



## Department of Chemistry

Pravara Medical Trust's,  
**Arts, Commerce & Science College, Shevgaon.**  
Tal-shevgaon Dist.-Ahmednagar 414502.

Certificate Course on Instrument Handling

2018-19

## INDEX

### ❖ Instrument Handling Certificate Course Syllabus

Instrument	Topics
1) Conductometer	i) Principle ii) apparatus iii) setup iv) calibration v) working (explanation with the help of experiment) vi) calculation
2) Potentiometer	i) Principle ii) apparatus iii) setup iv) calibration v) working (explanation with the help of experiment) vi) calculation
3) Colorimeter	i) Principle ii) apparatus iii) setup iv) calibration v) working (explanation with the help of experiment) vi) calculation
4) Viscometer	i) Principle ii) apparatus iii) setup iv) calibration v) working (explanation with the help of experiment) vi) calculation
5) P <sup>H</sup> -Meter	i) Principle ii) apparatus iii) setup iv) calibration v) working (explanation with the help of experiment) vi) calculation
6) Turbidimeter	i) Principle ii) apparatus iii) setup iv) calibration v) working (explanation with the help of experiment) vi) calculation



## Details:

### 1) Conductometer:

- Principle (electrical conductance-conc of ion, temperature, mobility of ion), electrode -(platinum),
- Apparatus (cell-electrolytic solution preparation, magnetic stirrer),
- Setup-(connecting electrode to instrument)
- Calibration -(standardisation of instrument, preparation of standard solution)
- Working-(conductometric titration i) Acid-Base Titration, ii) Precipitation titration, iii) Redox (oxi-red) Titration.
- Calculation-Strength of an acid(equivalence point)

### 2) Potentiometer:

- Principle (potential difference between two electrode),
- electrode i) Reference electrode and indicator electrode -(hydrogen & silver chloride),
- Apparatus (cell-electrolytic solution preparation, magnetic stirrer),
- Setup-(connecting electrode to instrument)
- Calibration -(standardisation of instrument, preparation of standard solution)
- Working-(Potentiometer titration i) Acid-Base Titration, ii) Precipitation titration, iii) Redox (oxi-red) Titration.
- Calculation-Strength of an acid(equivalence point)

### 3) Colorimeter:

- Principle (Lambert-Beer's law), setup, standardization,
- Apparatus-(cuvette) solution preparation,)
- Calibration -( Blank solution preparation standardisation of instrument,
- Working-(colorimetric titration i).
- Calculation-concentration of an acid. Plot of graph.

### 4) Viscometer:

- Principle (To calculate density, viscosity)



- Concept- shear stress, Poiseuille's law, viscous resistance.
- Setup, cleaning, Apparatus-(stand, viscometer) solution preparation,)
- Working: finding time taken by liquid to travel through capillary from point A to B in viscometer.

### 5) PH-meter:

- What is  $p^H$ -metry, Definition of  $p^H$ -meter,  $p^H$  measurement,
- $p^H$  meter working principle,
- Part of pH mete, parts of combined electrode,
- operating procedure  $p^H$  meter,
- How to calibrate  $p^H$  meter, Type of  $p^H$  -meter,
- Type of  $p^H$  -meter based on portability,
- What  $p^H$  electrode, Construction of  $p^H$  electrode,
- How  $p^H$  electrode works, Types of  $p^H$  electrodes,
- Application of  $p^H$  meter,
- Advantages of  $p^H$  meter, limitation of  $p^H$ -meter,
- How to use  $p^H$  -meter(Working- suitable experiment),
- Application of  $p^H$  meter in water analysis.

### 6) Turbidimeter:

- Principle, instrumentation,
- setup, standardization, Measurement of turbidity of water sample,
- Apparatus-cuvettes,
- Calibration – (solution preparation, Working-Analysis of water sample)
- Calculation-concentration of suspended particle. Plot of graph.

\*\*\*\*\*



Name & Signature:

	Departmental member
HOD (Chairman)..... <i>Prof. Funder S.R.</i>	1..... <i>Funder</i> <i>Head of Department.</i>
Subject Expert ..... <i>Prof. Arvind Shinde</i> (Other College)	2..... <i>Arvind.</i>
Subject Expert ..... <i>prof. Ganesh Kale</i> (Other College)	3..... <i>ganesh kale</i>
Representative ..... <i>prof. Bedre.</i> (Science Faculty)	4..... <i>Bedre</i>
Coordinator..... <i>prof. Navawade V.R.</i>	5..... <i>Navade</i>

