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

DEPARTMENT OF ZOOLOGY

B.Sc. Zoology Honours with Research
VIII Semester Syllabus
(FYUGP/LOCF)

(Syllabus Based on UGC-LOCF Curriculum)

(2025 – 2026)

(Approved by Board of Studies)
Effective from July 2025-26
As Per provisions of NEP 2020 to be implemented from academic year 2022-23

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

Department of Zoology
Syllabus of FYUGP/LOCF Curriculum
B.Sc. Honours with Research Course
VIII Semester Syllabus
Session: 2025-26

Sem	Course	Course Name	Credit	Lecture	Internal Marks	ESE Max Marks	M.M.
VIII	DSC –VIII	Biotechniques	3	45	20	80	100
		Lab Course	1	15	-	-	50
	DSE- X	Basics of Computer and Biostatistics	3	45	20	80	100
		Lab Course	1	15	-	-	50
	DSE- XIII	Dissertation/Thesis Writing	12		-	-	200
Total			20	300	100	480	500

GOVT. DIGVIJAY AUTONOMOUS PG COLLEGE RAJNANDGAON (C.G.)

FYUGP (CBCS and LOCF Pattern)

Department of Zoology
B.Sc. Honours with Research
2025-26

Session: 2025-26	**Program: B.Sc.**
Semester: VIII	**Subject: Zoology**
Course type: DSC- VIII	**Course Code:**
Course Title : Biotechnique	
Credit: 04 (03+01)	**Lecture – 60 (45+15)**
MM: 100 = (ESE 80+IA 20)	**Minimum Passing Marks: 40%**

Title	**Biotechniques**
Course Learning Outcome:	Students will understand various microscopy techniques, microtomy processes, and tissue slide preparation. They will learn physiological tools like pH meters and spectrophotometry, chromatography and electrophoresis principles, and cell culture methods. Additionally, students will gain knowledge of sterilization techniques and lab bioethics for safe and ethical laboratory practice.
Program Specific Outcome:	Students will gain comprehensive knowledge of microscopy types, microtomy techniques, and tissue preparation. They will learn physiological tools like spectrophotometry and centrifugation, along with chromatography and electrophoresis principles. Skills in cell culture, sterilization, and lab bioethics prepare them for safe, ethical, and effective laboratory practices.

Unit	Lectures	Topics	Credits
I	10	**Microscopy and Microtomy:** **1. Types of Microscope:** Basic Principle, configuration and working of Light Microscope (Bright and Dark Field), Magnification & Resolution, and Numerical Aperture,Phase Contrast Microscope, Fluorescence Microscope,Conifocal Microscope Electron Microscope (SEM and TEM). **2. Microtomy** : Permanent slide preparation Through microtome :Tissue-preparation fixation, dehydration, **block** –preparation, trimming, **Cutting sections (sectioning / Ribbon)** - handling, affixing on the side, labeling and storage , **staining** the microtomy slides.	0.75
II	10	**Tools and techniques in Physiology:** Principle and applications of pH meter, Centrifugation, Colorimetry and Spectrophotometry -UV, visible spectrophotometer, Infra-red spectrophotometer, NMR and ESR.	0.75
III	10	**Chromatography and Electrophoresis:** **1. Chromatography:** Principle and Applications of Paper chromatography, Thin layer chromatography and Gel-filtration chromatography. 2. **Electrophoresis:** Principle and Applications of Agarose gel electrophoresis, Polyacrylamide, Gel electrophoresis , PAGE,2D PAGE.	0.75
IV	15	**Cell culture and Lab Bioethics:** **1.** Cell culture and its basic requirements. **2. Culture media:** Nutrient and Non-nutrient media, Types of animal cell culture : Pure Culture - Pour Plate Method, Streak Plate Method and Spread Plate Method. **3. Media preparation** of Animal Cell culture, viability testing, cell harvesting and storage method with special reference to Lymphocytes and stem cell culture. **4.** *In Vitro* cultureof Entamoeba *histolytica, Coenorhabditis elegans*	0.75

		5. **Sterilization technique** (Physical Method: Autoclave sterilization , Hot air Sterlization, U V sterilization, filtration and chemical Method: alcohol, Formalin and Chromic acid), sterilization of glass wares, Media and laminar flow, Flow cytometery. 6. **Lab Bioethics:** Lab safety, disposal of bio –waste.	
Lab course	15	**1.** Study and handling of Compound Microscope, pH meter, Colorimeter, Centrifuge, **2.** Spectrophotometer, Chromatography Chamber, ElectrophorosisUnit, Microtome. **3.** Sterilization of Lab equipments. **4.** Determination of pH of different soil samples & water samples. **5.** Determination of maximum absorption. **6.** Separation of Amino acids, plant pigment and sugar by paper and thin layer **7.** chromatography **8.** Separation of DNA and RNA through Paper & Gel Electrophoresis **9.** Separation of particles by Centrifuge. Preparation of Permanent slides through Microtome. **10.** Preparation of Temporary and Permanente slides of some microscopic organisms. **11.** Pure culture of cell. **12.** Cell fractionation **13.** Contour drawing through Camera Lusida Preparation of Practical Record. **14.** Group discussion/Viva or Seminar presentation on above mentioned topics.	1
Recommended Books		• Pearse, A.G.E. (1980-1993) Histochemistr-Theoretical and applied, Volume I -III, Churchill - Livingstones. • Plummer, D. (2017) An Introduction to Practical Biochemistry (3 rd edition) McGraw Hill. • Wilson, K. and Walker, J. (2010) Experimental Biochemistry, Cambridge. Practical. • Swarup N, Arora S and Pathak SC, Laboratory Techniques in Modern Biology. Kalyani Publishers. • SharmaB.K,Principles of Instrumentation Goel Publishing House • Upadhayay Upadhayay & Nath, Principles of Instrumentation , Himalaya Publishing House. • Chatwal G R&Anand Sharma , Principles of Instrumental method of Chemical Analysis, HimalayaPublishing House. • Arumugam N, Kumaresan V, Biotechniques Saras Publication. • Ghatak K L, Techniques and Methods in Biology PHI Learning	

Evaluation Scheme

Evaluation Scheme	Sections in Question Paper	Question type	Word Limit	No. of Questions	Marks per Question	Total
External	A	Very Short answer type	50	8	2	16
	B	Short answer type	100	4	6	24
	C	Long answer type	200	4	10	40
Internal	**Based on CT & Assignment/Project**					20
Total =						100

Evaluation Scheme of Practical

Practical	Experiment 01	12
	Experiment 02	08
	Experiment 03	04
	Spotting	16
	Viva	05
	Sessional	05
Total -		**50**

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GOVT. DIGVIJAY AUTONOMOUS PG COLLEGE RAJNANDGAON (C.G.)

FYUGP (CBCS and LOCF Pattern)

Department of Zoology

B.Sc. Honours with Research

2025-26

Session: 2025-26	**Program: B.Sc.**
Semester: VIII	**Subject: Zoology**
Course type: DSE- X	**Course Code:**
Course Title : Basics of Computer and Biostatistics	
Credit: 04 (03+01)	**Lecture – 60 (45+15)**
MM: 100 = (ESE 80+IA 20)	**Minimum Passing Marks: 40%**

Title	**Basics of Computer and Biostatistics**
Course Learning Outcome:	Students will understand computer fundamentals, including hardware, software, number systems, and MS Office applications. They will learn data collection, classification, and presentation techniques using tables and graphs. Students will grasp statistical concepts such as central tendency, dispersion, correlation, regression, probability distributions, and significance tests like t-tests and ANOVA.
Program Specific Outcome:	This syllabus equips students with foundational knowledge of computer systems, software applications, and digital concepts, enabling effective data management and analysis. It develops skills in statistical methods, hypothesis testing, and interpretation of data, preparing learners for research, data-driven decision-making, and problem-solving in various scientific and professional fields.

Unit	Lectures	Topics	Credits
I	10	**Unit -I: Computer structure and Applications:** History of Computers, Structure of Computers, Classification of Computers, Introduction to digital computer - basic knowledge of hardware & software**,** CPU, Input and Output devices, Computer Codes : Decimal System, Binary number system, hexadecimal system, octal system, Conversion of numbers. Introduction to MS Office-MS Word, MS Excel, MS Power point, Introduction of Internet, web-mail, various search engine, Plagiarism, Artificial Intelligence (AI).	0.75
II	10	**Unit-II: Data collection, presentation, and Measures of central tendency:** Collection and classification of data. Presentation of data: by Tables -rules for making tables, use of tables, Types of tables, By Graphs : rules for making graph & it's uses, Pie chart, Bar diagram, Histogram, Frequency polygon, Cumulative frequency curve (Ogive and Polygon). Measures of central tendency: Arithmetic Mean, Median, Mode.	0.75
III	10	**Dispersion Correlation and Regression:** Measures of dispersion: Standard deviation and Standard error. Correlation: Types, significance and application of correlation, calculation of correlation in continuous data and ordinal data. Regression: Linear regression, regression coefficient.	0.75
IV	15	**Probability and Analysis of Significant Test:** Probability: normal, binomial Distribution and Poisson distributions. Hypothesis testing, Test of significance: Paired and unpaired t-test and Chi square test. Analysis of Variance (one & two way ANOVA).	0.75
Lab course	15	**1.** Exercise based on Microsoft word. **2.** Study of hardware & software.	

		3. PPT Slide preparation using Microsoft Power Point. **4.** Data collection. **5.** Analyzing Data manually and through computer :Mean, Median, Mode, SD, SE ,Correlation and regression and its interpretation. **6.** Tabular &Graphical presentation of data manually and using excel **7.** Hypothsis testing by *t*-test, Chi -square test and ANOVA **8.** Group discussion/Quiz/Seminar presentation on related topics. **9.** Practical Recordor Lab assignment.	1
Recommended Books	***Text Books Recommended –*** • Balagurusamy, E. (2011) Fundamentals of Computers, McGraw Hill Education, Rajaraman, V.: Fundamentals of Computers, 5th edition, PHI Learning Pvt. Ltd., 2010 • Sinha, P., Sinha, P.K.(2004),Computer Fundamentals: Concepts, Systems and Applications, 8th edition, BPB Publications . • Khanal, A.B. (2015),Mahajan's Methods in Biostatistics, The Health Sciences Publishers. ***Reference Books Recommended –*** • Daniel, W.W. (2012)Biostatistics: A Foundation for Analysis in Health Sciences (10th edition) John Wiley. • Milton, J.S.& Tsokos,J.O. (1992) Statistical Methods in the Biological and Health Sciences 2nd edition) McGraw Hill. • Zar, JH , (2010), Biostatistical Analysis, Prentice -Hall/Pearson, 2010.	

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Practical	Experiment 01	12
	Experiment 02	08
	Experiment 03	04
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Total -		**50**

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GOVT. DIGVIJAY AUTONOMOUS PG COLLEGE RAJNANDGAON (C.G.)

FYUGP (CBCS and LOCF Pattern)

Department of Zoology

B.Sc. Honours with Research

2025-26

Session: 2025-26	**Program: B.Sc. Honours with Research**
Semester: VIII	**Subject: Zoology**
Course type: DSE- XI	**Course Code:**
Course Title : Dissertation	
Credit: 12	
Maximum Marks: 200	

Title	**Dissertation**
Course Learning Outcome:	Students will develop skills in identifying research problems, designing experiments, data collection, analysis, and interpretation. They will enhance scientific writing, critical thinking, and presentation abilities. This project fosters independent research, problem-solving, and application of theoretical knowledge to practical scientific investigations in their chosen field.
Program Specific Outcome:	The Dissertation (Minor Project) cultivates research proficiency, analytical skills, and scientific inquiry. It strengthens problem-solving, data interpretation, and academic writing abilities. Students gain experience in experimental design, critical evaluation, and ethical research practices, preparing them for advanced studies or professional roles requiring independent investigation and effective communication.

Dissertation Specification & Marks Distribution			
S. No.	**Topics**	**Specification**	**Marks**
1.	**Front page**	• Formation Including: Declaration, Certificate, Acknowledgement and Database Table for Contents, Graphs, and Data.	10
2.	**Introduction**	• Introduction to the Study • Explanation of the Background of the Problem • Presentation of the Purpose of the Study • Review Research Questions • Relate to Assumptions and Limitation Of Study • Definition of Operative Terms- May Referee To "Glossary ' In Appendix	10
3.	**Review of Literature**	• Introduction • Organized by Themes Or Chronological of The Literature • Analysis of Previous Findings. • Discussion of the Current Study Within the Field	10
4	**Methodology**	• Introduction of the Methods Chosen For The Study • Explanation of the Research Design • Presentation of Research Questions • Description of Setting & Participants • Discussion of Data Collection and Analysis • Conclusion	10
5.	**Database**	• Data Collection • Data Presentation • Data Analysis Through Tables & Graphs • Statical Analysis	10
6.	**Discussion & Result**	• Introduction About Result • Discussion of the Findings, Perhaps Organized By Research	10

		Questions. • Balanced Presentation Of Your Data & Analysis	
7.	**Bibliography**	• APA Complaint • Refer To In Text Citations • Accurate Dois, Both Long Or Shortened • Urls, Both Long And Shortened	10
8.	**Summary /Overall thesis Design and final research submission**	• Has Professional Appearance & Follows Hemchand Yadav University Durg Guideline. • Including All Front Matter and Pagination. • Table of Contents • Use of Heading to Ease Readability • References • Appendix	35
9.	**Expected Outcome**	• Expected outcome is the necessary part of research discusses how any research any research work is use for society.	25

Marking for Presentation & Viva

1.	**Presentation**	• Presentation of Thesis through PPT In Front Of External, Internal Examiners and Departmental Faculties and Students.	35
2.	**Viva-voice**	• Questions And Answers Related To The Thesis Will Be Asked At The End By External And Internal Examiners As Well As Departmental Faculties And Students.	35

Evaluation Scheme of Dissertation

Project Report	70
Summary	35
Expected Outcome	25
Presentation	35
Viva	35
Total -	**200**

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