

# LYOPHILIZATION TECHNOLOGY: PRODUCT, PROCESS AND SYSTEMS

14-16 OCTOBER, 2025  
LOWELL (MA), USA



## Course overview

This course provides an opportunity to explore various elements in the lyophilization process. From the characterization of products to cycle development and scale-up, we cover the science and engineering of lyophilization.

Hosted at the top University of Massachusetts (UMass) Lowell, our training includes multiple sessions discussing theoretical aspects of freeze drying and practical workshops during which participants will use this knowledge to answer real-life freeze drying questions.

## Suitable for industries including:

- ✓ Pharma R&D to Production
- ✓ Diagnostics
- ✓ Lyo Processing & Production
- ✓ Biotechnology

## What is covered in the price?



Over 18h of lyophilization content



Printed learning materials (full lectures notes)



Lunch & Refreshments



UMass Lowell facility tour



## Course schedule

### Day 1: Introduction to Lyophilization Technology



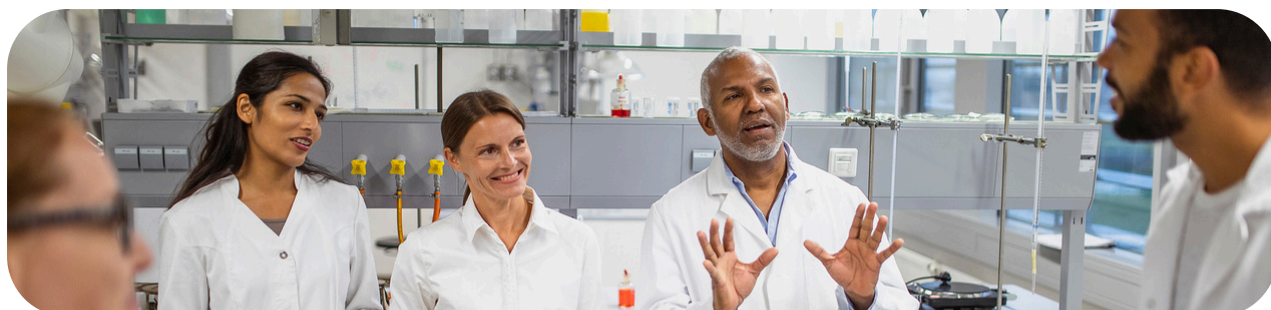
Start with the fundamentals of lyophilization, exploring process principles, freezing techniques, and drying stages. Learn about refrigeration, stoppering systems, formulation strategies, and the role of process condensers, providing a solid foundation in both theory and practical system design.

### Day 2: Cycle Development & Process Monitoring



Discover formulation characterization, vacuum systems, and strategies for lyophilizing cycle development and scale-up. Learn about process monitoring using PAT and advanced tools, explore software-based QbD approaches, and participate in a workshop evaluating lyophile appearance to apply theoretical knowledge practically.

### Day 3: Advanced Product Analysis & Maintenance



Focus on product analysis techniques, including moisture content, thermal, and structural evaluations. Learn about container and closure technologies, cleaning and sterilization systems, and maintenance strategies. End with a hands-on workshop, designing a lyophilizer and solving multidisciplinary lyophilization challenges.

**\*\*Course agenda available upon request\*\***

## About our instructors



### Dr. Bhaskar Pandya

Bhaskar joined Biopharma Group in 2021 as a Senior Scientist after earning a PhD on single-vial freeze drying monitoring using vial impedance spectroscopy (TVIS) at De Montfort University, UK. At Biopharma's Winchester lab, Bhaskar manages collaborative pharma and diagnostics projects and provides consultancy for new and existing products. He also holds a Master's by Research (MRes) from University College London, enhancing his expertise in the field.



### Andrew Ray

Andrew has worked for Biopharma Group since 2017 in the Engineering Department, becoming Technical Service Manager in 2024. For the first 3 years the focus of his work was on the service and repair of the ATS Scientific Products range of freeze driers. More recently he has developed his role into equipment installation & validation and analytical instruments, and becoming the Engineering Trainer.

## Registration

Use our online form to register for this training courses. We will contact you to confirm payment details, number of attendees and course choice.

Please note that multiple bookings from the same organization can qualify for a discount, contact us for more details.

**BOOK YOUR SPOT**



## Accomodation

Please note that the cost of accommodation is not included in the course fee and that bedroom bookings must be made by the participants. A list of local hotels will be provided with the registration confirmation.

**Cost: \$3,570**

Early Bird Rate: \$3,035  
(deadline August 29th, 2025)

## Contact us

Email: [contact@btllc.solutions](mailto:contact@btllc.solutions) or  
[education@biopharma.co.uk](mailto:education@biopharma.co.uk)  
Telephone: +1 (858) 769-5334  
Website: [btllc.solutions.com](http://btllc.solutions.com)