SYLLABUS FOR

THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP)

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

Semester: **VI**	Session: **2025-26**
Course Type: **DSC**	Title: **Immunology**

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

Session: **2025-26**	Program: **B.Sc.**
Semester: **VI**	Subject: **Biotechnology**
Course Type: **DSC**	Course Code: **.....**
Course Title: **Immunology**	
Credit: **4 (3+1)**	Lecture: **60**
M.M. 100 = **(ESE 80+IA 20)**	Minimum Passing Marks: **40%**

Title	**Calculus**
Course Learning Outcome:	After the present course student will be able to - (i) aware about the details of the defence system of our body and its impact on our health. (ii) gain understanding of cells of immune system (iii) read and analyse about the MHC (iv) understand the concept of Vaccine

Title	**Calculus**
Programme Specific Outcome:	Upon completion of this course student will be able to – (i) demonstrate the knowledge of immunology and advanced laboratory practices in the same area. (ii) understand the autoimmune disease (iii) explain immunological techniques

Approval of the Board of Studies

Date: 14/05/25

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 online	Joined online		

Theory

Units	Lectures	Lectures	Credit
I	**15**	Immune Response - An overview, components of mammalian immune system. Concept of Immunity: Innate and Acquired, Humoral and Cell mediated Response.	1
II	**10**	Cells and Organs involved in Immune system - Structure and Function. Molecular structure of Immuno-globulins or Antibodies. Antigen – properties.	2
III	**10**	Major Histocompatibility complexes – class I & class II MHC antigens. Immunity to infection – immunity to different organisms – bacteria and viruses. Autoimmune diseases, Immunodeficiency-AIDS.	
IV	**10**	Vaccines & Vaccination – adjuvants, cytokines, DNA vaccines, recombinant vaccines. Blood group and RH factor. Introduction to immunodiagnostics – RIA, ELISA.	

Practical Course
Credit = 01; Lecture/Lab hour = 15

- Enumeration of WBC in blood sample.
- Preparation of a blood smear and differential blood count.
- To separate serum from the given blood sample.
- To determine Albumin Globulin ratio in given serum sample.
- Estimation of serum protein by Folin Lowry test.
- Detection of class specific Antibody by Double Diffusion method.
- Study of Agglutination reaction
- Study of ELISA technique.
- Immuno-diffusion test.
- Blood group determination by slide agglutination reaction.

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Signature			joined online	joined online		

List of Books	• Kuby, Janis, Jenni Punt, Sharon A. Stranford, Patricia P. Jones, and Judith A. Owen. Immunology. 2019. • Abbas, Abul K., Andrew H. Lichtman, and Shiv Pillai. Basic Immunology: Functions and Disorders of the Immune System. 2020. • Playfair, J. H. L., and B. M. Chain. Immunology. Oxford: Blackwell, 2005.

Evaluation Scheme		
Exam Type	Mode of Exam	Marks
Theory	External	80
	Internal	20
Practical	External	40
	Internal	10

Evaluation Scheme for Theory (External)					
Type of Question	No. of questions	Marks	Word Limit	Choice	Total Marks
Very Short Answer	08	02	30	No	16
Short Answer	04	06	75	Yes	24
Long Answer	04	10	150	Yes	40
Evaluation Scheme for Theory (Internal)					
Based on Mid-term Exam					20
Total					**100**

Evaluation Scheme for Practical			
S. No.	**Evaluation**	**Type**	**Marks**
1	Experiment 1	External	10
2	Experiment 2	External	10
3	Experiment 3/ Instrumentation	External	05
4	Spotting	External	10
5	Viva	External	05
6	Sessional	Internal	10
Total			**50**

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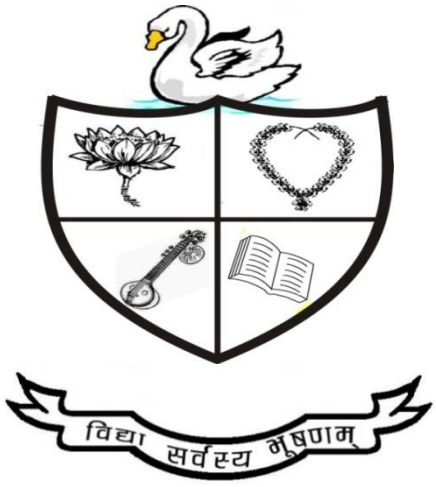
SYLLABUS FOR

THE FOUR-YEAR UNDERGRADUATE PROGRAMME (FYUGP)

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

Semester: **VI**	Session: **2025-26**
Course Type: **DSE I**	Title: **Animal Biotechnology**



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

Session: **2025-26**	Program: **B.Sc.**
Semester: **VI**	Subject: **Animal Biotechnology**
Course Type: **DSE - I**	Course Code: **.....**
Course Title: **Animal Biotechnology**	
Credit: **4 (3+1)**	Lecture: **60**
M.M. 100 = **(ESE 80+IA 20)**	Minimum Passing Marks: **40%**

Title	**Calculus**
Course Learning Outcome:	After the present course students will be able to - • about culture of various cell types • understand Explain the basics of Animal tissue culture, the concept of the technique and its uses in different areas. • gain an understanding of ATC methods • read and analyse the significance of ATC

Title	**Calculus**
Programme Specific Outcome:	Upon completion of this course students will be able to – • Will gain proficiency in laboratory techniques such as sterilisation, Maintenance of ATC lab. • describe the sterilization and propagation • understand the concept of animal cell and tissue culture • Maintenance of ATC lab

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Theory

Units	Lectures	Lectures	Credit
I	**15**	Basics of animal cell culture, Basics principle of cell culture techniques, Application of cell culture, Scope of cell culture.	1
II	**10**	Basic Lab techniques for cell culture, Types of the cell culture, Maintenance of culture, Method of Subculture.	2
III	**10**	Method of Primary cell culture establishment, Mammalian Culture medium and its functions, Different Serum and Antibiotics used in mammalian cell culture.	
IV	**10**	Animal Cell culture Passage Techniques, Isolation of PBMCs from Blood, Monolayer Cell culture, and An introduction of Organoids cell culture.	

Practical Course
Credit = 01; Lecture/Lab hour = 15

- Collection of fresh Blood sample from host.
- Extraction of PBMCs from fresh human Blood.
- Separation of Blood different contents from freshly collected blood sample.
- Microscopic study of Blood cells.
- To perform the total no. count of WBCs cell from fresh blood sample.

List of Books	• U. Satyanarayana (2005) Biotechnology, Books and Allied (P) Ltd., Kolkata. • B.D. Singh, (2004) Biotechnology, Expanding Horizons, 1st Edition, Kalyani Publisher, Ludhiana • Animal cell Biotechnology, Methods & protocols, Nigel Jenkins. Humana Press. Totowa, New Jersey • Animal cell Techniques, M Clynes. • Animal cell Biotechnology Ralf Portner, Humana Press 2007 • Animal cell culture, Practical Approach: RW Master; Oxford university Press 2000

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Evaluation Scheme for Theory (External)					
Type of Question	No. of questions	Marks	Word Limit	Choice	Total Marks
Very Short Answer	08	02	30	No	16
Short Answer	04	06	75	Yes	24
Long Answer	04	10	150	Yes	40
Evaluation Scheme for Theory (Internal)					
Based on Mid-term Exam					20
Total					**100**

Evaluation Scheme for Practical			
S. No.	**Evaluation**	**Type**	**Marks**
1	Experiment 1	External	10
2	Experiment 2	External	10
3	Experiment 3/ Instrumentation	External	05
4	Spotting	External	10
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Total			**50**

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

FYUGP (NEP 2020 Course)

Department: Biotechnology

Session: **2025-26**	Program: **B.Sc.**
Semester: **VI**	Subject: **Bioinformatics**
Course Type: **DSE - II**	Course Code: **.....**
Course Title: **Bioinformatics**	
Credit: **4 (3+1)**	Lecture: **60**
M.M. 100 = **(ESE 80+IA 20)**	Minimum Passing Marks: **40%**

Title	**Calculus**
Course Learning Outcome:	After the present course student will be able to - 1. Explain about the basics of Bioinformatics, concept of the computational tools and uses in the different area. 2. Gain understanding of computational analysis methods

Title	**Calculus**
Programme Specific Outcome:	Upon completion of this course students will be able to – 1. Will gain proficiency in computational techniques such as data extraction 2. Describe the different software and tools 3. Understand the concept of 3D modeling of Biological molecules

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Designation	VC Nominee	Subject Expert	Subject Expert	Employment/ Industrial Member	Merit Alumni	Chairman/ HOD
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Theory

Units	Lectures	Lectures	Credit
I	**15**	An introduction of Bioinformatics, History, Gene Bank, Application of Bioinformatics, Scope of Bioinformatics	1
II	**10**	Different branches of Bioinformatics, Search tools of Biological Database, Expasy, EMBL, Basics of Molecular Docking	2
III	**10**	Introduction of Omics, An Introduction of Drug & cheminformatics sources, Bio-programming software-Perl, pyMOL, EMBOSS, RasMol.	
IV	**10**	Structural Bioinformatics- Nucleic acid data Bank, molecular modelling data bank, An introduction of biological database Chemical database designing.	

Practical Course
Credit = 01; Lecture/Lab hour = 15

1. To extract proteins database from database site.
2. To extract Nucleic acid database from database site.
3. Study of future scope of BLAST search in Biotechnology.
4. To study the protein structure using protein data Bank (PDB)
5. 3D molecular modeling study of protein.

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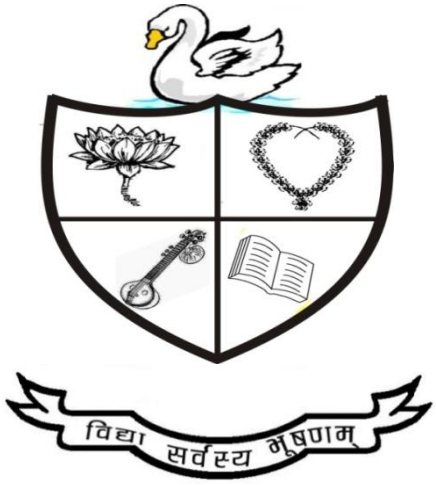

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FYUGP (CBCS/LOCF Course)

Department: Biotechnology

Session: **2025-26**	Program: **B.Sc.**
Semester: **VI**	Subject: **Biotechnology**
Course Type: **SEC**	Course Code: **.....**
Course Title: **30 Hr Industrial Internship**	
Credit: 2	Lecture: 3**0**
M.M. 50 = **(ESE 40+IA 10)**	Minimum Passing Marks: **40%**

Title	**Calculus**
Course Learning Outcome:	After the present course student will be able to - • Skill industrial process • Manage small industries • Understand production, and selling strategies • Start entrepreneur

Detail :

Student has to attend a 30Hr industrial internship in the following listed type industries/enterprises –

Food and Beverages; Fisheries; Bakery; Blood Banks; Diagnostic labs; Hospitals; Krishi Vigyan Kendra (KVK); Botanical Garden; Nursery; Organic farms; SHGs; Sugar Factory; Maize Industries; Dairy; Oil and Surfactants; Distilleries; Museum etc.

Evaluation Scheme

Evaluation	Marks	Pattern
Project Report	30	Internal
Viva based on project report	10	Internal and Inter-departmental
Internal	10	Internal

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