



# बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsā Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

## School of Science B.Sc. (Zoology) Programme

**Subject Code & Name: BS04MJZOO2 Cell Biology and Genetics II**

### Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage (%)			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
3	-	1	4	35	15	35	15

<b>Programme Name</b>	B.Sc. Zoology
<b>Semester</b>	IV
<b>Course Code</b>	BS04MJZOO2
<b>Course Title</b>	Cell Biology and Genetics II
<b>Course Content Type (Th./Pr.)</b>	Theory + Practical
<b>Course Credit</b>	4
<b>Sessions + Lab. Per Week</b>	3 + 2
<b>Total Teaching/Lab. Hours</b>	45 Theory Hours + 30 Practical Hours
* 2 Laboratory = 1 Session	

### Learning Objectives

1. To study about cytoskeleton, cell growth, and cell division.
2. To understand non-allelic gene interactions.
3. To learn about hereditary diseases by studying human genetics.
4. To learn advanced cell biology through experiments and learn to solve genetics problems and pedigree analysis.

### Prerequisites (if any)

- Good understanding of basic biological concepts, including cell structure, function and basic genetics, is of paramount importance.

### Learning Outcomes

On the Completion of this course, students will able to:

1. Students will understand the skeleton which utmost important for the cell integrity and cell division.
2. Students will be able to describe the types and stages of mitosis and meiosis.
3. Understand non-allelic gene interactions and its chemical basis.
4. Students will understand the Human genetics.







# बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsā Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

## School of Science B.Sc. (Zoology) Programme

Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	<b>Cell Cytoskeleton, Cell Growth and Cell division:</b> <ul style="list-style-type: none"><li>• Microtubules, Microfilaments and Intermediate Filaments.</li><li>• Cilia and Flagella</li></ul> <b>Cycle and Cell Division</b> <ul style="list-style-type: none"><li>• Phases of the cell cycle (Interphase: G<sub>1</sub>, S, G<sub>2</sub>; M Phase: Mitosis), Regulation of the cell cycle</li><li>• Mitosis: Stages of mitosis (Prophase, Metaphase, Anaphase, Telophase), Mechanisms of mitotic division.</li><li>• Meiosis: Comparison with mitosis, Stages of meiosis (Meiosis I and Meiosis II).</li></ul>	15
II	<b>Non-Allelic Interaction:</b> Definition and Types. <ul style="list-style-type: none"><li>• Complementary gene interaction in Sweet Pea (9:7).</li><li>• Supplementary gene interaction in Domestic fowls (9:3:3:1).</li><li>• Duplicate gene interaction in Shepherd's purse plant (15:1).</li><li>• Dominant Epistasis in Domestic dogs and <i>Cucurbita pepo</i> (12:3:1).</li><li>• Recessive epistasis in Mice and Tobacco (9:3:4).</li></ul>	15
III	<b>Human Genetics:</b> <ul style="list-style-type: none"><li>• Sex Linked Inheritance: Definition and Types.</li><li>• X-linked inheritance: Eye color in <i>Drosophila</i>, Colorblindness and Hemophilia in Man.</li><li>• Pedigree Analysis of Colorblindness and Hemophilia</li><li>• Y-linked Inheritance.</li><li>• Sex influenced characters: Baldness in Man.</li><li>• Sex Limited Gene and its Examples.</li></ul>	15







Established by Tribal Development Department, Govt. of Gujarat

**School of Science**  
**B.Sc. (Zoology) Programme**

Text Book(s)	
1.	Cell and Molecular Biology by P.K. Gupta
2.	Cell Biology by C.B. Powar.
3.	Textbook of Cell Biology by S. C. Rastogi
4.	Cell Biology and Genetics by P.S. Verma & V.K. Agarwal, S. Chand Publishing
5.	Cell Biology by B. M. S. Chandra
6.	Cell Biology, Genetics, Molecular Biology, Evolution and Ecology by S. P. Verma & V.K. Agarwal
7.	Cell Biology, Biochemistry, Genetics and Molecular Biology by R. K. Gupta
8.	Fundamentals of Cell Biology by N. K. Verma
9.	A Textbook of Cell and Molecular Biology by R. C. Dubey
10.	Cell Biology and Molecular Biology by N. Arumugam, Saras Publication.

1. Molecular Cell Biology by Lodish (Indian Edition)
2. Molecular Biology of the Cell by Alberts et al.
3. Cell and Molecular Biology by Gerald Karp
4. Essential Cell Biology by Alberts, Johnson, Lewis, Raff, Roberts, and Walter
5. The Cell: A Molecular Approach by Geoffrey M. Cooper
6. Lehninger Principles of Biochemistry by David L. Nelson and Michael M. Cox
7. Cell Biology by Thomas D. Pollard and William C. Earnshaw
8. કોષવિજ્ઞાન – પ્રા. વિનોદકાંત યૂનીલલ શાહ અને ડૉ. અરવિંદભાઈ ભોગીલાલ વ્યાસ, યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ, ગુજરાત રાજ્ય
9. નિરવ કોલેજ પ્રાણીશાસ્ત્ર, ૧૦૩, યુનિટ ૩ કોષવિદ્યા/કોષ જીવવિજ્ઞાન, નિરવ પ્રકાશન
10. નિરવ કોલેજ પ્રાણીશાસ્ત્ર, ૧૦૩, યુનિટ ૪ જનીનવિદ્યા, નિરવ પ્રકાશન
11. નિરવ કોલેજ પ્રાણીશાસ્ત્ર, ૨૦૧, યુનિટ ૪A જનીનવિદ્યા, નિરવ પ્રકાશન





# बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsā Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

## School of Science B.Sc. (Zoology) Programme

### Web Resources

**L::** Lecture, **T::** Tutorial , **P::** Practical

**CCE::** Continuous and Comprehensive Evaluation

(CCE Theory includes Mid Semester Examination, Assignment, MCQ quizzes, Seminar, Reflective notes, class participation, case analysis and presentation, slip tests (announced/ surprised), attendance etc. or any combination of these)

**PWE::** Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)

**SEE::** Semester End Evaluation

