

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

SKILL DEVELOPMENT CENTRE

Syllabus Structure

Course Title: “Certificate Course in Instrumental Methods of Chemical Analysis.”

Course Duration: 6 Months

Tentative Fees: Rs.1000 per Student

Minimum Admission Eligibility for Student: Science Graduate

Need of Course:

- 1) Achieve task in less time with more results.
- 2) Increase in analysis performance level.
- 3) Grow skill sets and instrumental proficiency.
- 4) It comes up to be an important part of any individual career.
- 5) Increase productivity.

Employment and Entrepreneurship Opportunities From Course:

- 1) The employability skills consist of: time management, ability to self- manage, working as a part of team, adaptability to different roles, the potential to lead by influence and ability to understand the business environment.
- 2) Provide Industry-specific training to unemployed and underemployed youth.
- 3) Enhance an individual’s employability to adapt changing technologies and labour market demands.
- 4) Improve productivity and living standards of the people.
- 5) Create job opportunities for trained students.

SKILL DEVELOPMENT CENTRE

Syllabus Structure

Name of Skill Course	Duration	Name of Paper	Paper	Hours Per Paper	Th.	Int.	Pract.	Credits
Certificate Course in	6 Months	Theory	I	45	80	20	0	3 Credits
			II	45			100	3 Credits
			III	45			100	3 Credits
			IV	45	80	20	0	3 Credits
Total				180	160	40	200	12 Credits

Abbreviations:

Th.- Theory Evaluation (External)

Int.- Internal Evaluation (Internal)

Pract.- Practical Evaluation.

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SKILL DEVELOPMENT CENTRE

Course Title :“Certificate Course in Instrumental Methods of Chemical Analysis.”

1)	Paper Title	Principle, Instrumentation, Working of Sophisticated Instruments (Theory)			
2)	Paper No	I			
3)	Objectives of Paper	1. To educate students about theoretical aspects of instruments			
		2. To train students with instrument handling			
		3. To understand the use of sophisticated instruments			
		4. To educate students for standardization & optimization of parameters of concerned instrumental methods of Analysis.			
		5. To enable students in data interpretation.			
		6. To make students competent with analytical skills required for jobs in Chemical/pharmaceutical industries.			
		7. To make awareness about maintenance of instrument, cleanliness and Safety.			
		8. Enhance Research Interest among students.			
4)	Expected out comes from paper	1. Enhancement in quality with error minimization in sample testing			
		2. Skill development in instrument handling			
		3. Expertise in sample analysis & data interpretation			
		4. Skilled human resource generation			
		5. Generation of skilled manpower to cater the need of chemical & pharmaceutical industries			
5)	Content	Unit-1.	Atomic Absorption Spectroscopy (AAS)	Hour	11
		Unit-2.	X-Ray Diffraction Spectroscopy (XRD)	Hour	12
		Unit-3.	Thermogravimetric Spectroscopy (TGA)	Hour	11
		Unit-4.	Differential scanning calorimetry (DSC)	Hour	11

6)	Reference Book	1) A Text Book of Quantitative Chemical Analysis. AI Vogel. 2) Instrumental Methods of Chemical Analysis. Chatwal and Anand. 3) Instrumental Methods of Analysis. Willard Dean Meritt. 4) Basic Concepts of Analytical Chemistry. S M Khopkar. 5) Practical Chemistry. VK Ahluwalia, Dhingra, Gulati. 6) Introduction to Spectroscopy. Donald L. Pavia 7) Spectrometric Identification of Organic Compounds. R.M.Silverstein
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1)	Paper Title	Principle, Instrumentation, Working of Sophisticated Instruments (Theory)
2)	Paper No	IV
3)	Objectives of Paper	1. To educate students about theoretical aspects of instruments 2. To train students with instrument handling 3. To understand the use of sophisticated instruments 4. To educate students of standardization & optimization of parameters 5. To enable students in data interpretation. 6. To make students competent with analytical skills required for jobs in Chemical/pharmaceutical industries. 7. To make awareness about maintenance of instrument, cleanliness and Safety. 8. Enhance Research Interest among students.
4)	Expected out comes from paper	1. Enhancement in quality with error minimization in sample testing 2. Skill development in instrument handling 3. Expertise in sample analysis & data interpretation 4. Skilled human resource generation 5. Generation of skilled manpower to cater the need of chemical & pharmaceutical industries

5)	Contents	Unit-1.	Nuclear Magnetic Resonance Spectroscopy (NMR)	Hour	12
		Unit-2.	Infrared Spectroscopy (IR)	Hour	11
		Unit-3.	High-performance liquid chromatography (HPLC)	Hour	11
		Unit-4.	Gas chromatography–mass spectrometry (GCMS)	Hour	11
6)	Reference Book	1) A Text Book of Quantitative Chemical Analysis. AI Vogel. 2) Instrumental Methods of Chemical Analysis. Chatwal and Anand. 3) Instrumental Methods of Analysis. Willard Dean Meritt. 4) Basic Concepts of Analytical Chemistry. S M Khopkar. 5) Practical Chemistry. VK Ahluwalia, Dhingra, Gulati. 6) Introduction to Spectroscopy. Donald L. Pavia 7) Spectrometric Identification of Organic Compounds. R.M.Silverstein			

1)	Paper Title	Instrumentation, working, sample analysis and data interpretation (Lab. Training)
3)	Paper No	II
4)	Objectives of Paper	1. To educate students about theoretical aspects of instruments
		2. To train students with instrument handling
		3. To understand the use of sophisticated instruments
		4. To educate students of standardization & optimization of parameters
		5. To enable students in data interpretation.
		6. To make students competent with analytical skills required for jobs in Chemical/pharmaceutical industries.
		7. To make awareness about maintenance of instrument, cleanliness and Safety.
		8. Enhance Research Interest among students.

5)	Expected out comes from paper	1. Enhancement in quality with error minimization in sample testing			
		2. Skill development in instrument handling			
		3. Expertise in sample analysis & data interpretation			
		4. Skilled human resource generation			
		5. Generation of skilled manpower to cater the need of chemical & pharmaceutical industries			
6)	Content	Unit-1.	Atomic Absorption Spectroscopy (AAS)	Hour	11
		Unit-2.	X-Ray Diffraction Spectroscopy (XRD)	Hour	12
		Unit-3.	Thermogravimetric Spectroscopy (TGA)	Hour	11
		Unit-4.	Differential scanning calorimetry (DSC)	Hour	11
7)	Reference Book	1) A Text Book of Quantitative Chemical Analysis. AI Vogel. 2) Instrumental Methods of Chemical Analysis. Chatwal and Anand. 3) Instrumental Methods of Analysis. Willard Dean Meritt. 4) Basic Concepts of Analytical Chemistry. S M Khopkar. 5) Practical Chemistry. VK Ahluwalia, Dhingra, Gulati. 6) Introduction to Spectroscopy. Donald L. Pavia 7) Spectrometric Identification of Organic Compounds. R.M.Silverstein			

1)	Paper Title	Instrumentation, working, sample analysis and data interpretation (Lab. Training)
3)	Paper No	III
4)	Objectives of Paper	1. To educate students about theoretical aspects of instruments
		2. To train students with instrument handling
		3. To understand the use of sophisticated instruments
		4. To educate students of standardization & optimization of parameters

		5. To enable students in data interpretation.			
		6. To make students competent with analytical skills required for jobs in Chemical/pharmaceutical industries.			
		7. To make awareness about maintenance of instrument, cleanliness and Safety.			
		8. Enhance Research Interest among students.			
5)	Expected out comes from paper	1. Enhancement in quality with error minimization in sample testing			
		2. Skill development in instrument handling			
		3. Expertise in sample analysis & data interpretation			
		4. Skilled human resource generation			
		5. Generation of skilled manpower to cater the need of chemical & pharmaceutical industries			
6)	Contents	Unit-1.	Nuclear Magnetic Resonance Spectroscopy (NMR)	Hour	12
		Unit-2.	Infrared Spectroscopy (IR)	Hour	11
		Unit-3.	High-performance liquid chromatography (HPLC)	Hour	11
		Unit-4.	Gas chromatography– mass spectrometry (GCMS)	Hour	11
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