



Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: ysmranchi4@gmail.com

(NAAC Accredited, Grade: B++, CGPA: 2.89)

Course plan

NAME OF THE DEPARTMENT: Zoology

NAME OF THE FACULTY: Dr. Indumati Thakur

Dr. Anjana Verma

Dr. Rakhee Lohia

ACADEMIC SESSION: August 2022

YEAR: 2022

PROGRAM: B. Sc.

SEMESTER: V

COURSE TYPE: Core

COURSE: GENETICS

COURSE CODE: CC-12

TOTAL CREDIT: 6 = (4 Theory, 02 Practical)

Program Outcomes (POs):

Student should be able to,

PO1- Apply the knowledge and concepts of biology and its fundamental principles and to identify, analyze and find solutions to various biological problems.

PO2- Identify, hypothesize, and review available research literature, and analyze complex biological issues reaching substantiated conclusions using knowledge of biodiversity, environment, and biological functioning.

PO3- Develop scientific temperament, an ability to merge, interconnect and extrapolate information and knowledge across various streams.

PO4- Ability to decide appropriate technology and tools to solve problems. Understand the availability, of resources, their judicious use, and the execution of the project in sustainable way.

PO5- Design solutions for complex scientific problems and design processes that meet the specified needs with appropriate consideration for public health & safety, cultural, societal, legal, constitutional and environmental considerations.

PO6- Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO7- Communicate effectively on complex scientific activities with the science community and with society at large, such as, being able to comprehend and write effective reports and design documents, make effective presentations, and give and receive clear instructions.



Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: ysmranchi4@gmail.com

(NAAC Accredited, Grade: B++, CGPA: 2.89)

PO8- Demonstrate knowledge and understanding of the scientific principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO9- Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of scientific developments, technological advancements and global changes.

PO10- Value and foster Physical, Physiological and Psychological well-being through personal practice and conduct. Ability to apply the learnings for a lifelong commitment to ethics in fulfilment of professional and social obligations.

PO11- Apply academic learning to promote higher studies, sustainable living through employment, and initiation of entrepreneurial advent to create opportunities and wealth for self and society.

PO12- Value and support social causes and rural development through service and philanthropic activities.

PROGRAM-SPECIFIC OUTCOMES (PSOs):

Student should be able to,

PSO1: An ability to demonstrate in-depth knowledge and understanding of the fundamental concepts, principles, and processes underlying the academic field of Zoology and its different subfields like animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology, endocrinology, biochemistry, genetics, and evolutionary biology, animal biotechnology, applied Zoology, aquatic biology, immunology, reproductive biology, parasitology, entomology, apiculture, aquarium fish keeping, medical diagnostics, and sericulture.

PSO2: Development of procedural knowledge and merging it with the advanced techniques available to create different types of professionals in the field of Zoology and related fields such as Apiculture, Fisheries, Medical Diagnostics, Sericulture, Paleozoology, Ornithology, Herpetology, Forensics, Bioinformatics, and Arachnology.

PSO3: Understand and appreciate the complexity of life processes, their molecular, cellular, and physiological processes, their genetics, evolution, and behavior, and their interrelationships with the environment.

COURSE OUTCOMES (COs):

CO1: Understanding the types of cells, different types of cellular organization, and their complexities.

CO2: Aware of cellular compartmentalization, its functions, and its biological significance.

CO3: Understanding of cell division and its role in maintaining a stable genetic constituency, associated disease in cancer.



Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: ysmranchi4@gmail.com

(NAAC Accredited, Grade: B++, CGPA: 2.89)

CO4: Ability to distinguish between different types of cellular cross-talk and their role in structural and functional coordination.

CO5: They develop an appreciation for the biological functions at the cellular level and gets aware of their role in their day-to-day lives.

CO6: Aware of the associated diseases due to impaired physiology and able to design a healthy lifestyle for themselves and their loved ones.

Correlation between POs and COs

POs → COs ↓	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4
CO1	3	2	2	2	-	1	-	-	-	-	3	3	-	-
CO2	3	2	2	2	-	1	-	-	-	3	3	3	-	-
CO3	3	3	3	3	-	2	1	-	2	2	3	3	3	1
CO4	3	2	2	2	-	2	-	2	-	3	1	2	1	-
CO5	-	-	-	-	-	2	-	-	-	3	-	2	2	-
CO6	2	-	-	-	-	-	-	-	3	3	-	2	2	2

1. Weak

2. Moderate

3. Strong

Course teaching and learning activities

A. PEDAGOGY

- i. Whiteboard
- ii. Flipped Class
- iii. PPT
- iv. Debate
- v. Group Discussions

B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES			TEST	QUIZ	ASSIGNMENT
	THEORY	PRACTICAL	TUTORIAL			
1	8	8	-	1	1	-
2	12	12	-	1	1	-
3	10	10	-	1	1	-
4	4	4	-	1	1	-
5	6	6	-	1	1	-
6	3	3	-	1	1	-
7	9	9	-	1	1	-
8	8	8	-	1	1	-



Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: ysmranchi4@gmail.com

(NAAC Accredited, Grade: B++, CGPA: 2.89)

COURSE DELIVERY PLAN:

UNIT	TOPIC/SUBTOPIC	LECTURE REQUIRED	CO ADDRESSED	ASSIGNMENT /TEST/QUIZ
1	Mendelian Genetics and its Extension Principles of inheritance, Incomplete dominance and co-dominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Sex-linked, sex-influenced and sex-limited characters inheritance.	8	CO 1	1
2	Linkage, Crossing Over and Chromosomal Mapping Linkage and crossing over, Cytological basis of crossing over, Molecular mechanisms of crossing over including models of recombination, Recombination frequency as a measure of linkage intensity, Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.	12	CO 1, 2, 4, 5	2
3	Mutations Types of gene mutations (Classification), Types of chromosomal aberrations (Classification, figures and with one suitable example of each), Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method.	10	CO 2, 4, 5, 6	1
4	Sex Determination Chromosomal mechanisms of sex determination in <i>Drosophila</i> and Man	4	CO 5, 6	2
5	Extra-chromosomal Inheritance Criteria for extra-chromosomal inheritance, Antibiotic resistance in <i>Chlamydomonas</i> , Mitochondrial mutations in <i>Saccharomyces</i> , Infective heredity in <i>Paramecium</i> and Maternal effects	6	CO 1, 2, 3	1
6.	Polygenic Inheritance Polygenic inheritance with suitable examples; simple numericals based on it.	3	CO 1, 2, 3	2
7.	Recombination in Bacteria and Viruses Conjugation, Transformation, Transduction, Complementation test in Bacteriophage	9	CO 3,4,5,6	4
8.	Transposable Genetic Elements Transposons in bacteria, Ac-Ds elements in maize and P elements in <i>Drosophila</i> , Transposons in humans	8	CO 4, 5, 6	1



Yogoda Satsanga Mahavidyalaya

JAGANNATHPUR, DHURWA, RANCHI – 834004

Email address: ysmranchi4@gmail.com

(NAAC Accredited, Grade: B++, CGPA: 2.89)

C. SUGGESTED READINGS

a. TEXT BOOKS

b. REFERENCE BOOKS

- i. Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). Principles of Genetics. VIII Edition. Wiley India
- ii. Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics. V Edition. John Wiley and Sons Inc
- iii. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. X Edition. Benjamin Cummings
- iv. Russell, P. J. (2009). Genetics- A Molecular Approach. III Edition. Benjamin Cummings
- v. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. Introduction to Genetic Analysis. IX Edition. W. H. Freeman and Co
- vi. Fletcher H. and Hickey I. (2015). Genetics. IV Edition. GS, Taylor and Francis Group, New York and London.

c. VIDEO RESOURCE

d. WEB RESOURCES:-

e. E-RESOURCES