Rayat Shikshan Sanstha's

Karmaveer Bhaurao Patil College, Vashi

Department of Microbiology [2020-2021]

M.Sc. Part II

Advance instrumentation Training at SASMIRA, Warli

Sr. No	INSTRUMENT NAME	Topic Covered		TIME
		Theory	Practical	
1	**Scanning Electron Microscope with the coating techniques**	1. Instrument Know how 2. Importance of Sample Preparation for Analysis 3. Sputter Coating 4. SEM sample analysis Demonstration 5. Post Run Analysis	Hands on sample preparation and sputter coating	7 Hrs.
2	**HP-TLC**	1. Instrument know how 2. Sample application techniques 3. Post run analysis	Hands on HP-TLC analysis	7 Hrs.
3	**GC-MS**	1. Introduction to GC 2. Introduction FID/MS 3 Introduction to Signal Quadrupole GC-MS 4 Introduction to Triple Quadrupole Cord GC-MS 5 Post run analysis	Hands on gc-ms analysis for detection of amines/phthalates	4 + 3 Hrs
4	**Particle Size Analyzer**	1. Instrument Know how 2. Importance of Sample preparation	Hands on Sample Analysis	3 Hrs
5.	**Introduction to Quality Management System**	1. Introduction to ISO 17025 (QMS) 2. Calibration and its importance 3. Validation and its importance 4. Documentation and its importance	Lab visit	7 Hrs.

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[Two Batches: 27.01.2021 to 01.02.2021, 01.03.2021 to 05.03.2021]

REPORT

Students of **Karmaveer Bhaurao Patil College, Vashi** recently visited **The Synthetic and Art Silk Mill's Research Associations (SASMIRA),** a co-operative venture set up by man-made textile industry of India. This visit endured for a 5 day training program on **Advance instrumentation.** The course helped students enhance the knowledge about various theoretically known instruments, to understand its practicality, handling, maintenance and several factors as this training was also a hands on experience for students.

This training has definitely lead students achieve extreme importance and interest in field on instrumentation and was helpful considering future prospective. Below enlisted are the instruments studied and gained knowledge about in the training program at SASMIRA, Worli.

1) HP-TLC (High-performance thin-layer chromatography).

HPTLC (high-performance thin layer chromatography) is a sophisticated form of TLC, which provides superior separation efficiency. The HPTLC concept includes validated methods for qualitative and quantitative analysis, and fulfills all quality requirements for use in fully regulated environments.

Principle:"HPTLC have similar approach and employ the same physical principles of TLC (adsorption chromatography) i.e. the principle of separation is adsorption. ⑥ The mobile phase solvent flows through because of capillary action. The components move according to their affinities towards the adsorbent."

Applications:HPTLC is used for purity control of chemicals, pesticides, steroids, and water analysis. It is also widely used for analysis of vitamins, water-soluble food dyes, pesticides in fruits, vegetables, and other food stuffs.

We were given a hands on training of HP-TLC where we were given to prepare a plate, make markings on the plate, run the sample, use the scanner, handling the software, etc.

2) Scanning Electron Microscopy (SEM).

Scanning electron microscopy (SEM) is an analytical testing method that captures high resolution images of objects as small as 15 nano-meters with a focused beam of electrons.

Principle : A scanning electron microscope (SEM) scans a focused electron beam over a surface to create an image. The electrons in the beam interact with the sample, producing various signals that can be used to obtain information about the surface topography and composition.

Applications : Scanning Electron Microscopes (SEMs) are used across a number of industrial, commercial, and research applications. From cutting edge fabrication processes to forensic applications, there's a diverse range of practical applications for the modern SEM. The SEM is routinely used to generate high-resolution images of shapes of objects and to Identify phases based on qualitative chemical analysis and/or crystalline structure.

At SASMIRA we got hands on training on using the 'sputter coater' device which is used to produce a thin gold coat on the sample surface.

3) PSA (Particle Size Analyzer):

PSA is basically used to examine the particle distribution in the sample. It gives an overview about how much the particles are dispersed in the sample. This technique only uses laser light to investigate the distribution and gives size of the particle in the form of hydrodynamic diameter.

PRINCIPLE: It works on the principle of Brownian motion (particles vibrate and hit the neighbouring particles and get a hit by the neighbouring particles). It uses formula to calculate a diameter of one particular clump of particles which is as follows:

$$D_h = \frac{k_B T}{3\pi\eta D_t}$$

For further analysis correlation function is used:

$G(\tau) = B + A\Sigma e^{-2q^2 D\tau}$

APPLICATION:PSA is always preferred over SEM and TEM in industrial sectors. They use PSA to check the dispersion of the particles in the know

sample solution and that only can be accurately and easily measured by PSA than other two instruments. PSA is very useful in case of known samples. It only gives the size of clumps formed by particles present in the solution in the form of hydrodynamic diameter which makes it easy to proceed faster for known samples.

4) GC-MS Gas Chromatography–Mass Spectrometry:

Gas chromatography–mass spectrometry (GC-MS) is an analytical method that combines the features of gas-chromatography and mass spectrometry to identify different substances within a test sample.

PRINCIPLE: The GC works on the principle that a mixture will separate into individual substances when heated. The heated gases are carried through a column with an inert gas (such as helium). As the separated substances emerge from the column opening, they flow into the MS. Mass spectrometry identifies compounds by the mass of the analyte molecule.

APPLICATION: Applications of GC-MS include drug detection, fire investigation, environmental analysis, explosives investigation, and identification of unknown samples, including that of material samples obtained from planet Mars during probe missions as early as the 1970s. GC-MS is extensively used for the analysis of these compounds which include esters, fatty acids, alcohols, aldehydes, terpenes etc. It is also used to detect and measure contaminants from spoilage or adulteration which may be harmful and which is often controlled by governmental agencies, for example pesticides.

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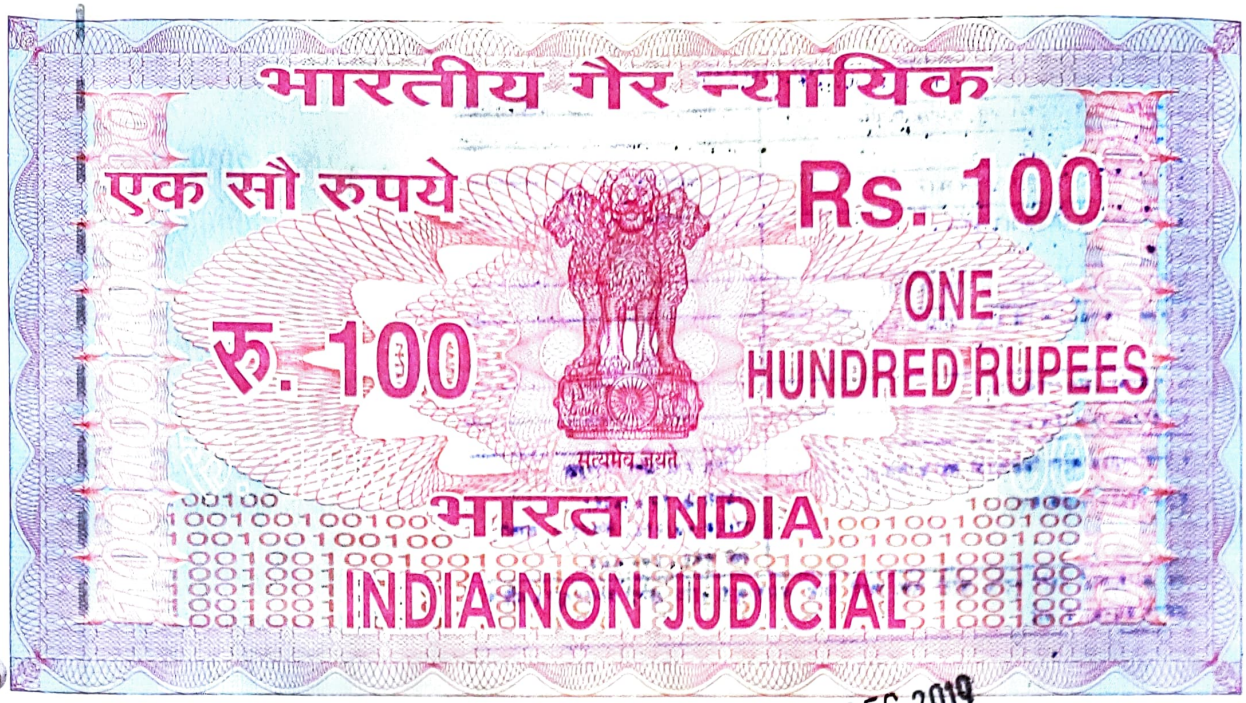

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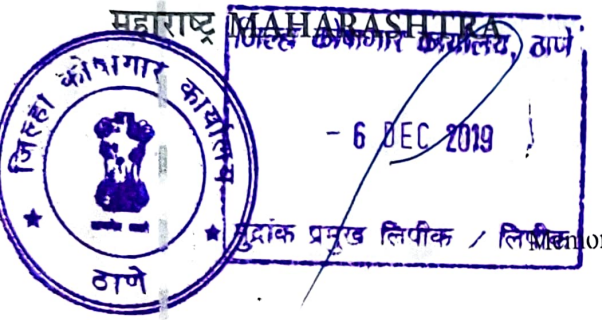

Memorandum of Understanding

Between

KARMAVEER BHAURAO PATIL COLLEGE, VASHI

AND

SASMIRA WORLI

This MOU is signed between:

The Synthetic and Art Silk Mills Research Association SASMIRA, SASMIRA Marg, Worli, Mumbai-400030, "Delivery Partner".

AND

Karmaveer Bhaurao Patil College, Vashi Sector 15 A, Vashi, Navi Mumbai Dist. Thane-400703, hereinafter known as the "Resource Partner", represented by

HOD of Microbiology Dept.: Dr Shubhada Nayak

Associate Professor& Co-Ordinator: Mr Sandesh Gharge

जोडपत्र-२/ Annexure-II

१. मुद्रांक विक्री नोंदवही अनु. क्रमांक/दिनांक	21820
२. दस्ताचा प्रकार	NA
३. दस्त नोंदणी करणार आहेत का?	होय / नाही
४. पिंट्रस्तीचे थोडक्यात वर्णन -	
५. मुद्रांक विक्रत घेणाऱ्याचे नांव व सही	
६. हस्ते अकलवारा त्यांचे नाव, पत्ता व सही	
७. दुकान मालकाचे नाव	
८. मुद्रांक मुल्य रक्कम	1087
९. परवानाधारक मुद्रांक विक्रेत्याची सही व परवाना क्रमांक तसेच मुद्रांक विक्रीचे ठिकाण/पत्ता	संजय रुक्मिंग जाधव परवाना क्र. १२०१०२९, एसएल-०४/२१८, सेक्टर-२, वाशी, नवी मुंबई - ४०० ७०३.

ज्या कारणासाठी जर्वांनी मुद्रांक खरेदी केला त्यांनी त्याच कारणासाठी मुद्रांक खरेदी केल्यापासून ६ महिन्यात वापरणे बंधनकारक आहे.

11 DEC 2019

11 DEC 2019

1. As per the agreement SASMIRA (Delivery Partner) herein confirms that it shall provide the necessary training on **Advanced Bioinstrumentation** course to the bona fide students of Karmaveer Bhaurao Patil College (Resource Partner) herein agreed that such teaching and training as aforesaid mentioned shall be provided only for the fulfillment of the criteria of minimum number of students as agreed by the two parties.
2. The Delivery Partner agrees to provide the entire necessary infrastructure required for the purpose ofTraining and teaching **Advanced Bioinstrumentation**. Such infrastructure shall include Laboratories, Instruments, Computers Internet facilities, projectors and any such aids appliances and equipment as required by the delivery partner for conducting the course.
3. This agreement must be signed only by the parties as detailed in clause 1.
4. The tenure of the contract would be from November 2019 to October 2020 subject to the fulfillment of the conditions of this agreement, by the Resource Partner and to the satisfaction of the Delivery Partner.
5. Resources Partner would allocate appropriate time slots as agreed by the two parties before or after the academic schedule for the training programs offered by the Delivery Partner.
6. Training Duration: The Period of the Training would be for the prescribed number of 30hrsminimum and there would be minimum 20 and maximum 25 students per batch.
7. Fees

Sr. no	Training Module	Total Duration	Fee be paid directly to (DP)	Total Students
1	**Advanced Bioinstrumentation**	30 hours	2,000/-per student	22 students

The Fees as Mentioned above is all inclusive.

All payments towards fees shall be made in the name of the "SASMIRA."

12. The fees as mentioned above are only for the specified period in the agreement. Provided that the two parties agree to review those fees every academic year as per the cost components prevailing during such time.
13. FACULITY DEVELOPMENT PROGRAM. The Delivery partner shall bundle free as Faculty Development Program for faculty members (Microbiology/Biotechnology/Bioanalytical) of the College/Resource Person. Such Faculty can attend the training session in any batch with student.
14. The certificates of completion of the Skill- Based Course titled **Advanced Bioinstrumentation** to the enrolled students will be issued on successful completion of the training & evaluation process by SASMIRA.
15. Delivery Partner may offer from time to time other professional training programs to the students or teachers based on industry requirements and as per the demand from the college/students.
16. A minimum lead time of 7-15 days will be required to start the training from the date of signing the MOU.

17. Once the agreement is signed & the registration process starts, college will have to release the purchase order for the same within two days of signing of the agreement.
18. In case of any dispute or differences whatsoever arising between the parties out of or relating to the construction, meaning, scope, operation or effect of this contract or the Validity or the breach there of shall be settled be arbitration in accordance with the Rules of Arbitration of the Indian Court of Arbitration and the award made in pursuance thereof shall be binding on the parties. "However the court of jurisdiction would be in Mumbai shall be binding on the parties.
19. For students those are irregular in the program trainings/ projects, no separate class (s)/trainingshall be conducted.
20. In case, if the student after getting himself/herself registered doesn't turn up for the training then the registration amount/fees for the same will not be refunded back.
21. Once the agreement is signed between Resource Partner & Delivery Partner, the same cannot be terminated for at least six months from the signing of agreement
22. The Resources Partner should verify all the details and fully satisfy them before entering in to the agreement as once the agreement is signed the same cannot be terminated before expiry of the same.

For THE SYNTHETIC & ART SILLK MILLS RESEARCH ASSOCIATION, Mumbai.
EXECUTIVE DIRECTOR

(Delivery Partner)

KBP College Vashi, Navi Mumbai

PRINCIPAL
KARMAVEER BHAURAO PATIL COLLEGE
VASHI, NAVI MUMBAI-400 703.

(Resource Partner)

Date : 3/10/2018

Place: Vashi

Witness 1

Witness 2 S.A. Ghange

Witness 3 Pramod Salunke.

RAYAT SHIKSHAN SANSTHA'S
KARMAVEER BHAURAO PATIL COLLEGE, VASHI
DEPARTMENT OF ECONOMICS
Skill Based Course - Advanced Instrumentation
Academic Year - 2020- 21
Enrollment List

Sr. No.	Students Name	Class	Email ID
1	POONAM SANJAY BHOSALE	MSC-II (MICRO)	poonambhosale9810@gmail.com
2	SHREYA SANJAY BHATTACHARYA	MSC-II (MICRO)	shreyabhattacharya29@gmail.com
3	POOJA RAOSAHEB DUSHMAN	MSC-II (MICRO)	poojadushman15@gmail.com
4	ANKITA SHEKHAR TALATHI	MSC-II (MICRO)	ankitatalathi18@gmail.com
5	SONAL SUNIL GUPTA	MSC-II (MICRO)	sonalg10021999@gmail.com
6	HEENA GHANSHYAM UMAT	MSC-II (MICRO)	heenagumat@gmail.com
7	ILMA NADEEM HASAN	MSC-II (MICRO)	ilmahasan2327@gmail.com
8	SIDDHI PRABHAKAR VICHARE	MSC-II (MICRO)	siddhivichare43@gmail.com
9	AISHA SALIM KHAN	MSC-II (MICRO)	kaisha0345@gmail.com
10	PUJA MAHADEV KOLEKAR	MSC-II (MICRO)	poojak271998@gmail.com
11	SATISH VINOD CHAVHAN	MSC-II (MICRO)	chavhansatish57@gmail.com
12	SWARANJALI SHANTARAM DHANE	MSC-II (MICRO)	swaranjalidhane26@gmail.com
13	AISHWARYA DEORAM KUTHE	MSC-II (MICRO)	aishwaryakuthe1998@gmail.com
14	SABIHA MATIURREHMAN SHAIKH	MSC-II (MICRO)	sabihasha2019@gmail.com
15	ROHIT SHAMRAO SAWANT	MSC-II (MICRO)	sawantr852@gmail.com
16	SIDDHI NITIN WAGHMARE	MSC-II (MICRO)	wsiddhi21@gmail.com
17	ANKITA MOHAN RAUT	MSC-II (MICRO)	anku88raut@gmail.com
18	SURBHI SANJAY JUVEKAR	MSC-II (MICRO)	surbhijuvekar@gmail.com
19	PRANALI BHASKAR BHOPATRAO	MSC-II (MICRO)	pranalibhopatrao1999@gmail.com
20	SHALINI SHAM SUTAR	MSC-II (MICRO)	shalinisutar5@gmail.com
21	SHIVANI MUKUND MAHADIK	MSC-II (MICRO)	shivanimahadik0306@gmail.com
22	SAGAR SUNIL SAKATE	MSC-II (MICRO)	sagarssakate@gmail.com
23	JIDNYASA RAVINDRA PATIL	MSC-II (MICRO)	jidnyasarpatil@gmail.com

sasmira

The Synthetic & Art Silk Mills' Research Association,

(Approved body of Ministry of Textiles, Govt. of India)

CERTIFICATE OF TRAINING

This is to certify that ***Surbhi Juvekar,***

studying in MSc Part II (Microbiology) of Karmaveer Bhaurao Patil College, Vashi has completed five day (30 Hrs) Training program on 'Advanced Instrumentation' organized from 1st - 5th March 2021.

Date: 8th July 2021

Dr. Manisha Mathur
Joint Director &
Quality Manager