



Dr. V.S. KRISHNA GOVERNMENT DEGREE & P.G. COLLEGE (A)
(An Autonomous institution Affiliated to Andhra University)
Reaccredited by NAAC with "A" Grade (3rd Cycle)
Nodal Resource Center & Research and Development Cell
Maddilapalem, Visakhapatnam - 530013, Andhra Pradesh



Add-on Course on RESEARCH METHODOLOGY



DEPT OF ZOOLOGY

Dr. V. S. Krishna Govt. Degree & PG College (A)

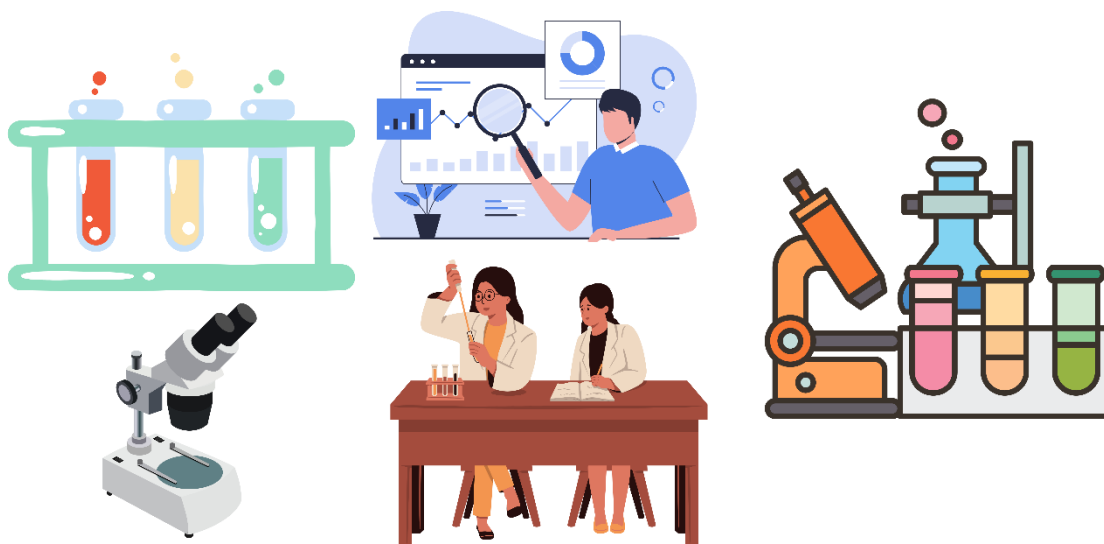
Add-on Course

2022-23

Title: RESEARCH METHODOLOGY



DEPARTMENT OF ZOOLOGY





Dr.V.S.KRISHNA GOVT. DEGREE COLLEGE

(AUTONOMOUS)

NODAL RESOURCE CENTRE & AU CENTRE FOR RESEARCH

Maddilapalem, Visakhapatnam - 530013, Andhra Pradesh.

0891-2553262, <https://www.drsvskrishnagdc.edu.in>



PERMISSION LETTER TO START ADD-ON COURSE

From
The Head of The Department,
Department Of Zoology
Dr. V. S. Krishna Govt. Degree College (A)

To
Principal,
Dr. V. S. Krishna Govt. Degree College (A)

Sir,

Sub: Permission to start an Add-on course for 2022-23 and permission to nominate the Zoology faculty to teach classes for the add on course - regarding

Ref: Resolution copy of the department of Zoology Dated 25-08-2022

As per the resolution of the department of Zoology, we are very much glad to start add-on course entitled “**Research Methodology**” for the B.Sc & M.Sc. students for the academic year 2022-23. In this regard, I request your kind self to accord permission to start the Add on course and also permission to teach theory and practical classes for the said add - on course.

Course Coordinator

Thanking you sir

HOD
Department of Zoology

PRINCIPAL
PRINCIPAL
Dr. V.S. Krishna Govt. Degree College (A)
VISAKHAPATNAM



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DEPARTMENT OF ZOOLOGY

Add-on Course for 2022-23

RESEARCH METHODOLOGY

Introduction:

A research methodology certificate course typically covers the principles and practices of designing, conducting, interpreting, and communicating research studies. The objective of the course is to provide participants with the fundamental skills and knowledge needed to design and execute research projects effectively.

This is a 2 Credits Course with 60 hours of duration. The course will enable the students to develop basic methodology for their project and research studies. The mission of the course is to impart research skills to the beginners and help improve the quality of Research by the existing researchers.

This course is usually offered at the graduate or postgraduate level to improve their expertise in research methods. The course covers basics of research design options, data analysis, statistical analysis, and ethical considerations in research in addition to some of the research techniques that a UG and PG student can employ in order to carry out a project.

The Course Structure is designed in a way that the learning of Research Methodology can move from Mugging up syndrome to fun-practical method; from a teaching process to an experimental process and from competitive learning to collaborative learning.

The Participants of the course will start the course by reading the provided literature at the end of the course they will find themselves equipped enough to author a book or two themselves with the protocols offered to them specifically designed for live practical sessions with plant/animal tissues.

Goals and Objectives:

- to verify and test important facts by employing the statistical tools
- to prepare solutions and reagents
- to design a research topic with the techniques learnt during the course
- to develop new scientific tools, concepts and theories to solve and understand scientific and nonscientific problems
- to find solutions to scientific, nonscientific and social problems and
- to overcome or solve the problems occurring in our every day life.

Course objectives: at the end of the course, the student

- shall be familiar with various statistical tools
- shall be able to maintain cleanliness of various glassware used in research studies
- shall have a hands-on exposure to various scientific instruments
- shall have knowledge on research ethics
- will be able to understand the concept of IPR and patenting



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Department of Zoology Add-on-course (w.e.f. 2022-23)

Course Title: RESEARCH METHODOLOGY

Hours: 60

Max. Marks: 100

AIM OF THE COURSE

To equip students / researchers with research methodology essential for pursuing research degrees and inculcate a spirit of research among UG and PG students

LEARNING OBJECTIVES

- Identify the role and importance of research in life sciences
- To design a research topic
- To develop solutions for identified problems in the field of science
- To give students hands-on experience with scientific instruments available in the college
- To make the students set goal for furthering their studies in research

COURSE OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of feed quality and feed ingredients. This course will provide students with a deep knowledge in aqua culture feeds. By the completion of the course the graduate shall be able to –

- **CO1-** Students who complete this course will be able to understand and comprehend the basics in research methodology
- **CO2-** Students shall be able to applying the methodology in carrying out a research/ project work.
- **CO3-** Get hands-on experience of various instruments.
- **CO4-** Shall be able to read, comprehend, and explain research articles in their academic discipline
- **CO5-** Knowledge on and importance of Ethics, IPR and Patenting involved in research

CO-PO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	✓				✓		✓		✓
CO2	✓		✓			✓	✓	✓	✓
CO3		✓				✓		✓	✓
CO4	✓				✓		✓	✓	
CO5				✓	✓		✓	✓	✓



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SYLLABUS

Unit -1:- Introduction to Research Methodology, Data Collection, Analysis and Testing of Hypothesis

Meaning of Research, Objectives of Research, Criteria of Good Research, Designing of Research, Perform literature reviews using print and online databases, Writing of Research Proposal, Survey, Sampling, Measures of Central Tendency, Correlation, Regression, ANOVA, t-Test and f-Test

Unit -2:- Glassware, Solutions and Buffers

Glassware - Types of glassware used in Research, Autoclaving
Solutions and Reagents – Preparation of Stock Solution, Molar/Normal/Formal Solutions
Buffers – Acids, Bases, Buffers, pH

Unit -3:- Instrumentation

Hands-on training in Microscopy, Electronic Weighing Balance, pH Meter, Colorimeter, Centrifuge, Spectrophotometer, Laminar Air Flow

Unit -4:- Techniques

Electrophoresis – Agarose and SDS-PAGE, Chromatography – Paper and Thin Layer, Tissue Culture technique, Preparation of Culture Media

Unit -5:- Ethics in Research and IPR

Research Ethics - Introduction, Overview, and Research Misconduct, rules and regulations in India; Regulatory Guidelines for Research in Biology - Regulation for research using animals (CPCSEA), stem cells (DBT), microorganisms, GMO (Biosafety), plants (National Biodiversity Authority)

Intellectual Property Rights - Historical perspective, characteristics and nature; World Intellectual Property Organization (WIPO); Forms of IPR - Copyright, Trademark, Patents

Practicals

1. Problems on measures of central tendency
2. Preparation of molar, normal and formal solutions
3. Preparation of buffer solutions and testing the pH using pH meter
4. Designing a project and execution using the techniques learnt in the course
5. Problems on IPR and Patents

Suggested Reading

1. Research Methodology: Methods and Techniques: C.R. Kothari
2. Fundamentals of Statistics: S.C. Gupta
3. Statistics for Research Students: Erich C. Fein, John Gilmour, Tanya Machin & Liam Hendry
4. Techniques and Methods in Biology: Ghatak K.L.
5. Principles and techniques of Biochemistry and Molecular Biology: Wilson and Walkers
6. Buffer solutions: The basics: Robert J. Beynon
7. Research design: John W Cresswell



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BLUEPRINT FOR SEMESTER END EXAMINATIONS PAPERSETTING

Learning Level-wise Weightage				
Bloom's Taxonomy level	Weightage	marks	Essay type	Short answer type
Knowledge/ Remember	33%	24	1	1 (1 out of 2)
Understanding/ Comprehension	27%	20		1 (1 out of 2)
Application/	20%	24	1	1 (1 out of 2)
Analysis	13%	16		11 (1 out of 2)
Synthesis/Evaluate	7%	16	1	2 (2 out of 4)
Total	100	100	3 questions	6 questions

S. No.	Module/ Chapter	Name of the chapter	50 Marks (MCQs)
1	Module-I	Unit-I	25 marks
2	Module-II	Unit-II	20 marks
3	Module-III	Unit-III	25 marks
4	Module-IV	Unit-IV	30 marks

Note: The questions with internal choice should be of same Bloom's level.



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Department of Zoology

Add-on course

Course Title: Research Methodology

Time: 3 Hours

70 M

MODEL PAPER

I. Answer any *FOUR* of the following: **54x5= 25**

Draw labeled diagrams wherever necessary

1. Anova
2. Autoclave
3. Laminar Air Flow
4. Electrophoresis
5. CPCSEA
6. WIPO

SECTION-B

II. Answer any *THREE* of the following: **3x15 = 45**

Draw labeled diagrams wherever necessary

1. Explain the measures of central tendency in brief.

(or)

Explain the procedure for preparation of protein stock solution using bovine serum albumin.

2. Describe methodology employed in animal cell culture using laminar air flow.

(or)

Write the principle and procedure with regards to separation of proteins using SDS PAGE.

3. Explain briefly various regulatory guidelines for research in biology.

(or)

Explain different forms of Intellectual Property Rights.



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Department of Zoology

Add-on course

Course Title: Research Methodology - Practical

Time: 1 1/2 Hours

30 M

MODEL PAPER

1. Problem / Case study related to Biostatistics - 10M
2. Chromatography / Electrophoresis / Spectrophotometric experiment ---- 10M
3. Problem on preparation of solutions / reagents ----- 5 M
4. Record & Viva-Voce---- 5M

External Examiner

Internal Examiner



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District Resource Centre & Center for Research Studies
Maddilapalem, VISAKHAPATNAM 530 013, Andhra Pradesh



Research Methodology Add-on Course 2022-23

LIST OF STUDENTS ENROLLED

S. No.	Name of the Student	Group	Registered Number
1	Anupaju Sravanthi	CBZ - EM	22BSBZ001
2	Budiredla Sharmila	CBZ - EM	22BSBZ008
3	Ch. Sarath Kumar	CBZ - EM	22BSBZ010
4	M. Nani	CBZ - EM	22BSBZ050
5	K. Padma	CBZ - EM	22BSBZ037
6	K. Sai Archana	MB.BT.C.	21209020
7	G. Tarun Gandhi	MB.BT.C.	21209005
8	K. Sruthi	M.B.C.	21210009
9	K. Mounika	MB.BT.C.	21210012
10	D. Pundarikaksha	MB.BC.C.	21208035
11	Bora Keerthana	M.Sc. Zoology	722228944006
12	G. Saichitanya	M.Sc. Zoology	722228944010
13	Thalluri Ratna Priya	M.Sc. Zoology	722228944021
14	Netheti Amrutha Varshini	M.Sc. Zoology	722228944025
15	Narava Surya	M.Sc. Zoology	722228944004
16	Ankamreddi Sujana	M.Sc. Zoology	722228944018
17	Bolem Divyasri	M.Sc. Zoology	722228944017
18	Killari Devi	M.Sc. Zoology	722228944024
19	Panchireddy Tulasi	M.Sc. Zoology	722228944016
20	Ponnada Jayashila	M.Sc. Zoology	722228944001
21	Maddala Sahithi	M.Sc. Biotechnology	722228904006
22	Bevara Pavan Kumar	M.Sc. Biotechnology	722228904007
23	Dhanyala Mounika	M.Sc. Biotechnology	722228904018
24	Padala Madhuri	M.Sc. Biotechnology	722228904021
25	Patnala Jyothi	M.Sc. Biotechnology	722228904022

Course Coordinator

Principal

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Research Methodology Add-on Course 2021-22

RESULTS

S. No.	Name of the Student	Group	Registered Number	Grade	Result
1	Anupoju Sravanthi	CBZ - EM	22BSBZ001	O	Pass
2	Budiredla Sharmila	CBZ - EM	22BSBZ008	O	Pass
3	Ch. Sarath Kumar	CBZ - EM	22BSBZ010	A	Pass
4	M. Nani	CBZ - EM	22BSBZ050	O	Pass
5	K. Padma	CBZ - EM	22BSBZ037	A	Pass
6	K. Sai Archana	MB.BC.C.	21209020	O	Pass
7	G. Tarun Gandhi	MB.BC.C.	21209005	O	Pass
8	K. Sruthi	MB.BC.C.	21210009	A	Pass
9	K. Mounika	MB.BC.C.	21210012	O	Pass
10	D. Pundarikaksha	MB.BC.C.	21208035	A	Pass
11	Bora Keerthana	M.Sc. Zoology	722228944006	O	Pass
12	G. Saichitanya	M.Sc. Zoology	722228944010	O	Pass
13	Thalluri Ratna Priya	M.Sc. Zoology	722228944021	O	Pass
14	Netheti Amrutha Varshini	M.Sc. Zoology	722228944025	A	Pass
15	Narava Surya	M.Sc. Zoology	722228944004	A	Pass
16	Ankamreddi Sujana	M.Sc. Zoology	722228944018	A	Pass
17	Bolem Divyasri	M.Sc. Zoology	722228944017	A	Pass
18	Killari Devi	M.Sc. Zoology	722228944024	O	Pass
19	Panchireddy Tulasi	M.Sc. Zoology	722228944016	A	Pass
20	Ponnada Jayashila	M.Sc. Zoology	722228944001	A	Pass
21	Maddala Sahithi	M.Sc. Biotechnology	722228904006	O	Pass
22	Bevara Pavan Kumar	M.Sc. Biotechnology	722228904007	O	Pass
23	Dhanyala Mounika	M.Sc. Biotechnology	722228904018	A	Pass
24	Padala Madhuri	M.Sc. Biotechnology	722228904021	A	Pass
25	Patnala Jyothi	M.Sc. Biotechnology	722228904022	A	Pass

Course Coordinator

Principal

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Value Added Course Certificate

2022 to 2023

This is to certify that Mr./Miss Bora Keerthana of
M.Sc. Zoology has successfully completed the Value Added Course in Research Methodology
with Regd No. 722228944006 Organized by the Department of Zoology in
collaboration with R & D cell during year 2022 to 2023 He/She has passed the course with
'O' grade.

Academic
Coordinator

IQAC
Coordinator

Course
Coordinator



PRINCIPAL

Dr. V.S. Krishna Govt. Degree College(A)





Dr. V. S. Krishna Govt. Degree College (A)

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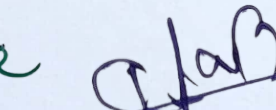


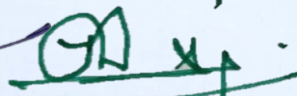
Value Added Course Certificate

2022 to 2023

This is to certify that Mr./Miss M. Nani of
CBZ-EM has successfully completed the Value Added Course in Research Methodology
with Regd No. 22BSB2050 Organized by the Department of Zoology in
collaboration with R & D Cell during year 2022 to 2023 He/She has passed the course with
'O' grade.


**Academic
Coordinator**


**IQAC
Coordinator**


**Course
Coordinator**




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Value Added Course Certificate

2022 to 2023


This is to certify that Mr./Miss Maddala Sahithi of M.Sc. Biotechnology has successfully completed the Value Added Course in Research Methodology with Regd No 722228944006. Organized by the Department of Zoology in collaboration with R & D Cell during year 2022 to 2023. He/She has passed the course with 'O' grade.


Academic
Coordinator


IQAC
Coordinator


Course
Coordinator




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PUPILS ATTENDANCE REGISTER

FOR THE MONTH OF

20

SCHOOL NAME :

CLASS :

SECTION :

Admission No.	Sl. No.	NAME OF THE PUPIL	CASTE																															No. of Days Present	Date of Birth	Previous Date of Adm.	Remarks
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
01		Anupaju Saavanthi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
02		Budireddy Shaamila		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
03		Ch. Sarath Kumar		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
04		M. Nani		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
05		K. Padma		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
06		K. Sai Archana		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
07		Gj. Tarun Gandhi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
08		K. Sauthi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
09		K. Mounika		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
10		D. Pundarikaksha		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
11		Bosa. Keerthana		X	X	X	X	X	Y	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
12		Gj. Saichaitanya		X	X	X	X	X	Y	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
13		Thaluri Ratnapriya		X	X	X	X	X	N	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
14		N. Amrutha Varshini		X	X	X	X	X	N	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
15		Narava Surya		X	X	X	X	X	S	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
16		Ankamreddi Sujana		X	X	X	X	X	S	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
17		Bolem Divyasa		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
18		Killari Devi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
19		Panchireddy Tulasi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
20		Ponnada Jayashila		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
21		Maddala Sahithi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
22		Bevara Pavan Kumar		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
23		Dhanyala Mounika		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
24		Padala Madhuri		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					
25		Patnala Jyothi		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X		X	X	X	X	X					

Number present { Morning Evening

6 Morning

No on Roll during month