HINDI MAHAVIDYALAYA

(AUTONOMOUS & NAAC RE-ACCREDITED)

(Affilitated to Osmania University)

Nallakunta, Hyderabad

2016-17 and 2017-18

BOARD OF STUDIES MEETING

DEPARTMENT OF MICROBIOLOGY

2017-2018

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
BOARD OF STUDIES
DEPARTMENT OF MICROBIOLOGY

Chairperson
Dr.Vikas Sharma
Head – Department of Microbiology
Hindi Mahavidyalaya
Nallakunta, Hyderabad.

University Nominee
Dr. Bhima Bhukya
Chairperson – BOS
Department of Microbiology
Osmania University, Hyderabad.

Members of BOS

1. Dr. P. Nagapadma
   Lecturer, Department of Microbiology
   Bharatiya Vidya Bhavans Vivekananda College of Science, Humanities, Commerce
   Sainikpuri, Hyderabad.

2. Ms. J. Sridevi
   Assistant Professor, Department of Microbiology
   Govt.Degree College for Women
   Begumpet, Hyderabad

Dept. of Micro Biology BVC

J. SRIDEVI
Asst. Professor
Department of Microbiology
Government Degree College (Women)
BEGUMPET, HYDERABAD

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)

COMPOSITION OF THE BOARD OF STUDIES IN AN AUTONOMOUS COLLEGE

I. **Composition: Department of Microbiology**

1. Head of the department concerned (Chairperson)
   Dr. Vikas Sharma – Department of Microbiology

2. The entire faculty of each specialization.
   1. Dr. Vikas Sharma
   2. P.L.Sravani

3 One expert to be nominated by the vice-chancellor from a panel if six recommended by the College Principal.

   1. Dr. Bhima Bhukya, Chairman, BOS, Department of Microbiology Osmania University.

4. Two experts in the subject from outside the college to be nominated by the Academic Council.

   1. Dr. P. Nagapadma, Lecturer, Department of Microbiology, Bharatiya Vidya Bhavan's Vivekananda College of Science, Humanities, Commerce, Sainikpuri, Hyderabad.

   2. Ms. J. Sridevi, Assistant Professor, Department of Microbiology, Govt. Degree College for Women, Begumpet, Hyderabad.

(a) Experts from outside the College whenever special courses of studies are to be formulated-To be nominated.
(b) Other members of staff of the same faculty.

Dept. of Microbiology BVC

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DEPARTMENT OF MICROBIOLOGY
AGENDA OF THE MEETING
25.07.2017, TUESDAY

2.1 Welcome address by the chair.

2.2 Previous Meeting Details.

2.3 Details of credit base choice system.

2.4 Discussion and Distribution of Common Core Syllabus for semester I, II, III, IV

2.5 Marks allotted for internal and end semester exams

2.6 Discussion of Pattern of Model Question Papers of internal exam and end semester exam for semester I, II, III, IV

2.7 Discussion on practical exam model paper.

2.8 Panel of Examiners

2.9 Any other matter

2.10 Vote of Thanks

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(AUTONOMOUS)
DEPARTMENT OF MICROBIOLOGY
BOARD OF STUDIES
Academic Year – 2017-18

Minutes of BOS Meeting

BOS meeting of the Department of Microbiology was held on 25.07.2017, Tuesday at 11AM

The following members were present

Dr. Bhima Bhukya	-	University Nominee
Dr. Vikas Sharma	-	Chairperson
Dr. P.Nagapadma	-	Member
Ms. J.Sridevi	-	Member

2.1 Welcome address by the chair

The chair welcomed the University Nominee, Chairperson BOS, O.U Department of Microbiology and Members of B.O.S.

2.2 Details of choice based credit system.

Members were informed that TSCHE has referred that from the academic year 2016-17 autonomous institutions have to follow CBCS i.e. From the Academic Year 2016-17 Osmania University has instructed all the Degree colleges including Autonomous Degree colleges to follow CBCS under which after passing the exam student will get the Grade in the Final Result. 4 Credits are given for theory paper and 1 credit is given for practical in each semester.

2.3 Discussion and Distribution of Common Core Syllabus.

i. Members were informed by the chair that Department of Microbiology, Hindi Mahavidyalaya is following common core syllabus prescribed by Osmania University for BSc I year and Bsc II year.

ii. We are following Osmania University syllabus of each Semester as it is without any changes.
Syllabus copy for I, II,III,IV semesters is enclosed.
Syllabus was approved by the Member of BOS.

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2.4 **Marks allotted for Internal and end Semester exams.**

1. Internal assessment is of 15 marks. In each Semester two internal assessment of 15 Marks each will be conducted and an average of both the internal assessments will be added in the marks of Theory exam.
2. Assignment is of 5 marks.
3. Theory Question paper is of 80 marks.
4. Total allotted marks are 100.
5. Internal assessment is of 10 marks for SEC in III and IV semseter. One internal assessment of 10 Marks will be conducted and added in the marks of Theory exam.
6. Theory Question paper for SEC is of 40 marks.
6. Total allotted marks are 50 for each SEC.

The distribution of marks was approved by the Member of BOS.

2.5 **Discussion on Pattern and Model Paper of Semester exam and Model Paper of Internal Exam**

1. It was informed by the department that in each Semester Two Internal exams will be conducted for 15 marks. The internal assessment will have three sections.
   Section –A 10 Multiple choice questions each carries ½ marks (10 x ½ = 5M),
   Section – B 10 Fill in the blanks each carries ½ marks (10 x ½ = 5M) and
   Section – C 5 short notes each 1mark (5 x 1=5M)
   Average of marks of these two internal exams will be taken. 5 marks will be allotted for assignment.

2. Semester exam will be conducted as per the Almanac which will be provided by the exam branch. Internal exam duration will be 30 Mts. and Semester exam duration will be of 3 hrs.
3. Model Question paper for Semester I, II and Semester III,IV was discussed. Theory paper for each Semester will have 2 sections.

i) Section A contains 8 short questions. The student has to answer any 4 of the questions. Each Question carries 5 Marks (4X5=20)

ii) Section B contains 4 Essay type Questions with internal choice. Each Question carries 15 Marks (4X15=60)

4. Model Question paper for SEC Semester III and Semester IV was discussed.
   Internal exams will be conducted for 10 marks. The internal assessment will have two sections.
   Section –A 10 Multiple choice questions each carries ½ marks (10 x ½ = 5M),
   Section – B 10 Fill in the blanks each carries ½ marks (10 x ½ = 5M) and

   Theory paper for each SEC will have 2 sections.
   i) Section A contains 2 short Questions. The student has to answer TWO questions. Each Question carries 5 Marks (2X5=10 Marks)
   ii) Section B contains 2 Essay type Questions with internal choice. Each Question carries 15 Marks (2X15=30 Marks)

Dept. of Micro Biology

Pattern of Model Question Papers for DSC Paper I, II and Paper III,IV are enclosed.
Pattern of Model Question Papers for SEC Paper III,IV are enclosed
Pattern of Model Question Paper was approved by Member of BOS.

2.6 Discussion on Practical Exam Model paper.

It is decided that the practical examinations held for B.Sc I year (Semester I & II) from the academic year 2017-18 onwards will have the pattern of 25 marks scheme and the credits will remain as 1 credit. The duration of the exam will be 2 hours.
It was decided in BOS meeting that 50 Marks Practical exam will be held for III & IV semester and the duration of exam will be 3 hours and 1 credit will be given for Practical in each Semester.

Pattern of Model Practical Question Papers for Paper I, II, III and Paper IV are enclosed
The Practical model paper was approved by the Member of BOS.

2.7 Panel of Examiners

The panel of examiners was approved by the members.
List is enclosed

2.8 Any other matter.

It is resolved by BOS members including Chairperson BOS Osmania University to establish a full-fledged lab for B.Sc. Microbiology practicals as per Osmania University norms.

2.9 Vote of Thanks

Meeting concluded with the Vote of Thanks by Dr.Vikas Sharma

University Nominee | Chairperson | Members | Principal

1. J. SRIDEVI
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Dept. of Micro Biology BYL

HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
CBCS Syllabus 2017- 2018
B.Sc – I year
Scheme of instruction & Evaluation

Group (Bio-chem, Micro ,Chem.) I semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (2 hrs)
BS101	Environmental studies	AECC-I	2	-	2	-	2 Hrs	40	10	50	-
BS102	English	CC-1A	5	-	5	-	3 Hrs	80	20	100	-
BS103	Second Language	CC-2A	5	-	5	-	3 Hrs	80	20	100	-
BS104	Bio-Chemistry	DSC-1A	4	2	4	1	3 Hrs	80	20	100	25
BS105	Microbiology	DSC-2A	4	2	4	1	3 Hrs	80	20	100	25
BS106	Chemistry	DSC-3A	4	2	4	1	3 Hrs	80	20	100	25
	Total				27			440	110	625	

Group (Biotech, Micro ,Chem.) I semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (2 hrs)
BS101	Environmental studies	AECC-I	2	-	2	-	2 Hrs	40	10	50	-
BS102	English	CC-1A	5	-	5	-	3 Hrs	80	20	100	-
BS103	Second Language	CC-2A	5	-	5	-	3 Hrs	80	20	100	-
BS104	Biotechnology	DSC-1A	4	2	4	1	3 Hrs	80	20	100	25
BS105	Microbiology	DSC-2A	4	2	4	1	3 Hrs	80	20	100	25
BS106	Chemistry	DSC-3A	4	2	4	1	3 Hrs	80	20	100	25
	Total				27			440	110	625	

Dept. of Micro Biology BV

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
(AUTONOMOUS)
CBCS Syllabus 2017-2018
B.Sc. 1st Year Microbiology
Semester – 1
Paper 1

Code: BSC 105	**DSC-2A**
Instruction	
Theory Classes	**4 Hrs/Week**
Practical Classes	**2 Hrs/Week**
Credit for Theory	**4**
Credit for Practical	**1**
Duration of Semester Examination	**3 Hrs**
Duration of Internal Examination	**30 Min**
Semester Examination Marks	**80 Marks**
Internal Examination Marks	**20 Marks**

Title: GENERAL MICROBIOLOGY –I

UNIT-1 (HISTROY OF MICROBIOLOGY) **15h (1 hr/week)**

1. Meaning, definition and scope of microbiology — 1 hrs
2. History of microbiology — 2 hrs
3. Contribution of Antony Van Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert koch, Iwanoswky, Beijernik, Winogradsky and Alexander Fleming. — 9 hrs
4. Importance and application of Microbiology. — 3 hrs

UNIT-2 (MICROSCOPY) **15h (1 hr/week)**

1. Principles of Microscopy-Bright field, Dark field, Phase-contrast, Fluorescent and Electron microscopy (SEM and TEM). — 6 hrs
2. Ocular and stage micrometry. Size determination of microorganisms. — 2 hrs

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3. Principles and types of stains-simple stain, differential stain, negative stain. 4 hrs
4. Structural stains-spore, capsule, flagella. Hanging drop method. 3 hrs

UNIT-3 (MICROBIOLOGICAL TECHNIQUES) 15h (1 hr/week)

1. Sterilization and disinfection techniques. Principles and methods of sterilization. 3 hrs
2. Physical methods-Autoclave,Hot air oven,pressure cooker, Laminar air flow. Filter sterilization. 3 hrs
3. Radiation methods-U.V rays, Gamma rays, Ultrasonic methods. 3 hrs
4. Chemical methods-use of Alcohols, Aldehydes, Fumigants, Phenol, Halogens and Hypochlorides, Phenol coefficient. 6 hrs

UNIT-4 (PURE CULTURES TECHNIQUES) 15h (1 hr/week)

1. Concept of pure culture techniques 1 hr
2. Isolation of Pure cultural techniques- Enrichment culturing, Dilution plating, streak plate, spread plate, Micromanipulator. 7 hrs
3. Preservation of Microbial cultures – Sub culturing, overlaying cultures with minerals oils, lyophilization, sand cultures, storage at low temperature. 7 hrs

References:

1. Michael J. Pelczar, Jr. E.C.S.Chan, Noel R. Krieg Microbiology Tata McGraw- Hill Publisher.
2. Prescott, M.J., Harly, J.P. and Klein Microbiology 5th Edition, WCB Mc GrawHill, New York.
3. Madigan, M.T., Martinkl, J.M and Parker,j. Broch Biology of Microorganism, 9th Edition, MacMillan Press, England.
4. Dube, R.C. and Maheshwari, D.K. General Microbiology S Chand, New Delhi.

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B.Sc. 1st Year Microbiology

Semester – I

Practical Paper - I

Code: BS105	
Instruction	2 Hrs / Week
Duration of Exam	2 Hrs
Marks for Exam	25 Marks
Laboratory Course	45 Hrs

GENERAL MICROBIOLOGY -I

1. Light compound microscope and its handling.
2. Calibration of microscopic measurements(ocular, stage micrometer)
3. Measuring dimensions of microorganisms (Bacteria and fungal spores)
4. Simple and differential staining (Gram stating), Spore staining, capsule staining and negative staining.
5. Preparation of culture media: Solid/Liquid.
6. Sterilization techniques: Autoclave, Hot air oven and filtration.
7. Enumeration of bacterial numbers by serial dilution and plating.
8. Microscopic observation of bacteria (Gram positive bacilli and cocci: Gram negative bacilli), cyanobacteria (nostoc,spirulina)

References:

1. Experiments in Microbiology by K.R. Aheja.
2. Gopal Reddy.M., Reddy. M.N., Sai Gopal, DVR and Mallaiah K.V. Laboratory Experiments in Microbiology.
3. Dubey, R.C. and Maheshwari, D.K. Practical Microbiology, S. Chand and Co New Delhi.
4. Alcamo, I.E. Laboratory Fundamentals of Microbiology. Jones and Bartlett Publishers, USA.

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(AUTONOMOUS)
CBCS Syllabus 2017-2018
B.Sc – I year
Scheme of instruction & Evaluation

Group (Bio-chem, Micro ,Chem.) II semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (2 hrs)
BS201	Gender Sensitization	AECC-I	2	-	2	-	2 Hrs	40	10	50	-
BS202	English	CC-1B	5	-	5	-	3 Hrs	80	20	100	-
BS203	Second Language	CC-2B	5	-	5	-	3 Hrs	80	20	100	-
BS204	Bio-Chemistry	DSC-1B	4	2	4	1	3 Hrs	80	20	100	25
BS205	Microbiology	DSC-2B	4	2	4	1	3 Hrs	80	20	100	25
BS206	Chemistry	DSC-3B	4	2	4	1	3 Hrs	80	20	100	25
	Total				27			440	110	625	

Group (Biotech, Micro ,Chem.) II semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (2 hrs)
BS201	Gender Sensitization	AECC-I	2	-	2	-	2 Hrs	40	10	50	-
BS202	English	CC-1B	5	-	5	-	3 Hrs	80	20	100	-
BS203	Second Language	CC-2B	5	-	5	-	3 Hrs	80	20	100	-
BS204	Biotechnology	DSC-1B	4	2	4	1	3 Hrs	80	20	100	25
BS205	Microbiology	DSC-2B	4	2	4	1	3 Hrs	80	20	100	25
BS206	Chemistry	DSC-3B	4	2	4	1	3 Hrs	80	20	100	25
	Total				27			440	110	625	

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CBCS Syllabus 2017-2018
B.Sc. 1st Year Microbiology
Semester – II
Paper-II

Code: BSC 205	**DSC-2B**
Instruction	
Theory Classes	**4 Hrs/Week**
Practical Classes	**2 Hrs/Week**
Credit for Theory	**4**
Credit for Practical	**1**
Duration of Semester Examination	**3 Hrs**
Duration of Internal Examination	**30 Min**
Semester Examination Marks	**80 Marks**
Internal Examination Marks	**20 Marks**

Title: GENERAL MICROBIOLOGY-II

Unit-1 (BIOLOGY OF MICROORGANISMS) — 15 h (1 hr/week)

1. Classification of living organisms; Heckel, Whittaker and carlwoese systems. — 3 hrs
2. Place of microorganisms in the living world. — 1 hr
3. Differentiation of prokaryotes and eukaryotes. — 2 hrs
4. Prokaryotes—General characteristics of bacteria, Archea bacteria, Rickettiasis, Mycoplasma,Cynobacteria and Actinomycetes. — 6 hrs
5. Classification of bacteria as per the second edition of bergyes manual of systematic bacteriology. — 3 hrs

UNIT-2 (STRUCTURE OF MICROORGANISMS) — 15 h (1 hr/week)

1. Ultra structure of bacteria cell: invariant components-cellwall, cellmembarane, ribosomes, nucleiod. Variant components-capsule, flagella, fimbriae, endospores & storage granules. — 4 hrs

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2. General characteristics and classification of virus. 2 hrs
3. Morphology and structure of TMV and HIV. 2 hrs
4. Structure and multiplication of lambda bacteriophage. 1 hr
5. Eukaryotes-General characteristics and classification. Eukaryotic microorganism-protozoa,microalgae,molds and yeast. 6 hrs

UNIT-3 (BIOMOLECULES) **15 h (1 hr/week)**

1. Outline classification and general characteristics of carbohydrate (Monosaccharides, disaccharides and polysaccharides). 5 hrs
2. General characteristics of Amino acids and proteins 4 hrs
3. Fatty acids(saturated and unsaturated) and lipids (sphingo lipids,sterols and phospholipids) 6 hrs

UNIT-4 (BIOMOLECULES) **15 h (1 hr/week)**

1. Structure of nitrogenous bases, nucleotides and nucleic acids. 3 hrs
2. Hydrgen ion concentration in biological fluids. pH measurement. 2 hrs
3. Types of buffers and their uses in biological reactions. 3 hrs
4. Principles and application of colorimetry 4 hrs
5. Principles and application of chromatography(paper and thin layer) 3 hrs

References:

1. Michael J. Pelczar, Jr. E.C.S.Chan, Noel R. Krieg Microbiology Tata McGraw- Hill Publisher.
2. Prescott, M.J., Harly, J.P. and Klein Microbiology 5th Edition, WCB Mc GrawHill, New York.
3. Madigan, M.T., Martinkl, J.M and Parker,j. Broch Biology of Microorganism, 9th Edition, MacMillan Press, England.
4. Dube, R.C. and Maheshwari, D.K. General Microbiology S Chand, New Delhi.
5. Voet, D Biochemistry WCB. Mc GrawHill, Iowa.
6. N.J. Dimmock, A.J Easton, and K.N. Leppard. Introduction to Modern Virology. Blackwell Publishing.

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
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CBCS Syllabus 2017-2018
B.Sc. 1st Year Microbiology
Semester – II
Practical Paper- II

Code: BS205	
Instruction	2 Hrs / Week
Duration of Exam	2 Hrs
Marks for Exam	25 Marks
Laboratory Course	45 Hrs

GENERAL MICROBIOLOGY-II

1. Paper chromatography-separation of sugars/amino acids
2. Determination of pH
3. Preparation of Buffers
4. Colorimetry- Principles, laws, determination of absorption maximum.
5. Microscopic observation of algae
6. Microscopic observation of fungi (sacharomyces, Rhizopus, Aspergillus, Pencillium, Fusarium)

References:

1. Experiments in Microbiology by K.R. Aheja.
2. Gopal Reddy.M., Reddy. M.N., Sai Gopal, DVR and Mallaiah K.V. Laboratory Experiments in Microbiology.
3. Dubey, R.C. and Maheshwari, D.K. Practical Microbiology, S. Chand and Co. New Delhi.
4. Alcamo, I.E. Laboratory Fundamentals of Microbiology. Jones and Bartlett Publishers, USA.
5. Mahy, B.W.J. and Kangro, H.O. Virology – Methods Manual Academic Press, USA.
6. Burleson et al Virology – A Laboratory Manual. Academic Press, USA.

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CBCS Syllabus 2017-2018
B.Sc – II year
Scheme of instruction & Evaluation

Group (Bio-chem, Micro ,Chem.) III semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (3 hrs)
BS301	SEC A/B	SEC-I	2	-	2	-	2 Hrs	40	10	50	-
BS302	English	CC-1C	5	-	5	-	3 Hrs	80	20	100	-
BS303	Second Language	CC-2C	5	-	5	-	3 Hrs	80	20	100	-
BS304	Bio-Chemistry	DSC-1C	4	2	4	1	3 Hrs	80	20	100	50
BS305	Microbiology	DSC-2C	4	2	4	1	3 Hrs	80	20	100	50
BS306	Chemistry	DSC-3C	4	2	4	1	3 Hrs	80	20	100	50
	Total				27			440	110	700	

Group (Biotech, Micro ,Chem.) III semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (3 hrs)
BS301	SEC A/B	SEC-I	2	-	2	-	2 Hrs	40	10	50	-
BS302	English	CC-1C	5	-	5	-	3 Hrs	80	20	100	-
BS303	Second Language	CC-2C	5	-	5	-	3 Hrs	80	20	100	-
BS304	Biotechnology	DSC-1C	4	2	4	1	3 Hrs	80	20	100	50
BS305	Microbiology	DSC-2C	4	2	4	1	3 Hrs	80	20	100	50
BS306	Chemistry	DSC-3C	4	2	4	1	3 Hrs	80	20	100	50
	Total				27			440	110	700	

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CBCS Syllabus 2017-2018
B.Sc. Microbiology II Year
Semester – III
Paper III

Code: BSC 305	DSC-2C
Instruction	
Theory Classes	4 Hrs/Week
Practical Classes	2 Hrs/Week
Credit for Theory	4
Credit for Practical	1
Duration of Semester Examination	3 Hrs
Duration of Internal Examination	30 Min
Semester Examination Marks	80 Marks
Internal Examination Marks	20 Marks

Title: MICROBIAL PHYSIOLOGY AND ENZYMOLOGY

UNIT-1 (MICROBIAL NUTRITION AND PHOTOSYNTHESIS) — 15h (1 hr/week)

1. Microbial Nutrition – Nutritional requirement, Uptake of nutrients by cell. — 4 hrs
2. Nutritional group of microorganisms – Autotrophs , Heterotrophs, Mixotrophs , Methylotrophs. — 4 hrs
3. Photosynthetic apparatus in Prokaryotes. — 2 hrs
4. Outline of oxygenic and anoxygenic photosynthesis in bacteria. — 5 hrs

UNIT-2 (MICROBIAL GROWTH) — 15h (1 hr/week)

1. Growth media – Synthetic, Non Synthetic, Selective, Enrichment and Differential media. — 3 hrs
2. Microbial growth – Different phases of growth in batch culture. — 2 hrs
3. Factors influencing microbial growth. — 2 hrs
4. Synchronous, Continuous, Biphasic growth. — 3 hrs

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Dept. of Micro Biology Dr.

5. Methods for measuring microbial growth – Direct Microscopic, Viable count, Turbidometry , Biomass. 5 hrs

UNIT-3 (MICROBIAL METBOLISM) **15h (1 hr/week)**

1. Aerobic respiration – Glycolysis , HMP Pathway , ED Pathway , TCA Cycle and Anaplerotic reaction. 6 hrs
2. Electron Transport , Oxidative and substrate level phosphorylation. 2 hrs
3. ß-Oxidation of Fatty acids. Glyoxylate cycle. 2 hrs
4. Anaerobic respiration (Nitrate, Sulphate respiration). 2 hrs
5. Fermentation – Common Microbial fermentation with special reference to alcohol and lactic acid fermentation. 3 hrs

UNIT-4 (ENZYMES) **15h (1 hr/week)**

1. Properties and classification of enzymes, Enzymes unit. 4 hrs
2. Biocatalysis – Induced fit, Lock & key model, Coenzymes, Co-Factors, Factors effecting catalytic reaction activity of enzymes. 6 hrs
3. Inhibition of enzymes activity – Competitive non Competitive, Uncompetitive and Allosteric. 5 hrs

References:

1. Gottschalk, G. (1986). Bacterial Metabolism, Springer-Verlag, New-York.
2. Caldwell, D.R. (1995). Microbial Physiology and Metabolism, W.C. Brown Publications, Iowa, USA.
3. Moat, A.G. and Foster, J.W. (1995). Microbial Physiology, John-Wiley, New York.
4. White, D. (1995). The Physiology and Biochemistry of Prokaryotes, Oxford University Press, New York.
5. Reddy, S.R. and Reddy, S.M. (2004). Microbial Physiology, Scientific Publishers, Jodhpur, India.
6. Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles of Biochemistry, 2nd Edition, CBS Publishers and Distributors, New Delhi.
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CBCS Syllabus 2017-2018
B.Sc. Microbiology II Year
Semester – III
Practical Paper - III

Code: BS305	
Instruction	2 Hrs / Week
Duration of Exam	3 Hrs
Marks for Exam	50 Marks
Laboratory Course	45 Hrs

MICROBIAL PHYSIOLOGY AND ENZYMOLOGY

1. Preparation of media for culturing autotrophic and heterotrophic microorganisms – algal medium, mineral salts medium , nutrient agar medium, McConkey agar and Blood agar.
2. Setting and observation of Winogradsky column
3. Methods of pure culture isolation
4. Enrichment culturing and isolation of phototrophs and chemoautotrophs.
5. Determination of viable count of bacteria.
6. Turbidometric measurement of bacterial growth.
7. Factors affecting bacterial growth – pH, temperature, salts.
8. Starch hydrolysis, Catalase test and sugar fermentation test

References:

1. Wilson, K. and Walker, J. (1994). Practical Biochemistry. 4th Edition, Cambridge University Press, England.
2. Sawhney, S.K. and Singh, R. (2000). Introductory Practical Biochemistry, Narosa Publishing House, New Delhi.
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4. Plummer, D.T. (1988). An Introduction to Practical Biochemistry. 3rd Edition, Tata Mc GrawHill, New Delhi.
5. Reddy, S.M. and Reddy, S.R. (1998). Microbiology – Practical Manual, 3rd Edition, Sri Padmavathi Publications, Hyderabad.
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B.Sc – II year
Scheme of instruction & Evaluation

Group (Bio-chem, Micro ,Chem.) IV semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (3 hrs)
BS401	SEC A/B	SEC-I	2	-	2	-	2 Hrs	40	10	50	-
BS402	English	CC-1D	5	-	5	-	3 Hrs	80	20	100	-
BS403	Second Language	CC-2D	5	-	5	-	3 Hrs	80	20	100	-
BS404	Bio-Chemistry	DSC-1D	4	2	4	1	3 Hrs	80	20	100	50
BS405	Microbiology	DSC-2D	4	2	4	1	3 Hrs	80	20	100	50
BS406	Chemistry	DSC-3D	4	2	4	1	3 Hrs	80	20	100	50
	Total				27			440	110	700	

Group (Biotech, Micro ,Chem.) IV semester

Sub Code	Course Name	Course Type	Hours / week		Credit		Exam Duration	Marks			
			Th	Pr	Th	Pr	Th/Pr	Semester end exam	Internal (30min)	Total	Practical (3 hrs)
BS401	SEC A/B	SEC-I	2	-	2	-	2 Hrs	40	10	50	-
BS402	English	CC-1D	5	-	5	-	3 Hrs	80	20	100	-
BS403	Second Language	CC-2D	5	-	5	-	3 Hrs	80	20	100	-
BS404	Biotechnology	DSC-1D	4	2	4	1	3 Hrs	80	20	100	50
BS405	Microbiology	DSC-2D	4	2	4	1	3 Hrs	80	20	100	50
BS406	Chemistry	DSC-3D	4	2	4	1	3 Hrs	80	20	100	50
	Total				27			440	110	700	

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B.Sc. Microbiology II Year
Semester – IV
Paper-IV

Code: BSC 405 DSC-2D

Instruction	
Theory Classes	4 Hrs/Week
Practical Classes	2 Hrs/Week
Credit for Theory	4
Credit for Practical	1
Duration of Semester Examination	3 Hrs
Duration of Internal Examination	30 Min
Semester Examination Marks	80 Marks
Internal Examination Marks	20 Marks

Title: MICROBIAL GENETICS AND MOLECULAR BIOLOGY

Unit-1 (MICROBIAL GENETICS) 15 h (1 hr/week)

1. Fundamentals of Genetics – Medelian laws, Alleles, Crossing over and Linkage 3 hrs
2. DNA and RNA as Genetic material 3 hrs
3. Structure of DNA – Watson and Crick model 3 hrs
4. Extra Chromosomal genetic elements – Plasmids and Transposons 3 hrs
5. Replication of DNA- Semi Conservative mechanism 3 hrs

UNIT-2 (MUTATIONS) 15 h (1 hr/week)

1. Mutations – Spontaneous and induced, Base pair changes, Frameshift , Deletion , Inversion, Tandem duplication, insertion. 4 hrs
2. Various physical and chemical mutagens 4 hrs
3. Outline of DNA Damage and repair mechanism 3 hrs
4. Brief account on gene transfer among bacteria – Transformation , Transduction and Conjugation 4 hrs

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UNIT-3 (GENE EXPRESSION)

		15 h (1 hr/week)
1.	Concept of gene – Muton , Recon and Cistron.	1 hr
2.	One gene – One enzyme , One gene – One Poly peptide , One gene – One product hypothesis	1 hr
3.	Types of RNA and their function	2 hrs
4.	Outline of RNA Biosynthesis in Prokaryotes	3 hrs
5.	Genetic Code , Structure of Ribosomes and Brief account on Protein synthesis	3 hrs
6.	Type of Genes – Structural , Constitutive , Regulatory	2 hrs
7.	Operon Concept. Regulation of Genes expression in bacteria – Lac Operon	3 hrs

UNIT-4 (RECOMBIANT DNA TECHNOLOGY)

		15 h (1 hr/week)
1.	Basic principles of genetic engineering –Restriction endonucleases	3 hrs
2.	DNA polymerases and Ligases, vectors	3 hrs
3.	Outline of gene cloning methods.	3 hrs
4.	Genomic and c DNA libraries	3 hrs
5.	General account on application of genetic engineering in industry, agriculture and medicine.	3 hrs

References:

1. Freifelder, D. (1997). Essentials of Molecular Biology. Narosa Publishing House, New Delhi.
2. Crueger, W. and Crueger, A. (2000). Biotechnology: A Text Book of Industrial Microbiology, Prentice-Hall of India Pvt. Ltd., New Delhi.
3. Glick, B.P. and Pasternack, J. (1998). Molecular Biotechnology, ASM Press, Washington D.C., USA.
4. Freifelder, D. (1990). Microbial Genetics. Narosa Publishing House, New Delhi.
5. Strickberger, M.W. (1967). Genetics. Oxford & IBH, New Delhi.
6. Sinnot E.W., L.C. Dunn and T. Dobzhansky. (1958). Principles of Genetics. 5th Edition. McGraw Hill, New York.
7. Glazer, A.N. and Nikaido, H. (1995). Microbial Biotechnology – Fundamentals of Applied Microbiology, W.H. Freeman and company, New York.
8. Old, R.W. and Primrose, S.B. (1994) Principles of Gene Manipulation, Blackwell Science Publication, New York.
9. Verma, P.S. and Agarwal, V.K. (2004). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Co. Ltd., New Delhi.

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B.Sc. Microbiology II Year
Semester – IV
Practical Paper- IV

Code: BS405	
Instruction	2 Hrs / Week
Duration of Exam	3 Hrs
Marks for Exam	50 Marks
Laboratory Course	45 Hrs

MICROBIAL GENETICS AND MOLECULAR BIOLOGY

1. Colorimetric estimation of proteins by Biuret / Lowery method.
2. Colorimetric estimation of DNA by Diphenyl amine method.
3. Colorimetric estimation of RNA by Orcinol method
4. Extraction of genomic DNA
5. Agarose gel electrophoresis
6. Problems related to DNA and RNA characteristics, Transcription and Translation

References:

1. Wilson, K. and Walker, J. (1994). Practical Biochemistry. 4th Edition, Cambridge University Press, England.
2. Sawhney, S.K. and Singh, R. (2000). Introductory Practical Biochemistry, Narosa Publishing House, New Delhi.
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4. Plummer, D.T. (1988). An Introduction to Practical Biochemistry. 3rd Edition, Tata Mc GrawHill, New Delhi.
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6. Jaya Babu (2006). Practical Manual on Microbial Metabolisms and General Microbiology. Kalyani Publishers, New Delhi.
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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD
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B.Sc I Year, Semester – I & II
MICROBIOLOGY

Scheme of Model Question Paper

Time – 3 Hrs | Max. Marks: 100

Semester Exam Pattern | 80 Marks | Duration – 3 Hrs

Section – A: 8 Short Answer Questions —— Answer any four | 5 X 4 = 20 Marks
Each carries 5 marks

Section—B: 4 Long answer questions ——with internal choice | 4 X 15 = 60 Marks
Each carries 15 Marks

Total Marks = 80

Internal Assessment Pattern | 20 Marks | Duration - 30 Min

In Internal Assessment there will be 3 sections

Sections A 10 –Multiple choice questions | 10 X ½ =5 Marks

Section –B 10—Fill in the Blanks | 10 X ½ =5 Marks

Section –C 5 - Short Answer Questions | 5 X 1= 5Marks

15 Marks

Two Internal Assessment Average is to be considered $\frac{15+15}{2}$ = 15 Marks

One Assignment to be given | 5 Marks

Internal Assessment Total | 20 Marks

Note: Equal Weightage has to be given to all units in each semester

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B.Sc II Year, Semester – III & IV
MICROBIOLOGY
Scheme of Model Question Paper

Time – 3 Hrs

Semester Exam Pattern

Max. Marks: 100

80 Marks

Duration – 3 Hrs

Section – A: 8 Short Answer Questions —— Answer any four
Each carries 5 marks — 5 X 4 = 20 Marks

Section—B: 4 Long answer questions ——with internal choice
Each carries 15 Marks — 4 X 15 = 60 Marks

Total Marks = 80

Internal Assessment Pattern

20 Marks

Duration - 30 Min

In Internal Assessment there will be 3 sections

Sections A 10 –Multiple choice questions — 10 X ½ =5 Marks

Section –B 10—Fill in the Blanks — 10 X ½ =5 Marks

Section –C 5 - Short Answer Questions — 5 X 1= 5Marks

15 Marks

Two Internal Assessment Average is to be considered $\frac{15+15}{2}$ = 15 Marks

One Assignment to be given — 5 Marks

Internal Assessment Total — 20 Marks

Note: Equal Weightage has to be given to all units in each semester

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B.Sc Microbiology I Year
Semester – I & II
Internal Examination Paper Pattern

Time – 30 Min

Total Marks: 15 Marks

Section -A

1. 10 Multiple choice type questions

10 X ½ = 5 M

Section –B

2. 10 Fill in the blanks

10 x ½ = 5 M

Section-C

3. 5 Short answer Questions

5 x 1 = 5 M

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B.Sc Microbiology II Year
Semester – III & IV
Internal Examination Paper Pattern

Time – 30 Min

Total Marks: 15 Marks

Section -A

1. 10 Multiple choice type questions — 10 X ½ = 5 M

Section –B

2. 10 Fill in the blanks — 10 x ½ = 5 M

Section-C

3. 5 Short answer Questions — 5 x 1 = 5 M

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B.Sc Microbiology I Year

Semester – I & II

Theory Question Paper Pattern

Time: 3hrs Max. Marks: 80

SECTION A

I Answer any four of the following (Short Answer questions) 4 X 5 = 20 Marks

1. A Question from Unit I
2. A Question from Unit I
3. A Question from Unit II
4. A Question from Unit II
5. A Question from Unit III
6. A Question from Unit III
7. A Question from Unit IV
8. A Question from Unit IV

SECTION B

II Essay Questions. Answer all the Questions 4 X 15 = 60 Marks

11 (a) A Question from Unit I

(OR)

(b) A Question from Unit I

12. (a) A Question from Unit II

(OR)

(b) A Question from Unit II

13. (a) A Question from Unit III

(OR)

(b) A Question from Unit III

14. (a) A Question from Unit IV

(OR)

(b) A Question from Unit IV

Note: Question Paper pattern is subjected to change as prescribed by Osmania University at later stages

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CBCS Syllabus 2017-2018

B.Sc Microbiology I Year

Semester – I & II

Practical Question Paper Pattern

Time – 2 Hrs

Total Marks: 25 Marks.

I	Major practical question	10 Marks
II	Minor practical question	5 marks
III	Identify the following spotters (5x1=5)	5 Marks
IV.	Record & Viva-Voce	5 Marks

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B.Sc Microbiology II Year

Semester – III & IV

Theory Question Paper Pattern

Time: 3hrs Max. Marks: 80

SECTION A

I Answer any four of the following (Short Answer questions) 4 X 5 = 20 Marks

1. A Question from Unit I
2. A Question from Unit I
3. A Question from Unit II
4. A Question from Unit II
5. A Question from Unit III
6. A Question from Unit III
7. A Question from Unit IV
8. A Question from Unit IV

SECTION B

II Essay Questions. Answer all the Questions 4 X 15 = 60 Marks

11 (a) A Question from Unit I

(OR)

(b) A Question from Unit I

12. (a) A Question from Unit II

(OR)

(b) A Question from Unit II

13. (a) A Question from Unit III

(OR)

(b) A Question from Unit III

14. (a) A Question from Unit IV

(OR)

(b) A Question from Unit IV

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CBCS Syllabus 2017-2018
B.Sc Microbiology II Year
Semester – III & IV
Practical Question Paper Pattern

Time – 3 Hrs

Total Marks: 50 Marks.

I.	Major practical question	20 Marks
II.	Minor practical question	10 marks
III.	Identify the following spotters (5x2=10)	10 Marks
IV.	Record	5 Marks
V.	Viva-voce	5 Marks

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B.Sc. Microbiology II Year
Semester – III
Skill Enhancement Course-I (SEC-I)

SEC-I

Code:BS 301	
Instruction	2 Hrs/Week
Theory Classes	2
Credit for Theory	2 Hrs
Duration of Semester Examination	30 Min
Duration of Internal Examination	40 Marks
Semester Examination Marks	10 Marks
Internal Examination Marks	

Title: HAEMATOLOGY

15h (1 hr/week)

UNIT-1

1. Composition of blood (RBC, WBC, Plasma, Serum, Platelet cells)
2. Staining of blood films.
3. Total blood picture, Differential count.
4. Blood grouping, Rh-typing
5. Blood hemoglobin.
6. Anticoagulants.

15h (1 hr/week)

UNIT-2

1. Blood transfusion (Principles).
2. Blood preservation.
3. Precautions of handling blood and its products.
4. Hemophilia. Anaemia.
5. General account on spread of diseases through blood and blood products.
6. ESR.

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References:

1. Kawthalkar. Essentials of Haematology Paperback – 2013
2. Lokwani. D.P. The ABC of CBC Interpretation of Complete Blood Count and Histograms Paperback – 2013
3. Ramnik Sood . Medical Laboratory technology Methods and Interpretation Jaypee Publications.
4. Shirish M Kawthalkar. Essential Of Hematology. Jaypee Publications.

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B.Sc. Microbiology II Year
Semester – IV
Skill Enhancement Course-II (SEC-II)

Code:BS 401	**SEC-II**
Instruction	
Theory Classes	**2 Hrs/Week**
Credit for Theory	**2**
Duration of Semester Examination	**2 Hrs**
Duration of Internal Examination	**30 Min**
Semester Examination Marks	**40 Marks**
Internal Examination Marks	**10 Marks**

Title: FOOD ADULTERATION

UNIT-1 — 15h (1 hr/week)

1. Definition and Introduction to food adulteration.
2. Types of Food Adulteration
3. Common Food adulterants
4. Causes of Food adulteration
5. Analysis of food

UNIT-2 — 15h (1 hr/week)

1. Effects of Food Adulteration
2. Prevention of Food adulteration
3. Detection of Common food Adulterants.
4. Food Adulteration act-1954

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References:

1. Jesse Park Battershall. Food adulteration and its detection . Published by Book on Demand, Miami, 2015

2. R. B. Sethi's Prevention of food adulteration act

3. Dr. Sheela.S. Prevention of Food Adulteration

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B.Sc Microbiology II Year (Semester – III & IV)
Skill Enhancement Course (SEC)

Internal Examination Paper Pattern

Time – 30 Min | Total Marks: 10 Marks

Section -A

1. 10 Multiple choice type questions — 10 X ½ = 5 M

Section –B

2. 10 Fill in the blanks — 10 x ½ = 5 M

Note: Question Paper pattern is subjected to change as prescribed by Osmania University at later stages

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B.Sc Microbiology II Year
Semester – III & IV
Skill Enhancement Course (SEC)

Theory Question Paper Pattern

Time: 2hrs **Max. Marks: 40**

SECTION A

I Answer the following (Short Answer questions) **2 X 5 = 10 Marks**

1. A Question from Unit I
2. A Question from Unit II

SECTION B

II Essay Questions. Answer all the Questions **2 X 15 = 30 Marks**

3. (a) A Question from Unit I
   (OR)
   (b) A Question from Unit I

4. (a) A Question from Unit II
   (OR)
   (b) A Question from Unit II

Note: Question Paper pattern is subjected to change as prescribed by Osmania University at later stages

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