



**Swarnnim Start-up and Innovation University, Gandhinagar**

**Aarihant Ayurvedic Medical College and Research Institute**

**VALUE ADDED COURSE(2021-22)**

**Department of Rasashastra & Bhaishajyakalpana**

**Course name** – Practical Training on Manufacturing Instruments used in Ayurveda Pharmaceuticals and QC lab

**Organizing Department** –Department of Rasashastra and Bhaishajyakalpana

**Course code** – RSPTQC1

**Course co-ordinators** – Dr. Priyadarshini Nambiar & Dr. Namdev Vanganekar

**Duration** – 30 hours

**Date** – 9<sup>th</sup> March to 27<sup>th</sup> April 2021

**Preamble**

Numbers of Instruments Used in Ayurveda Pharmaceuticals and Quality Control Labs. This course is designed to provide an in-depth understanding of the essential instruments and technologies used in the preparation, analysis, and quality control of Ayurvedic medicines. You will explore both traditional and modern equipment, learning their applications, operation, and significance in ensuring the efficacy, safety, and quality of Ayurvedic products. By the end of this course, you'll gain practical insights into the integration of advanced instrumentation with traditional Ayurvedic practices, enhancing your expertise in this specialized field.

**Aims**

- **Comprehensive Understanding:** To provide an in-depth understanding of the principles, operation, and application of essential pharmaceutical manufacturing instruments.
- **Practical Skills:** To develop hands-on skills in operating and troubleshooting various pharmaceutical manufacturing instruments.
- **Quality Assurance:** To emphasize the role of these instruments in maintaining quality and compliance within pharmaceutical manufacturing processes.

## Objectives

- Tablet Punching Machine – Describe the working principles and types of tablet punching machines, set up and operate a tablet punching machine and Troubleshoot common issues encountered during tablet compression.
- Tray Dryer – Explain the principles and design of tray dryers, operate a tray dryer efficiently for drying pharmaceutical products and analyze the effectiveness of drying processes.
- Mass Mixer – Understand the principles of mass mixing and the importance in pharmaceutical manufacturing, operate a mass mixer for blending powders and other substances and evaluate the consistency and uniformity of the mixed mass.
- Liquid Filling Machine - Describe the types and principles of liquid filling machines, set up, calibrate, and operate a liquid filling machine for accurate filling and ensure proper handling and maintenance of the filling machine.
- Pulverizer - Explain the process and types of pulverization in pharmaceutical manufacturing, operate a pulverizer for size reduction of pharmaceutical powders and analyze the particle size distribution of the pulverized material.
- Multi Mill - Understand the principles of multi-milling and its application in pharmaceutical processing. set up and operate a multi mill for size reduction and granulation and assess the efficiency of milling processes.
- Vibro Shifter - Describe the function and design of vibro shifters, operate a vibro shifter for separating and classifying particles and troubleshoot and maintain the vibro shifter.
- Dissolution Apparatus - Explain the principles and types of dissolution testing apparatus, conduct dissolution tests to assess drug release rates and interpret dissolution data to evaluate the quality of pharmaceutical products.
- Tablet Hardness Tester - Understand the principles and types of tablet hardness testers, measure and analyze the hardness of tablets and ensure tablet quality and consistency.
- Disintegration Apparatus - Describe the principles and operation of disintegration apparatus, perform disintegration tests to ensure tablet performance and analyze and interpret disintegration data for product quality assurance.

## Program Outcomes:

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

- Expertise in Instrumentation: Demonstrate a thorough understanding of various pharmaceutical manufacturing instruments and their roles in the manufacturing process.
- Operational Proficiency: Exhibit proficiency in setting up, operating, and maintaining pharmaceutical manufacturing instruments.
- Quality Assurance: Apply knowledge to ensure compliance with industry standards and quality control measures.

- Problem-Solving Skills: Identify and resolve operational issues related to pharmaceutical instruments effectively.
- Data Interpretation: Accurately analyze and interpret data obtained from various instruments to ensure product quality and regulatory compliance.

**Course Outcomes:**

By the end of the course, participants will be able to:

- Tablet Punching Machine: Operate a tablet punching machine and troubleshoot common issues, ensuring efficient tablet compression.
- Tray Dryer: Utilize a tray dryer for effective drying processes and assess its performance.
- Mass Mixer: Blend pharmaceutical powders using a mass mixer, ensuring uniformity and consistency.
- Liquid Filling Machine: Perform accurate liquid filling and calibration using a liquid filling machine.
- Pulverizer: Operate a pulverizer for size reduction and analyze the particle size distribution.
- Multi Mill: Conduct size reduction and granulation processes using a multi mill effectively.
- Vibro Shifter: Use a vibro shifter to separate and classify particles, and maintain its operational efficiency.
- Dissolution Apparatus: Execute dissolution tests, interpret results, and evaluate the quality of pharmaceutical products.
- Tablet Hardness Tester: Measure and assess tablet hardness to ensure product consistency.
- Disintegration Apparatus: Conduct disintegration tests and analyze data to verify tablet performance and quality.

## Content of the course

Sr. No.	Module	Duration
1.	<ul style="list-style-type: none"> <li>➤ Introduction to Manufacturing Instruments in Ayurveda Pharmaceuticals and QC Lab</li> <li>➤ Overview of the importance of manufacturing instruments in Ayurveda pharmaceuticals and QC lab</li> <li>➤ Regulatory considerations and quality control</li> </ul>	2 hour
2.	<ul style="list-style-type: none"> <li>➤ Tablet Punching Machine – Principles and Types</li> <li>➤ Tablet Punching Machine – Operation and Set up</li> <li>➤ Tablet Punching Machine – Hands on training : Operation and troubleshooting</li> </ul>	3 hours
3.	<ul style="list-style-type: none"> <li>➤ Tray Dryer – Fundamentals of Tray drying</li> <li>➤ Tray Dryer – Design and Operation</li> <li>➤ Tray Dryer – Hands on training : Using the tray dryer</li> </ul>	3 hours
4.	<ul style="list-style-type: none"> <li>➤ Mass Mixer - Principles of mass mixing</li> <li>➤ Mass Mixer - Components and operation</li> <li>➤ Mass Mixer - Hands-on practice: Mixing and analyzing</li> </ul>	3 hours
5.	<ul style="list-style-type: none"> <li>➤ Liquid Filling Machine - Types and principles</li> <li>➤ Liquid Filling Machine - Setup and operation</li> <li>➤ Liquid Filling Machine - Hands-on practice: Filling and calibration</li> </ul>	3 hours
6.	<ul style="list-style-type: none"> <li>➤ Pulverizer – Overview of pulverization</li> <li>➤ Pulverizer - Types and applications</li> <li>➤ Pulverizer - Hands-on practice: Operating and analyzing particle size</li> </ul>	3 hours
7.	<ul style="list-style-type: none"> <li>➤ Multi Mill – Principles of multi-milling</li> <li>➤ Multi Mill – Equipment setup and operation</li> <li>➤ Multi Mill - Hands-on practice: Milling and sample analysis</li> </ul>	3 hours
8.	<ul style="list-style-type: none"> <li>➤ Vibro Shifter – Function and design</li> <li>➤ Vibro Shifter – Operation and maintenance</li> <li>➤ Vibro Shifter - Hands-on practice: Shifting and separating</li> </ul>	3 hours
9.	<ul style="list-style-type: none"> <li>➤ Dissolution Apparatus - Principles and types</li> <li>➤ Dissolution Apparatus - Setup and testing</li> <li>➤ Dissolution Apparatus - Hands-on practice: Conducting tests and interpreting data</li> </ul>	3 hours
10.	<ul style="list-style-type: none"> <li>➤ Tablet Hardness Tester - Principles and types</li> </ul>	2 hours

	<ul style="list-style-type: none"> <li>➤ Tablet Hardness Tester - Operation and calibration</li> <li>➤ Tablet Hardness Tester - Hands-on practice: Measuring tablet hardness</li> </ul>	
11.	<ul style="list-style-type: none"> <li>➤ Disintegration Apparatus - Principles and types</li> <li>➤ Disintegration Apparatus - Setup and use</li> <li>➤ Disintegration Apparatus - Hands-on practice: Performing disintegration tests</li> </ul>	2 hours
	<b>Total hours</b>	<b>30 Hours</b>

- **Teaching aids**

Didactic Lectures, AV class, Demonstration & Hands on training.

- **Assessment criteria**

Assessed for Knowledge, Skills, Attitude, Written Activity, Comprehension, and Questionnaire.

- **EligibilityCriteria**

Medical Students –UG, PG students of BAMS



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