

**Govt. Nagarjun PG Science College, Raipur (C.G.)**  
In collaboration with  
**Western Regional Instrumentation Centre (WRIC), Mumbai**  
Organizes  
Workshop  
on  
**Maintenance and Operation of Laboratory Equipments**  
**04<sup>th</sup> to 8<sup>th</sup> October 2021**

□ **Programme Schedule** □

**Morning session : 10.00 a.m. to 1.00 p.m.**

**Afternoon session: 2.00 p.m. to 5.00 p.m.**

Day & Date	10.00 a.m. - 11.30 a.m. (only lecture)	11.30 a.m. -1.00 p.m.	2.00 p.m. -5.00 p.m.	Remark
<b>Monday</b> <b>04-10-2021</b>	<b>Inauguration and inaugural lecture on basic electronic components and Introduction to Analytical Instruments (NNR)</b>	Lab session (physics department)	Lab session (physics department)	Lab sessions will be Conducted every day at same place from 04 oct. to 8 oct. 2021
	<b>Computer And accessories MAT</b>	Lab session (IT department)	Lab session (IT department)	
<b>Tuesday</b> <b>05-10-2021</b>	<b>Lecture on pH Meter &amp; Conductivity Meter (NNR)</b>	Lab session (Chemistry dept.)	Lab session continued (Chemistry Dept.)	
<b>Wednesday</b> <b>06-10-2021</b>	<b>Lecture on Electrical Instruments (SKB)</b>	Lab session (physics department)	Lab session continued (physics department)	
<b>Thursday</b> <b>07-10-2021</b>	<b>Lecture on Colorimeters &amp; Spectrophotometers (NNR)</b>	Lab session (Chemistry dept.)	Lab session (Chemistry dept.)	
<b>Friday</b> <b>08-10-2021</b>	<b>Lecture on Microscopes (MS)</b>	Lab session (Botany Department)	Lab session (Botany Department)	

NNR : N N Rao SKB :Sudhir Kumar Bhagat, MBS :Milind Bhalachandra Shidruk, GDC:Govind Devram Chitte  
MAT : Moosa Adam Thakur, DMG :Devendra Mahadeo Gunde

WESTERN REGIONAL INSTRUMENTATION CENTRE, MUMBAI  
(*A National Facility Centre For Instrumentation By UGC*)

Training programme on Maintenance of Electronic Laboratory Instruments

(Analytical Instruments)

**Couse Outline**

Theme of this program is going to be Maintenance of Opto-Analytical Instruments of Chemistry, Botany, Zoology and life sciences.

Topics Broadly divided into three categories namely Analytical Instruments, Electrical Instruments and Optical Instruments.

There will One lecture very day on topic related to above instruments followed by Laboratory sessions.

Details As follows

**Lecture**

Introduction to Basic Electronic components and Introduction to Analytical Instrumentation

**Lab session**

- Soldering and de soldering of components on P.C.B
- Identification and testing of components
- Practical calculation of R, V, I, Using R-network

**Laboratory session on Analytical Instruments**

**Ph meter**

- Hands on experience on ph meter
- Electronic Calibration of PH meter
- Calibration PH meter with PH electrodes and buffers by calculating Slope.
- Proper handling of electrode, buffer solution
- Maintenance of PH electrode
- Study of PH meter circuit
- Servicing of PH meter

**Colorimeter**

- Hands on experience on colorimeter
- Study of various components present in colorimeter.

- Calibration of Colorimeter
- Study of colorimeter meter circuit
- Servicing of instrument

### **Spectrophotometer**

- Hands on experience on Spectrophotometer
- Understanding the difference between colorimeter and Spectrophotometer
- Study of spectrum generation in a monochromator of Spectrophotometer
- Lamp replacement procedure in Spectrophotometers
- Lamp alignment checking procedure
- Wavelength Calibration
- Servicing of Spectrophotometer
- Instrument handling tips

### **Conductivity meter**

- Hands on experience on conductivity meter
- Electronic Calibration of conductivity meter by using standard resistors.
- Calibration of conductivity meter using Standards
- Servicing of conductivity meters

### **Laboratory session on microscopes**

- Introduction of Microscopes
- Types of Microscopy
- Detail Parts of the Microscope
- Routine Operation of the Microscope
- Repair & Maintenance on the Microscope
- Handling and Care of the Microscope
- Materials for Care and Maintenance
- Fungal Growth on the Microscope
- Dos for Good Microscopy
- Don'ts for Good Microscopy
- Other than Repair/Service of microscope on request

## **Laboratory Sessions on Electrical Instruments**

- Introduction of electrical instruments
- Study and understanding of all electrical components

### **Heating instruments**

- Working principle of heating instruments
- Types of heating coils.
- Types of heating control (energy regulator, thermostat, and digital temp controller)
- Difference between incubator, oven and furnace
- Care of handling of water bath and Autoclaves or water based heating instruments.
- Repairing of heating mantles

### **Motor based instruments.**

- Principal of motors
- Types of motors
- Centrifuge, magnetic stirrer, shaker
- Speed control and inter locking of motor based instruments.
- Preventive care of all types electrical instruments.