours: 10**

Antigens – types, chemical nature, antigenic determinants, haptens.
Factors affecting antigenicity.
Antibodies – basic structure, types, properties and functions of immunoglobulins.
Types of antigen-antibody reactions - Agglutinations, Precipitation, Neutralization, complement fixation, blood groups.
Labeled antibody based techniques – ELISA, RIA and Immunofluroscence. Polyclonal and monoclonal antibodies – production and applications.
Concept of hypersensitivity and Autoimmunity.

UNIT-III **No. of hours: 10**

Normal flora of human body.
Host pathogen interactions: infection, invasion, pathogen, pathogenicity, virulence and opportunistic infection.
General account on nosocomial infection.

General principles of diagnostic microbiology- collection, transport and processing of clinical samples.
General methods of laboratory diagnosis - cultural, biochemical, serological and molecular methods.

UNIT-IV **No. of hours: 8**

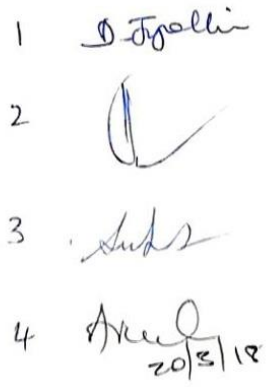
Antibacterial Agents- Penicillin, Streptomycin, streptomycin and trtracyclines
Antifungal agents – Amphotericin B, Griseofulvin
Antiviral substances - Amantadine and Acyclovir
Tests for antimicrobial susceptibility.
Brief account on antibiotic resistance in bacteria - Methicillin-resistant Staphylococcus aureus (MRSA).
Vaccines – Natural and recombinant.

UNIT-V **No. of hours: 10**

General account on microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention and control
Bacterial diseases – Tuberculosis and Typhoid
Fungal diseases – Candidiasis.
Protozoal diseases – Malaria.
Viral Diseases - Hepatitis- A and AIDS

Additional Inputs:

Unit-III: Western blotting and Sothern blotting



MB -4324 P: IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 48 **CREDITS: 2**

1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Estimation of blood haemoglobin.
4. Total Leukocyte Count of the given blood sample.
5. Differential Leukocyte Count of the given blood sample.
6. Immunodiffusion by Ouchterlony method.
7. Identify bacteria - *E. coli, Pseudomonas, Staphylococcus, Bacillus,* using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, urease production and catalase tests
8. Isolation of bacterial flora of skin by swab method.
9. Antibacterial sensitivity by Kirby-Bauer method
10. Study symptoms of the diseases with the help of photographs: Anthrax,

Polio, Herpes, chicken pox, HPV warts, Dermatomycoses (ring worms)

11. Study of various stages of malarial parasite in RBCs using permanent mounts.

Recommended Text Books &Reference books:

- Ananthanarayan R. and Paniker C.K.J. (2009) Textbook of Microbiology. 8th edition, University Press Publication.
- Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw Hill Publication.
- Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology.11th edition Wiley-Blackwell Scientific Publication, Oxford.
- Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
- Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.
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Practical Examination pattern for Semester End Examinations

Practical examination in Department of MICROBIOLOGY is held before end of semester exams twice in a year to test practical skills among the students.

Total marks allotted for practical are **50** marks which are divided as 25 for internal and 25 for external for the duration of **two** hours in each semester

The division of marks is as follows

External

Major Experiment	Minor Experiment	To identify the instrument to give the working principle	Record	Viva-Voce
8 Marks	4 Marks	2 X 2 ½ =5 Marks	5Marks	3Marks

Internal

Record	Project viva	Continuous assessment
10 Marks	10 Marks	5 Marks

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Student Evaluation Policy and Procedure

1. EVALUATION POLICY AND PROCEDURE

Students are evaluated for 100 marks in each course. These 100 Marks are spitted into Continuous Internal Assessment (CIA) and Semester End Evaluation (SEE). 40 marks are allocated to CIA and 60 marks for SEE.

CONTINUOUS INTERNAL ASSESSMENT (CIA) FOR 40 MARKS

Out of a maximum of 100 marks in each theory paper, 40 marks shall normally be allotted for continuous internal assessment. The Assessment shall be made by the teacher handling that paper in the manner prescribed here under. Where the same paper is handled by two or more teachers, the Head of the Department shall decide upon the teacher, who shall make the internal assessment or fix the proportion of the marks among the teachers for the internal assessment of the students.

Out of these 40 marks, 10 marks are allotted to Continuous Internal Exams. Two Continuous Internal exams are conducted for 20 marks in each exam and the average of these two exams scale down to 10 marks shall be deemed as the marks obtained by the student in Continuous Internal Exams.

Out of these 40 marks, 10 marks are allotted to Assignments. Two assignments are given to the students during the course. 5 marks are allotted for each assignment and total of these two assignments are included in Continuous Internal Assessment.

Out of these 40 marks, 10 marks are allotted to Project Work/ Group Discussion. Students will be assigned student study project for 10 Marks under CIA. Then the student has to submit a project report under the supervision of Faculty Member. These 10 marks may also be assigned to group discussion also. Student will be evaluated here based on his/her way of expression, conceptual strength, attitude, listening -understanding skills and level of participation in the discussion.

Out of these 40 marks, 5 marks are allotted to Student Seminar and 5 marks for Viva-Voce. Each Student may give student seminar to the peer team. This student seminar will carry 5 marks. Here feedback will be collected on 5 points scale from the participants in the student seminar [or] Viva- Voce will be conducted by the concerned subject faculty for 5marks.

The summarized continuous internal assessment is

1. Average of Two Continuous Internal exams	**-**	**10 Marks**
2. Total of Two Assignments	**-**	**10 Marks**

3. Project Work/Group Discussion	**-**	**10 Marks**
4. Student Seminar	**-**	**5 Marks**
5. Feedback/Viva-Voce	**-**	**5 Marks**

1.2 CIA IN PROJECT WORK AND COMPREHENSIVESEMINAR

Each student has to conduct Industry/Laboratory oriented Research work in his/her interested area and has to prepare Project Report by using either primary data or secondary data. This is different from student study project. It is research oriented Industrial/laboratory project conducted under the supervision of Faculty Member of the department. The students have to submit the project work report to the supervision of Faculty at the end of VI Semester End Evaluation process. After submitting project work report, the students have to give Comprehensive Seminar by explaining their research in the industry/Lab. Project Work carries 40 Marks and Comprehensive Seminar carries 10 Marks.

Every student is required, to take every test for Continuous internal Assessment, unless he/she is permitted by the Principal to write at a later date on valid reasons, before the test is conducted. In case where permission is not obtained, the decision of the Principal to hold or not to hold separate examination for such candidate is final.

Permission to write Internal Assessment test at the end of corresponding Semester – end exams may be given on medical grounds and other valid grounds. For such candidates, test/s is/are conducted by the faculty member concerned in consultation with the Head of the Department with a different question paper.

The Student has to get minimum 40 per cent (16 Marks) marks in the Continuous Internal Assessment to complete the Course Paper.

Suggestive Question paper pattern for CIA/SEE (Based on Bloom Taxonomy)

Though the faculty concerned is empowered to adopt their own pattern for question paper, a general and suggestive model for question paper is given below based on Blooms Taxonomy.

S. No	Learning Objective	Percentage of Marks
1	Memory based (Remember)	10
2	Understand (Comprehension)	10
3	Application	15
4	Analysis	15
5	Evaluation	25
6	Creativity	25
Total		**100**