



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)

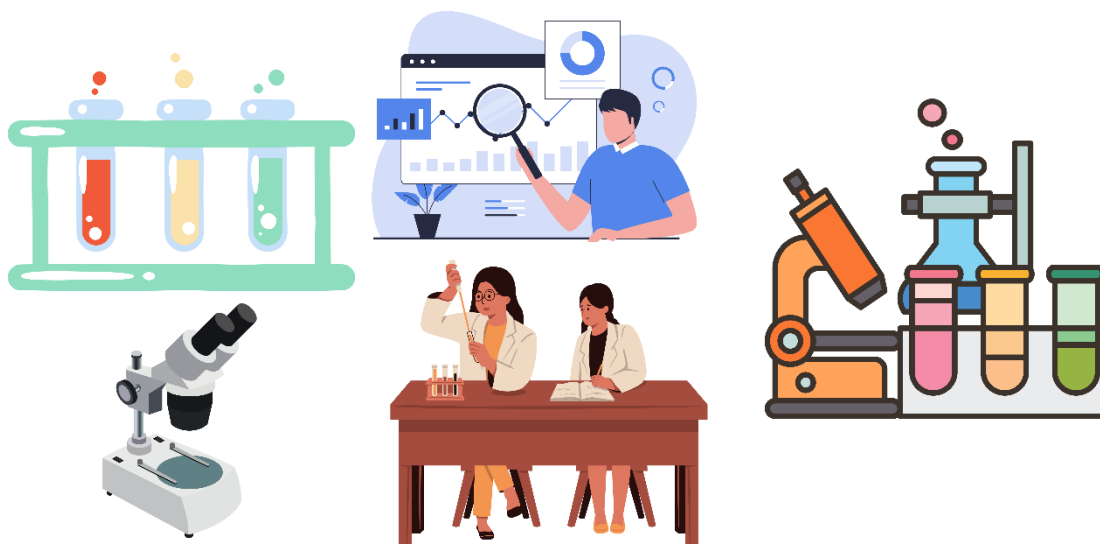
Add-on Course

2021-22

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)
Visakhapatnam
Sir,

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


Sub: Permission to start an Add-on course for 2021-22 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 14-10-2021

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. science stream students. 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.

Thanking you sir


Course Coordinator


HOD
Department of Zoology


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



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DEPARTMENT OF ZOOLOGY

Add-on Course for 2021-22

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.2021-22)

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 2021-22

LIST OF STUDENTS ENROLLED – 2021-22

S. No.	Name of the Student	Group	Registered Number
1	K.Nagendrakumar	CBZ - EM	21207036
2	P. Manasa Sai Lakshmi	CBZ - EM	21207064
3	G. Venkata Vinay	CBZ - EM	21207025
4	R. Saikumar	CBZ - EM	21207063
5	Kare Narasimha	CBZ - EM	21207030
6	Gokeda Yernikumari	CBZ - EM	21207024
7	R. Sricharith	MB.BT.C.	E20206026
8	R. Sreelekha	MB.BT.C.	E20206027
9	E. Revathi	MB.BC.C.	E20206024
10	Basava Bindu	M.Sc. Zoology	721228944018
11	Routu Indu	M.Sc. Zoology	721228944014
12	Talluri Sarjan Raju	M.Sc. Zoology	721228944013
13	Tegala Santhi Priya	M.Sc. Zoology	721228944002
14	Peddada Jerusha	M.Sc. Zoology	721228944003
15	Ganivada Geethanjali	M.Sc. Zoology	721228944019
16	Neethipalli Anusha	M.Sc. Zoology	721228944011
17	Pentakota Chandini	M.Sc. Zoology	721228944007
18	Mahanty Sriya	M.Sc. Zoology	721228944004
19	Rohini Gorle	M.Sc. Zoology	721228944016
20	Parupalli Shapona	M.Sc. Zoology	721228944021
21	Sheik Basheera	M.Sc. Biotechnology	721228904014
22	Kaicharla Bharani	M.Sc. Biotechnology	721228904019
23	Maradapudi Neeraja	M.Sc. Biotechnology	721228904024
24	Gavireddy Giriprakash	M.Sc. Biotechnology	721228904028
25	Reddy. Ankita	M.Sc. Biotechnology	721228904031

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	K.Nagendrakumar	CBZ - EM	21207036	O	Pass
2	P. Manasa Sai Lakshmi	CBZ - EM	21207064	O	Pass
3	G. Venkata Vinay	CBZ - EM	21207025	O	Pass
4	R. Saikumar	CBZ - EM	21207063	O	Pass
5	Kare Narasimha	CBZ - EM	21207030	A	Pass
6	Gokeda Yernikumari	CBZ - EM	21207024	A	Pass
7	R. Sricharith	MB.BC.C.	E20206026	O	Pass
8	R. Sreelekha	MB.BC.C.	E20206027	O	Pass
9	E. Revathi	MB.BC.C.	E20206024	O	Pass
10	Basava Bindu	M.Sc. Zoology	721228944018	O	Pass
11	Routu Indu	M.Sc. Zoology	721228944014	O	Pass
12	Talluri Sarjan Raju	M.Sc. Zoology	721228944013	A	Pass
13	Tegala Santhi Priya	M.Sc. Zoology	721228944002	A	Pass
14	Peddada Jerusha	M.Sc. Zoology	721228944003	O	Pass
15	Ganivada Geethanjali	M.Sc. Zoology	721228944019	A	Pass
16	Neethipalli Anusha	M.Sc. Zoology	721228944011	A	Pass
17	Pentakota Chandini	M.Sc. Zoology	721228944007	A	Pass
18	Mahanty Sriya	M.Sc. Zoology	721228944004	O	Pass
19	Rohini Gorle	M.Sc. Zoology	721228944016	A	Pass
20	Parupalli Shapona	M.Sc. Zoology	721228944021	O	Pass
21	Sheik Basheera	M.Sc. Biotechnology	721228904014	O	Pass
22	Kaicharla Bharani	M.Sc. Biotechnology	721228904019	O	Pass
23	Maradapudi Neeraja	M.Sc. Biotechnology	721228904024	O	Pass
24	Gavireddy Giriprakash	M.Sc. Biotechnology	721228904028	A	Pass
25	Reddy. Ankita	M.Sc. Biotechnology	721228904031	O	Pass

Course Coordinator

Principal

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VISAKHAPATNAM



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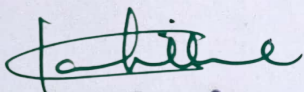
(NAAC ACCREDITED 'A' GRADE INSTITUTION & NODAL RESOURCE CENTRE)
MADDILAPALEM, VISAKHAPATNAM-530013. ANDHRA PRADESH

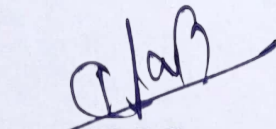


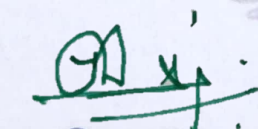
Value Added Course Certificate

2021 to 2022

This is to certify that Mr./Miss Basava Bindu of
M.Sc. Zoology has successfully completed the Value Added Course in Research Methodology
with Regd No. 711228944018 Organized by the Department of Zoology in
collaboration with R & D cell during year 2021 to 2022. He/She has passed the course with
'O' grade.


Academic
Coordinator


IQAC
Coordinator


Course
Coordinator




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Value Added Course Certificate

2021 to 2022.

This is to certify that Mr./Miss G. Venkata Vinay of
CBZ-EM has successfully completed the Value Added Course in Research Methodology
with Regd No. B1207035 Organized by the Department of Zoology in
collaboration with R & D cell during year 2021 to 2022. He/She has passed the course with
'O' grade.

Academic
Coordinator

IQAC
Coordinator

Course
Coordinator



PRINCIPAL

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

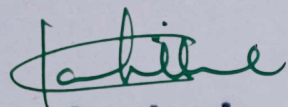
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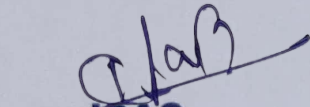


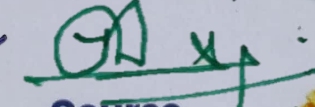
Value Added Course Certificate

2021 to 2022


This is to certify that Mr./Miss Reddy Ankita of M.sc. Biotechnology has successfully completed the Value Added Course in Research Methodology with Regd No. 721228904031 Organized by the Department of Zoology in collaboration with R & D cell during year 2021 to 2022. 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 APRIL 2024

SCHOOL NAME :

CLASS : SECTION :

Admission No.	Sl.No.	NAME OF THE PUPIL	CASTE	MONTH												MONTH												No. of Days Present	Date of Birth	Promotion Date of Admn	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		K. Nagendra 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	X	X	X	X				
02		P. Madasa Sai Lakshmi		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	X	X	X	X				
03		G. Venkata Vinjay		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	X	X	X	X				
04		R. Saikumar		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	X	X	X	X				
05		K. Narasimha		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	X	X	X	X				
06		Gokeda Venikumar		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	X	X	X	X				
07		R. Saicharith		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	X	X	X	X				
08		R. Sreelekha		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	X	X	X	X				
09		E. Revathi		X	X	X	X	X	X	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
10		Basava Bindu		X	X	X	X	X	X	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
11		Routu Indu		X	X	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
12		Talluri Sarjan Rayu		X	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	X	X	X				
13		Tegala Shanthi Priya		X	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	X	X	X				
14		Peddada Jerusha		X	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	X	X	X				
15		Ganivada Geetanjali		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	X	X	X	X				
16		Neethipalli Anusha		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	X	X	X	X				
17		Pentakota Chandini		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	X	X	X	X				
18		Mahanty Saiya		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	X	X	X	X				
19		Robini Gosle		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	X	X	X	X				
20		Parupalli Shapora		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	X	X	X	X				
21		Sheik Bhashceera		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	X	X	X	X				
22		Kaicharla Bhaarani		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	X	X	X	X				
23		Maradapudi Neeraja		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	X	X	X	X				
24		Gavireddy Giriprakash		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	X	X	X	X				
25		Reddy Ankitha		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	X	X	X	X				