

**Academic Council Meeting No. and Date : 03 / February 14, 2022**

**Agenda Number : 6**

**Resolution Number : 12 / 5.2**



**Vidya Prasarak Mandal's  
B. N. Bandodkar College of  
Science (Autonomous), Thane**



**Certificate Course**  
**in**  
**Instrumentation & Preparation of**  
**Standard Solutions**  
**With effect from**  
**Academic Year 2022-2023**

## Preamble

The famous adage says “It is not the degree but the skills that takes you so far”, understanding the importance of skill development and value enhancement programmes in consonance with degree, to meet the basic demands of industries, Department of Chemistry designed a skill oriented and value added certificate course titled “Certificate Course in Instrumentation and Preparation of Standard Solutions” to achieve a specific level of competency among students.

The knowledge enrichment course provide students an opportunity to enhance their skills and knowledge in selected areas and acquire additional skills which benefits them in the professional world.

The syllabus of course is prepared by chemistry department on their own keeping in view the subject specific academics need, industrial demands and market requirements with the help of the subject experts.

## OBJECTIVES:

- To provide a wide spectrum of knowledge, skills in preparing a standard solutions of different concentrations with minimum errors and maximum accuracy.
- To build up a confidence and skills in them in handling any instrument used in various estimations.
- To review the basic principles of the analytical procedure and instruments commonly used in industries such as analytical terms and tools, calibration of glassware, theory of indicators etc.

## DESIRED OUTCOME:

- To brand students independent in constructing curves/plots using which evaluation of exact amount or strength of selected component present in unknown sample.
- To impart skills which they require while seeking jobs and to sharpen their knowledge and need to understand concepts and issues at their workplace.

**Eligibility:** T.Y. B.Sc.

**VPM's B.N.Bandodkar College of Science (Autonomous), Thane**

## Structure of Programme

CourseCode	Course Title	No. of lectures	Credits
<b>BNBCCSS1T1</b>	Instrumentation & Preparation of Standard Solutions	<b>16</b>	<b>3</b>
<b>BNBCCSS1P1</b>	Practicals	<b>29</b>	

## Syllabus of

### **Course: Techniques in Molecular Biology (Level 1: Basic)**

Course Code	Course Title	Credits	No. of lectures	Practical Duration
<b>BNBCCSS1T1</b>	<b>Instrumentation &amp; Preparation of Standard Solutions</b>	<b>3</b>		

<b>Unit I</b>	<b>Introduction</b> Accuracy, precision, calibration of glass wares and its importance	<b>2</b>	<b>2</b>
<b>Unit II</b>	<b>Chemical Calculations</b> Normality, Molarity, Molality, Formality, ppm, ppb, Millimoles, Milliequivalents, Mole fraction, Weight ratio, Volume ratio and weight to volume ratio.	<b>2</b>	<b>2</b>
<b>Unit III</b>	<b>Standard solutions</b> Concept of Primary standard solution and Secondary standard solution.	<b>2</b>	<b>2</b>
<b>Unit IV</b>	<b>Titrimetric analysis</b> Types of reactions and construction of titration curves.	<b>2</b>	<b>3</b>
<b>Unit V</b>	<b>Indicators</b> Theory of indicators, Preparation of indicators, Types of indicators, Mechanism of indicator action	<b>3</b>	<b>3</b>
<b>Unit VI</b>	<b>Instrumental techniques</b>	<b>5</b>	<b>5</b>
	<b>i. Flame Emission spectrophotometer</b>	<b>-</b>	<b>3</b>
	<b>ii. Spectrophotometer</b>	<b>-</b>	<b>3</b>
	<b>iii. pH-meter</b>	<b>-</b>	<b>2.5</b>
	<b>iv. Potentiometer</b>	<b>-</b>	<b>2.5</b>
	<b>v. Conductometer</b>	<b>-</b>	<b>2</b>
	<b>Total Period = 45</b>	<b>16</b>	<b>29</b>

## Evaluation Scheme

### 1. Theory Examination: Suggested Format of Question paper

**Duration: 1.0 Hours**

**Total Marks: 30**

**All questions are compulsory**

Sr.No	Unit	Marks
<b>Q. 1</b>	Based on Unit I	5
<b>Q. 2</b>	Based on Unit II	5
<b>Q. 3</b>	Based on Unit III	5
<b>Q. 4</b>	Based on Unit IV	5
<b>Q. 5</b>	Based on Unit V	5
<b>Q. 6</b>	Based on Unit VI	5

All the questions are multiple choice questions. Each question carries 1 mark.

**1. Internal Assignments have to be submitted in the hard copy format in the department.**

**Total number of assignments: 01**

**Total marks: 20**

### 2. Practical Examination

Particular	Practical	Viva	Total
Practical	40	10	50

**Total of Internal Assignments**

**20 Marks**

**Total of Theory Examination**

**30 Marks**

**Total of Practical Examination**

**50 Marks**

**Grand Total**

**100 Marks**

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