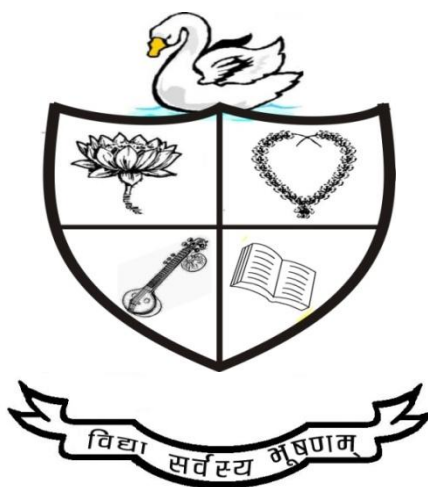


SYLLABUS FOR THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP)

As per provisions of NEP_2020 to be implemented from
academic year 2022 onwards.

Semester: II	Session: 2026-27
Course Type: DSC	Title: Microbiology and Molecular Biology



Department of Biotechnology
**GOVT. DIGVIJAY AUTONOMOUS POST GRADUATE
COLLEGE, RAJNANDGAON (C.G.)**



GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)

FYUGP (NEP 2020 Course)

Department: Biotechnology

Part A: Introduction			
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree/Honors)		Semester: II Sem	Session: 2026-27
1	Course Code	BTSC-02-T	
2	Course Title	Microbiology and Molecular Biology	
3	Course Type	Core Course	
4	Pre-requisite (if any)	As per program.	
5	Course Learning Outcomes (CLO)	After completing this course, the students will be able to - • Understand various categories of microbes in the living world. • Develop the capability to culture and maintenance of microbes. • Understand the regulatory mechanism for the precursor of life-DNA • Understand the mechanism of genetic expression for the regulation of life.	
6	Credit Value	03 Credits (Credit = 15 Hours - learning & observation)	
7	Total Marks	Max. Marks: 100	Min Passing Marks: 40

Part B: Content of Course (Theory)		
Total No. of Teaching-learning Periods (01 Hr. per period)- 45 Periods (45 Hours)		
Unit	Topic (Course content)	No. of Period
I	Maintenance of microbes 1. Classification of microorganisms and taxonomy. 2. Molecular basis of microbial taxonomy. 3. Growth media for culture of bacterial, viral, and fungal microbes; sterilization. 4. Isolation, purification, and culture methods of microbes (bacteria, virus, and fungi).	12 (12 Hrs)
II	Microbial life 1. Bacterial reproduction- Conjugation, transduction, and transformation. 2. Mycoplasma- Classification, structure, and pathogenesis. 3. Virus- Structure, classification, multiplication, pathogenesis and bacteriophages. 4. Food and water microbes.	11 (11 Hrs)
III	Nuclear maintenance and expression 1. DNA replication. 2. DNA damage and repair. 3. Transcription in prokaryotes and eukaryotes. 4. Processing of RNA- Capping, polyadenylation, and splicing.	11 (11 Hrs)
IV	Genetic expression 1. Genetic code. 2. Translation in prokaryotes and eukaryotes. 3. Operon concept. 4. Recombination.	11 (11 Hrs)
Keywords	Microbial taxonomy, RNA, DNA, operon.	

• Part C - Learning Resource	
Text Books, Reference Books, Other Resources -	
Text Books- ➤ Textbook of Microbiology- A K Kushwaha. ➤ Microbiology – Dr. Preeti Sharma. ➤ Introduction To Medical Microbiology- Ananthnarayana's ➤ Cell and Molecular Biology- P K Gupta	
Reference Book- • Molecular Biology; Watson. • Gene VIII; Benjamin Lewin. • The Cell, A molecular Approach; Geoffrey M. Cooper. • Molecular Biology of the Cell; Alberts • Cell and Molecular Biology; Lodish. • Microbiology – Prescott • Microbiology – Pelczar&Pelczar • General Microbiology I and II – Powar and Dagainawala • Microbiology – Tortora.	
Online resources- https://archive.nptel.ac.in/courses/102/103/102103015/ https://onlinecourses.nptel.ac.in/noc24_bt07/preview	

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks:		100 Marks
Continuous Internal Assessment (CIA):		30 Marks
End Semester Exam (ESE):		70 Marks
Continuous Internal Assessment (CIA) (By course teacher):	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark ; Q2. Short answer type- 5x4 =20 Marks Section B: Descriptive answer type qts., 1out of 2 from each unit- 4x10=40 Marks	

Approval of the Board of Studies						
Date: 20-06-2026						
Name	Prof. S. K. Jadhav	Sabiha Naz	Dr. Shubha Diwan	Shri Sanjay Bhagwat	Ku. Varsha Meshram	Dr. Pramod Kumar Mahish
Designation	VC Nominee	Subject Expert	Subject Expert	Employment/ Industrial Member	Merit Alumni	Chairman/ HOD
Signature	Joined by Google Meet on 20-06-2026 https://meet.google.com/nzg-cntq-zbc					

SYLLABUS FOR THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP)

As per provisions of NEP_2020 to be implemented from
academic year 2022 onwards.

Semester: II	Session: 2026-27
Course Type: DSC: Practical	Title: Microbiology and Molecular Biology



Department of Biotechnology
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GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE, RAJNANDGAON (C.G.)

FYUGP (NEP 2020 Course)

Department: Biotechnology

Four Year Undergraduate Program (2024-28)

Department of Biotechnology

Course Curriculum

Part A: Introduction		
Program: Bachelor in Life Sciences (Certificate/Diploma/Degree/Honors)		Semester: II Sem Session: 2026-27
1	Course Code	BTSC-02-P
2	Course Title	Microbiology and Molecular Biology
3	Course Type	Core Course
4	Pre-requisite (if any)	As per program
5	Course Learning Outcomes (CLO)	After completing this practical course, the students will be able to - • Maintenance of microbes. • Identification of microbes. • Isolation of nucleic acid from microbes. • Elucidations of nucleic acids of microbes.
6	Credit Value	01 Credits Credit = 30 Hours Laboratory or Field learning/Training
7	Total Marks	Max. Marks: 50 Min Passing Marks: 20

Part B: Content of Course		
Total No. of learning-Training/performance Periods: 30 Periods (30 Hours)		
Module	Topic (Course content)	No. of Period
Lab./Field Training/ Experiment Contents of Course	1. Various techniques for sterilization. 2. Preparation of microbial media. 3. Isolation and culture of microbes from air, soil, and water. 4. Determination of Gram-positive and Gram-negative bacteria. 5. Streak plate method for culturing of microbes. 6. Pour plate method for culturing of microbes. 7. Spread plate method for culturing of microbes. 8. Broth culture method for culturing of microbes. 9. Determination of bacterial growth curve. 10. Isolation of DNA from bacteria. 11. Estimation of DNA. 12. Estimation of RNA. 13. Elucidation of DNA bands by electrophoresis.	30
Keywords	Microbes, sterilization, RNA, DNA.	

• Part C - Learning Resource

Text Books, Reference Books, Other Resources -

Text Books-

- Textbook of Microbiology- A K Kushwaha.
- Microbiology – Dr. Preeti Sharma.
- Introduction To Medical Microbiology- Ananthnarayana's
- Cell and Molecular Biology- P K Gupta

Reference Book-

- Molecular Biology; Watson.
- Gene VIII; Benjamin Lewin.
- The Cell, A molecular Approach; Geoffrey M. Cooper.
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- Microbiology – Prescott
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- General Microbiology I and II – Powar and Dagainawala
- Microbiology – Tortora.

Online resources- <https://archive.nptel.ac.in/courses/102/103/102103015/>
https://onlinecourses.nptel.ac.in/noc24_bt07/preview

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Assessment (CIA) (By course teacher):	Internal Test / Quiz-(2):	10 +10	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 15 Marks
	Assignment / Seminar + Attendance- Total Marks -	05 15	
End Semester Exam (ESE):	Laboratory / Field Skill Performance: A. On spot Assessment - 20 Marks B. Spotting based on tools & technology (written) – 10 Marks C. Viva-voce (based on principle/technology) - 05 Marks		Managed by course teacher as per lab status

Approval of the Board of Studies

Date: 20-06-2026

Name	Prof. S. K. Jadhav	Sabiha Naz	Dr. Shubha Diwan	Shri Sanjay Bhagwat	Ku. Varsha Meshram	Dr. Pramod Kumar Mahish
Designation	VC Nominee	Subject Expert	Subject Expert	Employment/ Industrial Member	Merit Alumni	Chairman/ HOD
Signature	Joined by Google Meet on 20-06-2026 https://meet.google.com/nzg-cntq-zbc					