

# HINDI MAHAVIDYALAYA

(AUTONOMOUS & NAAC RE-ACCREDITED)

(Affiliated to Osmania University)

Nallakunta, Hyderabad



**B.Sc. II YEAR SEMESTER III & IV**  
**DEPARTMENT OF MICROBIOLOGY**  
**(2021-2022)**

# HINDI MAHAVIDYALAYA

(AUTONOMOUS & NAAC RE-ACCREDITED)

BOARD OF STUDIES

DEPARTMENT OF MICROBIOLOGY

## Chairperson

Ms. Pallavi Jutika  
Head- Department of Microbiology  
Hindi Mahavidyalaya  
Nallakunta, Hyderabad

*J. Pallavi*  
Department of Microbiology  
Hindi Mahavidyalaya  
(AUTONOMOUS & NAAC REACCREDITED)  
Nallakunta, Hyderabad-44.

## University Nominee

Dr. Bhukya Bhima  
Associate Professor,  
Head and Chairperson, BOS  
Department of Microbiology,  
Osmania University, Hyderabad

*Dr. B. Bhima*  
Dr. B. Bhima  
Chairman, BoS  
Dept. of Microbiology  
Osmania University, Hyd.

## Members of BOS

1. Dr. K. Anuradha  
Head of the department  
Department of Microbiology  
Bhavan's Vivekananda College of Science Humanities and Commerce,  
Hyderabad

2. Dr. Sreedevi  
Head of the department  
Department of Microbiology  
St. Pious Degree and PG College  
Hyderabad.

*Sreedevi*

## Chairperson

*J. Pallavi*  
Department of Microbiology  
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## University Nominee

*Dr. B. Bhima*  
Dr. B. Bhima  
Chairman, BoS  
Dept. of Microbiology  
Osmania University, Hyd.

## Members

1. *Anuradha*  
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*Sreedevi*  
PRINCIPAL  
HINDI MAHAVIDYALAYA  
(AUTONOMOUS)  
Arts, Commerce & Science  
Nallakunta, 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 (Chairman)  
Ms. Pallavi Jutika, Head-Department of Microbiology
  2. The entire faculty of each specialization
    1. Ms. Pallavi Jutika
  3. One expert to be nominated by the Vice Chancellor from a panel of six recommended by the College Principal
    1. Dr. Bhukya Bhima, University Nominee, Head and Chairperson BOS, Dept. of Microbiology, Osmania University, Hyderabad.
  4. Two experts on the subject from outside the college to be nominated by the Academic Council.
    1. Dr. S. Sreedevi, Head of Microbiology Department, St. Pious X Degree & PG College for women, Snehapuri Colony, Opp. HMT Bus stop, Near Habsiguda, Nacharam Road, Hyderabad.
    2. Dr. K. Anuradha, Head of Microbiology Department, Bhavan's Vivekananda College of Science, Humanities & Commerce Sainikpuri, Hyderabad.
  5. One postgraduate meritorious alumnus to be nominated by the Principal. The Chairman, Board of Studies, may with the approval of the Principal of the College.
    1. Dr. G. Madhusudhan Reddy
    2. Smt. Vemula Sreelatha
- (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.

PRINCIPAL  
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**HINDI MAHA VIDYALAYA, NALLAKUNTA, HYDERABAD**  
**(AUTONOMOUS)**  
**DEPARTMENT OF Microbiology**  
**AGENDA OF THE MEETING**

- 4.1 Welcome address by the chair.
- 4.2 Previous Meeting Details.
- 4.3 Details of choice based credit system.
- 4.4 Discussion and Distribution of Common Core Syllabus for all the Semesters (III and IV) .
- 4.5 Marks allotted for internal and end semester exams.
- 4.6 Discussion on Pattern and model paper of Semester Exam and internal exam for all the Semesters (III and IV)
- 4.7 Discussion on Practical exam model paper for all the Semesters (III and IV)
- 4.8 Panel of Examiners
- 4.9 Any other matter
- 4.10 Vote of thanks

*J. Pallavi*

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Dr. B. Bhima  
Chairman, BoS  
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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD**  
**(AUTONOMOUS)**  
**DEPARTMENT OF MICROBIOLOGY**  
**BOARD OF STUDIES**  
**Academic Year – 2021-2022**  
**Minutes of BOS Meeting**

BOS meeting of the Department of Microbiology was held on  
 ....12.12.2021.....

The following members were present

Dr. Bhukya Bhima	-	University Nominee
Ms.J.Pallavi	-	Chair person
Dr. S Sreedevi	-	Member of BOS
Dr.K. Anuradha	-	Member of BOS

**1.1 Welcome address by the chair**

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

**1.2 Previous Meeting details**

The CBCS system has been introduced by Osmania University from 2016-17. The theory and practical syllabus of I, II & III years of B.Sc., question paper pattern for theory and practical, internal assessment pattern, practical examination scheme and panel of examiners were discussed and approved by all the BOS Members in previous BOS meeting.

**1.3 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.

**1.4 Discussion and Distribution of Common Core Syllabus for semesters III and IV.**

- i. Members were informed by the chair that Department of Microbiology, Hindi Mahavidyalaya is following common core syllabus prescribed by Osmania University with few changes for B.Sc. II YEAR in III and IV semesters.
- ii. The syllabus comprise of 4 units.
- iii. The following are the changes in the syllabus semester III

Head of the Department  
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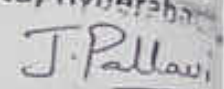


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 Ghazalra V. Education Institutions College  
 Santhapuri, Nallakunta - 500 076.




Dr.B.Bhima  
 Chairman,BoS  
 Dept of Microbiology  
 Osmania University  
 Department of Microbiology  
 Hindi Mahavidyalaya  
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 Nallakunta, Hyderabad





**\*Unit-2**

Government regulatory policies and practices, FSSAI, FDA, HACCP, ISI.

**\*Unit 3**

Anaerobic sewage treatment-septic tank

Aerobic sewage treatment- oxidation ponds, trickling filters, activated sludge treatment

**\*Unit-4**

Biofertilizers- Rhizobium, Biopesticides-Bacillus thuringensis

The following are the changes in the syllabus in semester IV

**\*Unit 2**

Zoonotic diseases-japanese encephalitis

**\*Unit 4**

Vaccines-Natural and recombinants

iv. Syllabus copy for both the semesters is enclosed.

v. Syllabus was approved by the Members of BOS.

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

1. Internal assessment is of 30 marks in which 20 marks are for online test, where students have to answer 20 MCQs in 25 minutes. Each question carries 1 mark. In each Semester two online tests of 20 Marks will be conducted and an average of both the tests will be added in the marks of theory exam.
2. Theory Question paper is of 70 marks.
3. Total allotted marks are 70 for each theory paper (III & IV).
4. Internal assessment is of 15 marks for SEC. One online internal assessment of 15 Marks will be conducted and added in the marks of Theory exam.
5. Theory Question paper for SEC is of 35 marks.
6. Total allotted marks are 50 for each SEC

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

**1.6 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 Online tests will be conducted for DSC of 20 marks. The continuous internal assessment will have three sections.

- Section - A 20 multiple choice questions each carries 1 mark (20 x 1 = 20M).
- Section - B Assignment - 5 Marks
- Section - C Seminar - 5 Marks

Average of marks of these two online tests will be taken.

2. It was informed by the department that in each Semester one Online test will be conducted for SEC of 15 marks. The internal assessment will have 15 Multiple choice questions each carries 1 mark (15 x 1 = 15M).

3. Semester exam will be conducted as per the Almanac which will be provided by the exam branch. Internal exam duration will be 30 Min and Semester exam duration will be of 2 1/2 hrs.

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Head of the Department  
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Sainikpally, Chaitanyam, Hyd-77

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Chairman, BOS

Dept. of Microbiology  
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Department of Microbiology  
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(AUTONOMOUS & NAAC DEACCREDITED)

4. Model Question paper for Semester III and Semester IV was discussed. Theory paper for each Semester will have 2 sections.
- Section A contains 8 short Questions. The student has to answer six questions. Each Question carries 3 Marks (6X3=18 Marks)
  - Section B contains 4 Essay type Questions with internal choice. Each Question carries 13 Marks (4X13=52 Marks)
5. Model Question paper of SEC for Semester III and Semester IV was discussed. Theory paper for each SEC will have 2 sections.
- Section A contains 4 short Questions. The student has to answer THREE questions. Each Question carries 5 Marks (3X5=15 Marks)
  - Section B contains 2 Essay type Questions with internal choice. Each Question carries 10 Marks (2X10=20 Marks)

### 1.7 Discussion on Practical Exam Model paper.

- It is decided that the practical examinations held for B.Sc second year (Semester III & IV) from the academic year 2021-22 onwards will have the pattern of 25 marks scheme and the credits will remain the same i.e. 1 credit. The duration of the exam will be 3 hours.
- Pattern of Model Practical Question Papers for Paper III and Paper IV are enclosed.
- Pattern of Model Practical Question Papers was approved by Members of BOS

### 1.8 Panel of Examiners

The panel of examiners was approved by the members.

- List is enclosed

### 1.9 Any other matter.

### 2.0 Vote of Thanks

Meeting concluded with the Vote of Thanks by J.Pallavi

Chairperson

*J. Pallavi*

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University Nominee

Dr. B. Bhini

Chairman, BOS  
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Osmania University, Hy.

Members

Head of the Department

Department of Microbiology  
Sheriff's College, Nallakunta, Hyderabad

2.

Responsible Department  
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## CBCS STRUCTURE FOR 2020-2021 BATCH

B.Sc-BIOTECHNOLOGY/BIOCHEMISTRY, MICROBIOLOGY, CHEMISTRY  
ACADEMIC YEAR 2020-2021

SECOND YEAR SEMESTER - III				Semester End Exam		Continuous Internal Evaluation		Total	Practical 3 hours
Course Title	Course Type	HPW	Credits	Duration in Hours	Marks	Exam Duration	Marks		
SEC - 1	SEC-1	2	2	1 1/2	35	20 min.	15	50	
SEC - 2	SEC-2	2	2	1 1/2	35	20 min	15	50	
English-III	CC-1C	4 <sup>3</sup>	4 <sup>3</sup>	2 1/2	70	30 min.	30	100	
Second Language-III	CC-2C	4 <sup>3</sup>	4 <sup>3</sup>	2 1/2	70	30 min.	30	100	
Biotechnology/Biochemistry-III	DSC-1C	4T+3 P=7	4+1 =5	2 1/2	70	30 min	30	100	25
Microbiology III - Food and Environmental Microbiology	DSC-2C	4T+3 P=7	4+1 =5	2 1/2	70	30 min	30	100	25
Chemistry-III	DSC-3C	4T+3 P=7	4+1 =5	2 1/2	70	30 min	30	100	25
		33	27		425		175	675	

Chairperson

*J. Pallavi*

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Hindi Mahavidyalaya  
Nallakunta, Hyderabad-44.

University Nominee

Dr. B. B. ...  
Chairman, Board  
Dept. of Microbiology  
Osmania University, Hyderabad

Members

Head of the Department of Microbiology  
1. ...  
2. ...  
3. ...

Head of the Department  
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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD  
(AUTONOMOUS)

B.Sc. II Year Semester - III

Microbiology Paper III - Food and Environmental Microbiology

Code: BS305

DSC-2C

Instruction

4 Hrs/Week

Theory Classes

4

Credit for Theory

1

Credit for Practical

2 1/2 hrs

Duration of semester examination

30 mins

Duration of internal examination

70 marks

Semester examination marks

30 marks

Internal marks

**Learning Outcome:** Students will understand beneficial role of microbes in fermented food, food processing and spoilage mechanisms of microbes, understand the basic food safety regulations and learn the occurrence, abundance of microbes in environment and their role, understand various plant microbe interactions, learn various methods in determining sanitary quality of water and sewage treatment methods.

**UNIT - 1 - FERMENTED FOODS**

- 1.1. Introduction to fermented foods.
- 1.2. Health aspects of fermented foods.
- 1.3. Fermented vegetables: Processing and fermentation of Sauerkraut and pickles, idly.
- 1.4. Dairy microbiology - types of micro-organisms in milk, significance of microorganisms in milk.
- 1.5. Microbial products of milk- Bulgarian milk, kefir, cheese, yogurt.
- 1.6. Microorganisms as food; Probiotics and prebiotics.

**UNIT - 2 - MICROBIAL FOOD SPOILAGE AND POSIONING**

- 2.1. Microbial spoilage of food.
- 2.2. Microbial food poisoning, risks and hazards.
- 2.3. Mycotoxins and their poisoning/ toxicity.
- 2.4. Food preservation methods and food safety issues.
- 2.5. Food quality : Importance and functions of quality control.
- 2.6. Methods of quality assessment of foods.
- 2.7. Screening and enumeration of spoilage microorganisms, Detection of pathogens in food.
- 2.8. Government regulatory policies and practices, FSSAI, FDA, HACCP, ISI.

Head of the Department

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J.P.R.  
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Nallakunta, Hyderabad

### UNIT - 3 - AIR AND WATER MICROBIOLOGY

- 3.1 Microorganisms in air and their importance (brief account)
- 3.2. Microorganisms and water pollution
- 3.3. Water-borne pathogenic microorganisms and their transmission;
- 3.4. sanitary quality of water;
- 3.5. Water pollution due to degradation of organic matter;
- 3.6. Aerobic sewage treatment - Oxidation ponds, trickling filters, activated sludge treatment and Anaerobic sewage treatment - Septic tank.

### UNIT - 4 - SOIL MICROBIOLOGY

- 4.1. Soil Properties - (Physical, chemical and biological), Soil microorganisms
- 4.2. Methods of enumeration and activity of microbes in environment/soil;
- 4.3. Microbes and plant interaction - Rhizosphere, phyllosphere, and Mycorrhizae;
- 4.4. Introduction to Microbial Bioremediation, Microbial degradation of organic pollutants;
- 4.5. Carbon and Nitrogen cycle,
- 4.6. Biofertilizers - Rhizobium, Biopesticides - Bacillus thuringensis.

### REFERENCE BOOKS

1. Stanbury, P.F., Whittaker, A. and Hall, S.J. (1997). Principles of Fermentation technology, Aditya Books (P) Ltd. New Delhi.
2. Doyle, M.P., Beuchat, L.R. and Montville, T.J. (1997). Food microbiology: Fundamentals and Frontiers. ASM press, Washington D.C., USA.
3. Frazier, W.C. and Westhoff, D.C. (1988). Food Microbiology, McGraw-Hill, New York.
4. Jay, J.M. (1996). Modern Food Microbiology, Chapman and Hall, New York.
5. Ray, B. (1996). Fundamentals of food microbiology, CRC press USA.
6. Rangaswamy, G. and Bhagyaraj, D.J. (2001). Agricultural microbiology, second edition, prentice hall of India, New Delhi.
7. Atlas, R.M. and Bartha, R. (1998). Microbial ecology - Fundamentals and applications, Addison Wesley longman. inc., USA.
8. Paul, E.A. and Clark, F.E. (1989). Soil Microbiology and biochemistry, Academic press, USA.

*J. Pallavi*

Chairperson  
Department of Microbiology  
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University Nominee  
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Members

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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD**  
**(AUTONOMOUS)**  
**B.Sc. II Year Semester – III**  
**Microbiology Paper III**

Practical Classes  
 Credit for Practical

3 Hrs/Week  
 1

**CORE-III: Practicals: Food and Environmental Microbiology**

1. Determination of microbiological quality of milk by MBRT method. ✓✓
2. Isolation of fungi and bacteria from spoil fruits / vegetables/milk/meat products.
3. Isolation of microorganisms from air by impingement method.
4. Microbiological examination of water by coliform test. ✓
5. Determination of biological oxygen demand. ✓
6. Extraction of mycotoxins from contaminated grains/foods.
7. Detection of mycotoxins.
8. Isolation and identification of probiotic bacteria.
9. Isolation and identification of probiotic yeast.

**Reference Books:**

1. Stanbury, P.F., Whittaker, A. and Hall, S.J. (1997). Principles of Fermentation technology, Aditya Books (P)Ltd. New Delhi.
2. Doyle, M.P, Beuchat, L.R and Montville, T.J (1997). Food microbiology: Fundamentals and Frontiers. ASM press, Washington D.C., USA.
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4. Jay, J.M. (1996). Modern Food Microbiology, Chapman and Hall, New York.
5. Ray .B. (1996). Fundamentals of food microbiology, CRC press USA.
6. Atlas, R.M. and Bartha, R. (1998). Microbial ecology-Fundamentals and applications, Addison wesley longman. Inc .USA.

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 Chairperson  
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**Members**

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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD**  
**(AUTONOMOUS)**  
**B.Sc. II Year Semester - III**  
**SKILL ENHANCEMENT COURSE - I (SEC - 1)**  
**TITLE - HAEMATOLOGY**

SEC - 1

Code: BS301

Instruction

Theory Classes

Credit for Theory

Duration of semester examination

Duration of internal examination

Semester examination marks

Internal marks

2 Hrs/Week

2

1 1/2 hrs

15 mins

40 marks

15 marks

**UNIT - 1 - INTRODUCTION TO BLOOD**

- 1.1. Blood : definition, characters, composition
- 1.2. Collection of blood - Capillary blood: from adults and infants, examination employed.
- 1.3. Venous blood: from adults and infants, examination employed.
- 1.4. Composition of blood (RBC, WBC, Plasma, Serum, Platelets cells)
- 1.5. Staining of blood films
- 1.6. Total blood picture, Differential count, Blood grouping, Rh - typing.
- 1.7. Haemoglobin: Composition and normal values
- 1.8. Haemoglobin estimation Anti-coagulants

**UNIT - 2 - BLOOD TRANSFUSION**

- 2.1. Principles of blood transfusion
- 2.2. Donor screening - cross matching, collection of blood, preservation and storage.
- 2.3. Precautions of handling blood and its products.
- 2.4. Challenges in management of Haemophilia and Anaemia
- 2.5. General account on spread of diseases through blood and blood products.
- 2.6. Coagulation mechanism : factors, bleeding time, clotting time.
- 2.7. Haematological indices: packed cell volume
- 2.8. Erythrocytes sedimentation: principle - determination

**REFERENCES:**

1. Kawtahalkar. Essentials of Haematology paper back - 2013
2. Lokawani. D. P. The ABC of CBC Interpretation of complete blood count and histograms paperback - 2013
3. Ramniksood. Medical laboratory technology methods and interpretation Jaypee Publications
4. Shirish MKawatahalkar . Essentials of Haematology . Jaypee Publications

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD  
(AUTONOMOUS)  
B.Sc Microbiology- II ndYear  
Semesters - III - Paper - III  
Theory Model Question Paper

Max. Marks: 70

Time: 2 1/2 hrs

SECTION A

I Write short notes on any Six of the following:

6X3 = 18 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

4 X 13 = 52 Marks

II Answer all the Questions.

- 9 (a) A question from Unit I  
( OR )  
(b) A question from Unit I
- 10 (a) A question from Unit II  
( OR )  
(b) A question from Unit II .
- 11 (a) A question from Unit III.  
( OR )  
(b) A question from Unit III.
- 12 (a) A question from Unit IV  
( OR )  
(b) A question from Unit IV.

Chairperson

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD  
 (AUTONOMOUS)  
 B.Sc Microbiology- 2nd Year  
 Semester - III - Paper - III  
 Practical Model Question Paper

Max. Marks: 25

Time: 3 hrs

- |      |                  |    |    |    |            |
|------|------------------|----|----|----|------------|
| I.   | Major experiment |    |    |    | (10 Marks) |
| II.  | Minor experiment |    |    |    | (5 Marks)  |
| III. | Spotting         |    |    |    | (5 Marks)  |
|      | 1)               | 2) | 3) | 4) | 5)         |
| IV.  | Viva & Record    |    |    |    | (5 Marks)  |

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# HINDI MAHAVIDYALAYA

(AUTONOMOUS)  
 Affiliated to Osmania University, Nallakunta, Hyderabad-44  
**CBCS STRUCTURE FOR 2020-2021 BATCH**  
 B.Sc-BIOTECHNOLOGY/BIOCHEMISTRY, MICROBIOLOGY, CHEMISTRY  
 ACADEMIC YEAR 2020-2021

SECOND YEAR SEMESTER - IV					Semester End Exam		Continuous Internal Evaluation		Total	Practical Hours
Code	Course Title	Course Type	HPW	Credits	Duration in Hours	Marks	Exam Duration	Marks		
BS401	SEC - 3	SEC - 3	2	2	1 1/2	35	20 min.	15	50	
BS402	SEC - 4	SEC - 4	2	2	1 1/2	35	20 min	15	50	
BS403	English-IV	CC-1D	4	4	2 1/2	70	30 min.	30	100	
BS404	Second Language-IV	CC-2D	4	4	2 1/2	70	30 min	30	100	
BS405	Biotechnology/Bio-chemistry-IV	DSC-1D	4T+3P =7	4+1 =5	2 1/2	70	30 min	30	100	25
BS406	Microbiology-IV Medical Microbiology and Immunology	DSC-2D	4T+3P =7	4+1 =5	2 1/2	70	30 min	30	100	25
BS407	Chemistry-IV	DSC-3D	4T+3P =7	4+1 =5	2 1/2	70	30 min	30	100	25
			33	27		425		175	675	

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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD**  
(AUTONOMOUS)  
B.Sc. II Year Semester - IV

**Microbiology Paper IV -MEDICAL MICROBIOLOGY AND IMMUNOLOGY**

Code: BS405	DSC -2D
Instruction	
Theory Classes	4 Hrs/Week
Practical Classes	3 Hrs/Week
Credit for Theory	4
Credit for Practical 1	
Duration of semester examination	2 1/2 hrs
Duration of internal examination	30 mins
Semester examination marks	70 marks
Internal marks	30 marks


**Learning Outcome:** Students will gain knowledge on Medical microbiology and virology, and get to know about diseases which will be beneficial in developing practical skills.


**UNIT - 1 - MEDICAL BACTERIOLOGY**


- 1.1. History of medical microbiology.
- 1.2. Normal flora of human body, Host pathogen interactions.
- 1.3. Bacterial toxins, virulence and attenuation. Antimicrobial resistance.
- 1.4. Air borne diseases- Tuberculosis.
- 1.5. Food and water borne diseases- Cholera, Typhoid.
- 1.6. Contact diseases- Syphilis, Gonorrhoea.
- 1.7. General account of Nosocomial infections.

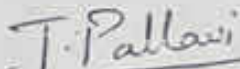
**UNIT - 2 - MEDICAL VIROLOGY AND PARASITOLOGY**

- 2.1. Food and water borne diseases- Poliomyelitis, amebiasis.
- 2.2. Insect borne diseases- Malaria, Dengue fever.
- 2.3. Zoonotic diseases- Rabies, Japanese encephalitis.
- 2.4. Viral diseases- Hepatitis-B, HIV, SARS, MERS; Air borne diseases- Influenza.

  
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### UNIT - 3 - INTRODUCTION TO IMMUNOLOGY

- 3.1. History of immunology.
- 3.2. Cells and organs of immune system- Primary and secondary lymphoid organs.
- 3.3. Functions of B and T lymphocytes, Natural killer cells, polymorphonuclear cells.
- 3.4. Structure and Classification of antigens, Factors Affecting antigenicity.
- 3.5. Antibodies- Basic structure, types, properties and functions of immunoglobulins.
- 3.6. Types of immunity- Innate and Acquired; Humoral and cell mediated immune response.
- 3.7. Major histocompatibility complex- Class-I and II.

### UNIT - 4 - IMMUNOLOGICAL DISORDERS AND Ag - Ab REACTIONS

- 4.1. Types of hypersensitivity- Immediate and delayed.
- 4.2. Systemic and localised autoimmune disorders.
- 4.3. Complement pathways- Classical and alternate.
- 4.4. Types of Antigen- Antibody reactions- Agglutination, Blood groups, Precipitation, Neutralization, Complement fixation test
- 4.5. labelled antibody based techniques- ELISA, RIA, and Immunofluorescence
- 4.6. Polyclonal and monoclonal antibodies production and application.
- 4.7. Vaccines- Natural and recombinants.

### REFERENCE BOOKS

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, Second edition, C.B.S publishers and distributors, New Delhi.
7. Elliot, W.H. and Elliot, D.C. (2001). Biochemistry and molecular biology, second edition, oxford university press, USA.

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**HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD**  
**(AUTONOMOUS)**  
**B.Sc. II Year Semester - IV**  
**Microbiology Paper IV**

Practical Classes  
 Credit for Practical

3 Hrs/Week  
 1

**PRACTICALS: MEDICAL MICROBIOLOGY AND IMMUNOLOGY**

1. Determination of blood grouping and RH typing. ✓
2. Total count of RBC and WBC. ✓
3. Differential count of blood leucocytes.
4. WIDAL test for typhoid (slide test) by Ag-Ab reactions. ✓
5. VDRL test for syphilis (slide test) by Ag-Ab reactions. ✓
6. Ouchterlony double diffusion test.
7. Separation of serum and plasma.
8. IMVIC tests- Indole test, Methyl red test, Vogues proskauer test, citrate utilization test. ✓
9. Oxidase test. ✓
10. Catalase test. ✓
11. Antibiotic sensitivity testing - Disc diffusion method. ✓

**REFERENCE BOOKS**

1. Experiments in Microbiology by K.R. Aneja.
2. GopalReddy.M., Reddy. M.N., SaiGopal, DVR and Mallaiah K.V. Laboratory Experiments in Microbiology. Himalaya publishing house, Mumbai.

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B.Sc. II Year Semester - IV  
**SKILL ENHANCEMENT COURSE - II (SEC - 2)**  
**TITLE - MUSHROOM CULTIVATION**

SEC - 2

Code: BS401

Instruction

Theory Classes

Credit for Theory

Duration of semester examination

Duration of internal examination

Semester examination marks

Internal marks

2 Hrs/Week

2

1 1/2 hrs

15 mins

40 marks

15 marks

**UNIT - 1**

- 1.1. Introduction to mushroom cultivation
- 1.2. Importance and History of Mushroom cultivation in India
- 1.3. Global status of Mushroom production
- 1.4. Edible Mushrooms ( White button Oyster, Paddy straw)
- 1.5. Nutritional value and health benefits of Mushrooms

**UNIT - 2**

- 2.1. Steps in Mushroom cultivation
  - a. Selection of site and types of Mushrooms
  - b. Mushroom farm structure, design layout
  - c. Principle and techniques of compost and composting
  - d. Principle of spawn production
  - e. Casing and crop production
  - f. Harvesting and marketing
  - g. Entrepreneurship development in Mushroom cultivation
- 2.2. Pest and pathogens of mushroom
- 2.3. Post harvest handling and prevention of mushrooms

**REFERENCES**

1. Mushroom cultivation in India by B.C.Suman and V.P. Sharma Published by Daya Publishing House .New Delhi
2. Mushrooms cultivation, Marketing and Consumption Manjit Singh Bhuvnesh Vijay Shwet Kamal G.C. Wakchaure Directorate of Mushroom Resaerch (Indian Conucil of Agricultural Research) Chambaghat, Solan - 173213 (HP)

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD  
(AUTONOMOUS)  
B.Sc Microbiology- 2<sup>ND</sup>Year  
Semesters – IV- Paper – IV  
Theory Model Question Paper

Time: 2 1/2 hrs

Max. Marks: 70

SECTION A

Write short notes on any Six of the following:

6X3 =18Marks

9. A question from Unit I
10. A question from Unit I
11. A question from Unit II
12. A question from Unit II
13. A question from Unit III
14. A question from Unit III
15. A question from Unit IV
16. A question from Unit IV

SECTION B

Answer all the Questions.

4 X 13= 52 Marks

- (a) A question from Unit I  
( OR )
- (b) A question from Unit I
- (a) A question from Unit II  
( OR )
- (b) A question from Unit II .
- (a) A question from Unit III.  
( OR )
- b) A question from Unit III.
- a)A question from Unit IV  
( OR )
- b) A question from Unit IV.

person

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD  
 (AUTONOMOUS)  
 B.Sc Microbiology- IInd Year  
 Semester - IV- Paper - IV  
 Practical Model Question Paper

Max. Marks: 25

Time: 3 hrs

- |                      |  |  |  |  |           |
|----------------------|--|--|--|--|-----------|
| I. Major experiment  |  |  |  |  | (10Marks) |
| II. Minor experiment |  |  |  |  | (5 Marks) |
| III. Spotting        |  |  |  |  | (5 Marks) |
| 1) 2) 3) 4) 5)       |  |  |  |  | (5 Marks) |
| IV. Viva & Record    |  |  |  |  |           |

Chairperson

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HINDI MAHAVIDYALAYA, NALLAKUNTA, HYDERABAD  
(AUTONOMOUS)

B.Sc II year Semester – III & IV

SEC Theory Model Question Paper

Max.Marks:35

Time: 1 1/2 hrs

SECTION A

I Write short notes on any three of the following:

3 X 5 = 15 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

SECTION B

II Answer two of the following Questions. 2 X 10 = 20 Marks

5. (a) A question from Unit I

(OR)

- (b) A question from Unit I

6. (a) A question from Unit II

(OR)

- (b) A question from Unit II

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3	Ms. A. Ch. Pradyutha Department of Microbiology RBVRR Women's College, Narayanaguda, Hyderabad.	9705335025
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5	Ms. Ramakalyani Department of Microbiology HRD Degree College, Narayanaguda, Hyderabad.	9059528429
6	Mrs. Marthapaul, Department of Microbiology, Shadan Degree College, Khairtabad, Hyderabad.	
7	Dr. K. Anuradha Department of Microbiology, Bharatiya Vidya Bhavans Vivekananda College of Science, Humanities, Commerce, Sainikpuri, Hyderabad	9849977396
8	Dr. S. P. Sreedhar Bhattar, Department of Microbiology, Bharatiya Vidya Bhavans Vivekananda College of Science, Humanities, Commerce, Sainikpuri, Hyderabad	9963736496

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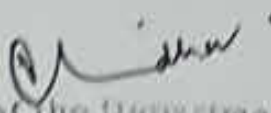
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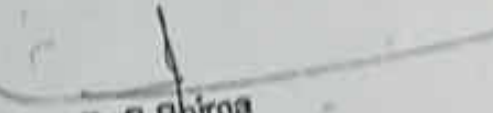
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