

Managed by Vanita Vishram, Surat

# Sheth P.T. Mahila College of Arts and Home Science

Certificate Course On

"Instrumental Techniques for Chemical Analysis"

## Introduction :

Chemical instrumentation is increasingly important in providing so much of the data necessary for industry, health science, environment protection, food production and basic research to mention just a few areas. Instrumentation fills only part of the need, as the challenges presented often require highly developed skills and judgement of chemists using these in order for the best results to be obtained.

This course aims at developing knowledge, experience and skills related to a variety of instrumental techniques in the areas of electrochemistry and separation science.

## Best Wishes....

"Education is not the amount of information that is put into your brain and runs riot there, undigested all your life. We must have life-building, man-making, character-developing, assimilation of ideas. If you have assimilated these ideas and made them your life and character, you have more education than a man who has got a whole library by heart". - Swami Vivekananda



Firstly, I would like to extend a warm welcome to all students and distinguished speakers, who have shown a keen interest in the short-term certificate course "Instrumental Techniques for Chemical Analysis". The main objective of this course is to develop knowledge, experience and skills related to a variety of instrumental techniques, which could be helpful to the students in their career.

I congratulate the concerned department of Sheth P.T. Mahila College of Arts & Home Science for taking such an initiative and offering this value-added short-term certificate course to the students. I wish all the very best to the young learners and pray for their bright future.

Dr. Pradip K. Desai

Chairman, Surat Administrative Committee

Vanita Vishram, Surat

## Best Wishes....

Sheth P.T. Mahila College of Arts and Home Science is passing through an important phase of its growth. The college launched the Science Faculty in the academic year 2017-18 which offers specialization in Chemistry and Microbiology (English Medium – Self-Finance).



It gives me immense pleasure to welcome all the students and distinguished speakers, who have shown keen interest in this short-term certificate course "Instrumental Techniques for Chemical Analysis". We take great pride in the fact that our students receive the best quality education. This is made possible by following very high standards of teaching & learning practices. Our excellence is not just confined to the classroom. We are also notably active in conducting conferences, workshops, seminars, talks, guest lectures and other co-curricular/extra-curricular activities. These activities offer exposure to the students on the aspects beyond the curriculum and thereby add great value to their professional success.

I am confident that the course would be helpful in fulfilling the educational aspirations of the students.

Warm Regards

Dr. Khushman Dholawala

(I/c Principal)

## Contents

### The course contents include:

- Basic electro-chemical methods (15 hours)
- Separation methods (15 hours)

30 Hours

### Certificate Coursework:

2 to 3 hours / once or twice a week x 15  
Starting from 15<sup>th</sup> July, 2019

### Topics:

#### (1) Basic Electro-chemical Methods (15 hours)

##### Theoretical and Practical sessions of:

##### (A) Conductometric titrations:

###### Acid-Base titrations

- Strong Acid v/s Strong Base
- Strong Acid v/s Weak Base
- Weak Acid v/s Strong Base
- Weak Acid v/s Weak Base
- Mixture of Acids (Strong +Weak) v/s Strong or Weak Base

###### Precipitation titrations

- BaCl<sub>2</sub> v/s K<sub>2</sub>CrO<sub>4</sub>
- NaCl v/s AgNO<sub>3</sub>

##### (2) Separation Methods (15 hours)

###### Chromatography theory

- Liquid chromatography modes and mechanisms
- High-pressure liquid chromatography (HPLC)
- Ion-exchange
- Adsorption
- Partition and permeation
- Open column, thin layer and paper chromatography
- Gas chromatography
- Theory
- Instrumentation
- Operation

###### Learning Outcomes

On successful completion of the course, the students will be able:

- to develop expertise relevant to the professional practice of chemistry.
- to develop an understanding of the range and theories of instrumental methods available in analytical chemistry.
- to develop knowledge pertaining to the appropriate selection of instruments for the successful analysis of complex mixtures.
- to develop an understanding of the role of the chemist in measurement and problem-solving in chemical analysis.
- to provide an understanding of and skills in advanced methods of separation and analysis.
- to expand skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments.

###### Proposed Tutors/ Speakers

###### Dr. Ashwin S. Patel (M.Sc., B.Ed., M.Phil., Ph.D.)

He is a recognized Ph.D. Supervisor and Guide as well as Principal of Navyug Science College, Surat. He is also a syndicate member of VNSGU. Formerly, he was also appointed as a Dean of Faculty of Science, VNSGU.

###### Dr. Ketan Desai (M.Sc., Ph.D.)

He is working as an Associate Professor at Sir P.T. Sarvjanik College of Science, Surat.

###### Dr. Shambhav Vora (M.Sc., Ph.D.)

He is Associate Professor at Sir P.T. Sarvjanik College of Science, Surat.

###### Dr. Dharmesh Varade, Ahmedabad University, Ahmedabad

He has been working as Associate Professor in School of Engineering and Applied Science, Ahmedabad University since September 2014. Earlier, he worked as a Post-doctoral Researcher at several reputed institutes like Kawamura Institute of Chemical Research, Japan; University of Paris XI, France (CNRS Fellowship), University College Dublin, Ireland (Marie Curie SOCON Fellowship); and Yokohama National University, Japan (JSPS Fellowship).

###### Dr. Naved Malek, SVNIT, Surat

He is working as an Associate Professor in Applied Chemistry Department, S.V.N.I.T., Surat. He has done his post-doctoral fellowship from Instituto de Quimica, Universidade de Sao Paulo, Sao Paulo, Brazil. He has also worked as a Research Associate with Cadila Pharmaceutical, Ahmedabad.

###### Dr. Yogesh Kadam, SPTMC, Vanita Vishram, Surat (Course Co-ordinator)

He is working as an Assistant Professor at Chemistry Department, SPTMC, Vanita Vishram, Surat. He has worked as a Teaching Assistant with SVNIT for four years. He has done his two post-doctoral fellowships from ESPCI, Paris, France and IBMM, Montpellier, France.

###### Who Can Participate?

- B.Sc., M.Sc. & Ph.D. Students
- Professionals working in industry
- Any other interested individuals can apply

###### Course Fee:

Rs. 1000/-

Venue: SPTMC, Vanita Vishram, Surat

