

# Govt Naveen College Risali, Dist-Durg (C.G.)

## FOUR YEAR UNDERGRADUATE PROGRAM (2024-28)

### DEPARTMENT OF BOTANY

### COURSE CURRICULUM

VAC CERTIFICATE COURSE	CLASS TIME:-30 hrs
Lab and instrumentation	
<b>COURSE LEARNING OUTCOME:-</b>	
<b>1.</b> To make the students well versed with all the equipments of laboratory	
<b>2.</b> To enable them safe handling of instruments /equipments.	
<b>3.</b> Correct handling & use of instruments.	
<b>4.</b> Proper laboratory techniques and instruments handling lead to accurate, reliable results and safe working environment.	
<b>5.</b> Safety protocol and proper handling minimizes the risk of accidents, injuries, chemical exposure.	
<b>6.</b> Knowledge and effective use of equipments will enable us in maintaining an organized well managed lab, saves time, prevents delay in research projects.	
<b>7.</b> Hands on experience with correct technique help students and researchers acquire problem solving skills, fostering confidence and competence.	
<b>8.</b> Regular maintenance, proper cleaning and correct operation extend the life span of expensive, sophisticated instruments.	

### COURSE CONTENT:-

#### THEORY CONTENTS:

1. General introduction of Laboratory
2. Study of common laboratory equipments
3. Common laboratory reagents
4. Principle, working and applications of laboratory equipments.
5. Biochemical techniques.
6. Technique of proper & safe handling of instruments.
7. Safety measures and precautions
8. Implementations in research

#### Practical work:

1. Project writing
2. Preparation of working models
3. Preparation of static models
4. PowerPoint presentations

**REFERENCES:**

1. Botany lab essentials, Somnathkar *et al*, SAGA Publications,
2. Practicals in Plant physiology and Biochemistry, Bala *et al*.
3. Practical Botany Navbodh publications
4. Plant anatomy, Experiments and critical thinking, E.G. Cutler.
5. Modern practical botany, B.P Pandey.
6. Advanced practical Physical chemistry, Yadav, J.B.
7. Unified practical chemistry, Sahu, D.P & Bapat, K.N.
8. Basic principles of Practical chemistry, Venkteswaran *et al*.
9. Essentials of Analytical chemistry, Shobha & Banani.
10. S.S.Lal, Practical Zoology, Invertebrate.12<sup>th</sup> edition.
11. A Manual of practical Zoology. Dr. P.S Verma, S.Chand Publication, New Delhi.
12. A Laboratory manual, Practical Handbook of Cell biology.
13. A manual of Practical Zoology. Dr.P.S Verma, S.Chand Publication.
14. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop.
15. Engineering Practical Physics, S. Panigrahi & B. Mallick.
16. A text Book of Practical Physics, Indu Prakash
17. Practical Physics, R.P Goyal, Shivlal Publication.

**Suggested Continuous Evaluation Methods:**

**Maximum Marks: 50 Marks**

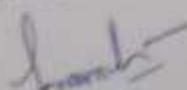
**Test : 30 Marks**

**Project : 10 Marks**

**Model /PPT/Seminar : 10**

**Name & Signature of Convener & Member**

Dr. Mamta



Mr. Shambhu P. Nirmalkar



Dr. Ritu Srivastava



Mr. Satish K. Gota



*ABU*  
Principal  
PRINCIPAL

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