



Shri Shivaji Education Society, Amravati's  
**Shri Shivaji Science College, Amravati**

Accredited by NAAC with 'A' Grade  
Identified as UGC- CPE, DST- FIST & SGBAU- Lead College  
Shivaji Nagar, Amravati, MS - 444603



## Six Days Hands on Training Course on Advanced Instrumentation Techniques and Their Practical Applications for PG and Research Students



**Duration : 12<sup>th</sup> to 17<sup>th</sup> September, 2022**

### Course Description:-

Now a day candidates with core analytical skills, sound knowledge and practical significance and troubleshooting of different sophisticated analytical instruments are appreciated and required by all the research, manufacturing, processing and contract manufacturing industries as well as government & public testing labs.

This course gives huge scope and ample opportunities in different industries like Food, pharmaceuticals, agrochemicals, fine chemicals, cosmetics, oil and paints perfumery, beverages, rubbers, plastics, clinical research, forensic, public testing labs, etc. . Dr. Shrikant A. Wadhal, course coordinator and Mr. Amol Gawande, Scientist, Peaks Analytical and Research Centre, Nagpur, Mr. Satish Dashore will provide hands on training regarding some latest instruments like HPLC, Atomic absorption, Spectrophotometer, IR, UV-VIS, XRD used in laboratories.

### This course is designed for:

- PG and research students intending to work in a laboratory with scientific instrumentation.
- Students preparing for Industrial jobs after completion of PG and Ph.D. degree.
- The course is designed for 40 hrs under value added course.

### COURSE LAYOUT

(1) Course will begins with scope, applications and opportunities of Instrumental techniques (HPLC, AAS, IR, XRD,UV-Vis). (2) Instrumentation, theory, calibration, operation, trouble shooting, practical demonstration of HPLC. (3) Instrumentation, theory, calibration, operation, sampling practical demonstration, data collection of Atomic absorption, Spectrophotometer. (4) Instrumentation, theory, calibration, pallate formation, practical demonstration of Infra Red spectrophotometer. (5) Instrumentation, theory, calibration, operation, practical demonstration, data collection of XRD. (6) Instrumentation, theory, calibration, operation, practical demonstration with examples of UV-Visible. (7) Explanation of chemical drawings of reactions through Chem Draw, Isis Draw in MS Word . 8. Good laboratory practices, good chromatographic practices

**COURSE TYPE:** Value Added Course

**COURSE LEVEL:** PG and Research Students.

### 1. Course Objectives:-

- To impart the required knowledge of Industrial Scope, Applications & Opportunities for Chemistry
- To impart the required knowledge, necessary skills & to provide the exposure to modern & sophisticated techniques of analysis that are being used all over the world including industries, government & public testing labs.
- Theoretical knowledge of HPLC, Atomic absorption, Spectrophotometer and IR, UV-Visible, XRD equipments.
- Practical knowledge on HPLC, AAS and IR, XRD and UV-Visible equipments.
- To operate and to maintain the HPLC, AAS and IR and XRD UV-Visible equipments.
- Instrumentation, Calibration and their practical applications in Industries.
- Wide courage will be given to Trouble shooting, Operation and method development skills.
- Perform cleaning evaluation on equipment for drug substance and residual detergents.
- Additionally, the course provides introduction to ChemDraw, Isis Draw software for chemical drawings in MS Word.

### 2. Instructional strategies:-

- Submission of assignments after completion of session.
- Interactive session of students and resource person so as to solve difficulties of students.

### 3. Instructional Material:-

- Power point presentations related to the theory of instrumentations.
- Videos of practical demonstration of Gas chromatography, HPLC and IR equipments.
- Soft copies of notes related to the topics covered.
- Chem Draw, Isis Draw software for chemical drawing.

### 4. Summary:-

Upon successful completion of this course, the students will be able to:

- Rectify simple problems with sample preparation or data acquisition.
- Operate the HPLC, AAS, XRD, IR, UV-Visible instruments independently.
- Perform the trouble shooting in HPLC.
- Create sample reports including data from the HPLC, AAS, instrument, XRD, IR, UV-Visible equipments.



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- Know the applications of these instruments in various Industries which are helpful in job opportunity.
- Set up their own laboratory for business purpose.
- Draft a section of a resume to include this hands on training course with specific instruments.
- Draw chemical drawings of reactions through ChemDraw, Isis Draw in MS Word related to their project work of PG and research work of Ph.D. degree.

### 5. Evaluation Strategies:-

- Certificates will be provided to the students with A, B, C grade depending on score secured. (A > 90%, B > 80%, C > 60%)
- 40% marks will depend on assignment submitted and 60% marks will depend on final examination score.

### 6. Duration of the Course:-

- The duration of the course is ( 12/09/2022 to 17/09/2022 ).
- Demonstration of practical, hands on training and discussion through interactive session after completion of each session.

### - Course Session Plan -

#### Monday, 12.09.2022

11.00 - 12.00 p.m. Inauguration & Theoretical session of HPLC  
12.30 - 01.00 p.m. Tea Break  
01.00 - 05.00 p.m. Hands on Practical session of HPLC

#### Tuesday, 13.09.2022

11.00 - 12.00 p.m. Theoretical session of trouble shooting, IR  
12.30 - 01.00 p.m. Tea Break  
01.00 - 05.00 p.m. Hands on Practical of IR

#### Wednesday, 14.09.2022

11.00 - 12.00 p.m. Theoretical session of XRD  
12.30 - 01.00 p.m. Tea Break  
01.00 - 05.00 p.m. Hands on Practical session of X-Ray Diffraction technique (XRD)

#### Thursday, 15.09.2022

11.00 - 12.00 p.m. Theoretical session of UV VISIBLE spectroscopy  
12.30 - 01.00 p.m. Tea Break  
01.00 - 05.00 p.m. Hands on Practical session of UV VISIBLE spectroscopy

#### Friday, 16.09.2022

11.00 - 02.00 p.m. Hands on training and Quiz and Assignment Submission  
02.00 - 03.00 p.m. Tea Break  
03.00 - 05.00 p.m. First Examination

#### Saturday, 17.09.2022

10.00 - 12.00 p.m. Theoretical session of Atomic Absorption spectrophotometer  
12.00 - 01.00 p.m. Tea Break  
01.00 - 04.00 p.m. Hands on Practical session of Atomic Absorption spectrophotometer  
04.15 - 05.15 p.m. Final Examination  
05.15 - 06.15 p.m. Valedictory Function

**Organized by**  
**Department of Chemistry**

**- Contact for Details -**

**Dr. Shrikant A. Wadhal**

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**- Course to be Conducted by -**

**Dr. G. V. Korpe**  
**Principal**

**Dr. S. K. Rithe**  
**Head of the Department**

**Dr. Shrikant A. Wadhal**  
**Course Coordinator**

**Last Date of Registration :**  
**11th September, 2022**