



# NIBRT Digitalisation Training



## Unlocking Digital Excellence in Biopharma Manufacturing

Empower your team with cutting-edge digital manufacturing strategies through NIBRT's digitalisation training. Our comprehensive training offerings include workshops in collaboration with Boston Consulting Group (BCG), short courses and custom courses. Each training option is designed to meet the evolving demands of industry, ensuring you stay at the forefront of digital innovation.

### Why NIBRT?

- NIBRT provides real-world experience to trainees at our state-of-the-art simulated GxP facility
- A dynamic learning experience with a mix of theory and practical elements, focused on biopharma relevant data
- Latest software and computers provided
- Small class sizes designed to maximise interaction among attendees

## Strategic Workshops in Partnership with Boston Consulting Group (BCG)

### Tailored for Senior Leaders

Our custom workshops, delivered jointly by NIBRT and BCG, are specifically designed for senior leaders aiming to refine and optimise their digital manufacturing strategies.

Located at NIBRT, the Innovation Centre of Operations (ICO) serves as a dynamic testbed for a diverse array of Industry 4.0 technologies and their application to use cases in biopharma manufacturing. Workshops are customised to meet a client's particular requirements but would typically include current trends in digital transformation, case studies, assessment of 4.0 technologies (such as mixed reality and data analytics) which have been deployed in the ICO.

Contact [training@nibr.t.ie](mailto:training@nibr.t.ie) for more information on BCG workshops.

## Short Courses

NIBRT's short courses deliver focused, expert-led training for quick proficiency in digitalisation within biopharma manufacturing. These modules provide a comprehensive understanding of key concepts, current trends and practical applications that equip participants with the essential knowledge needed to navigate the dynamic landscape of biopharma manufacturing in the digital age.

Up-to-date schedules and online booking via NIBRT.ie website:

[www.nibr.t.ie/training-and-education/training-courses/](http://www.nibr.t.ie/training-and-education/training-courses/)

# In-Person Courses

## 1. Introduction to Data Analytics

A two-day course focused on the application of basic statistics and visualisation. Suitable for trainees with no or limited mathematical/statistical background, including manufacturing specialists, lab staff, process scientists and IT professionals.

	Morning	Afternoon
Day 1	Introduction to Statistics	Probability and Distributions
Day 2	Data Visualisation, Outlier Detection and Inferential Statistics	Practical Session with Power BI

### Testimonials

*Instructor was excellent, very engaging - using relevant real-life examples to explain statistics and where it can be used.*



## 2. Advanced Data Analytics

A three-day course designed to build on the Introductory course. Suitable for trainees with good basic statistical knowledge, including process and quality control scientists.

	Morning	Afternoon
Day 1	Reproducibility in data science Linear and non-linear regression, combining process knowledge with statistical modelling	Case studies: Stability testing and cell culture
Day 2	Design of Experiment (DoE) Benefits over one-factor-at-a-time (OFAT) experiments	Case study: Designing cell culture experiments for optimal yield
Day 3	Statistical Process Control (SPC): Control charts and process capability	Case study: Trending of manufacturing data

### Testimonials

*Very clear instructions and explanations. Highly engaging. Real world practical examples.*

*Nice pace walking through the examples and ensuring everyone contributed to the explanations.*

*I'm glad I made time to attend. I learnt new things.*

*Enjoyed very much the 3 days of the course and the open discussions with the course teacher and other students in the group.*



## 3. Masterclass in Machine Learning **NEW**

This course builds on the Advanced Data Analytics course by incorporating low-code, Python-based advanced statistical techniques, including multivariate regression, time series analysis, image classification, natural language processing, and generative AI.

	Morning	Afternoon
Day 1	Introduction to Python, linear regression and tree-based methods, low-code machine learning	Case study: Multivariate analysis of yield optimisation
Day 2	Time series analysis with functional principal component Deep learning for image classification with TensorFlow/Keras	Case studies: Functional principal component analysis with cell culture data, automated visual inspection
Day 3	Natural language (text) processing and generative AI using pre-trained models	Case study: Text generation for quality reports

## 4. Introduction to Digitalisation

This one-day course is crafted to offer non-experts a journey into the transformative world of digitalisation principles, shedding light on the key concepts, tools, and future trends that are revolutionising the sector. This course has been designed for people managers who are new to digitalisation concepts. This session could also be run as part of an Introduction to Bioprocessing course for affiliated roles, such as lab informatics.

	Morning	Afternoon
Day 1	Electronic Batch Record and eForms: Definition and overview for an efficient implementation Overview of data analytics: An introduction to different algorithms and use cases that can be implemented within trainees' organisations.	Future trends in biopharma digitalisation Hands-on practical with extended reality technologies.

### Testimonials

*I work in IT and this module was highly relevant.*

*Would like to have more sessions with NIBRT trainers.*

*Trainers were clearly knowledgeable and answered every question asked.*



## Online Courses **NEW**

Up-to-date schedules and online booking via NIBRT.ie website:

[www.nibrt.ie/training-and-education/training-courses/](http://www.nibrt.ie/training-and-education/training-courses/)

### 1. Power BI

As organisations grow, consolidation of data sources will be key to enabling citizen analytics. Simply relying on Excel files will not be sufficient. In this one-day interactive course, trainees will be exposed to the features of Microsoft Power BI. Whether you are a process scientist or a human resources manager, this course will empower you to move from static Excel files to more responsive and collaborative visuals.

	Morning	Afternoon
Day 1	Introduction to data visualisation and storytelling Using the appropriate tools: Statistical packages vs. visualisation tools (Power BI and Plotly)	Analysing data from offline and online open-access sources (XML, JSON, REST API and Excel) Data modelling Data collaboration

### 2. Design of Experiment (DoE)

Experimentation in the laboratory can be time-consuming and costly. To ensure experiments are conducted in a statistically efficient way, the Design of Experiments principles must be applied. This will also help in demonstrating process understanding to regulators.

	Morning	Afternoon
Day 1	Introduction to DoE Comparison of DoE, mechanistic modelling and one factor at a time (OFAT) experiments	Practical session with a statistical package: designing a DoE experiment and predictive model building

# Customised Digitalisation Courses

At NIBRT, we understand that every organisation has unique digitalisation needs. That is why we offer customised courses tailored to meet the specific requirements of our clients. Whether you are looking to enhance your team's proficiency in specific digitalisation strategies or address industry-specific challenges, our expert instructors will collaborate with you to design and deliver bespoke training solutions.

## Custom Course Case Study

Client: A top 10 Irish pharmaceutical company.

In this case study, a customised one-day programme was designed to enable process scientists to gain an understanding of advanced statistical techniques, such as statistical process control and regression analysis. Given the complexity of bioprocessing, investigations typically consider multiple process parameters, which need to be refined using both process and statistical knowledge, such that the most probable root cause can be identified. In this course, the three-day Advanced Data Analytics course was compressed into a one-day intensive session. The NIBRT team was able to achieve this through a detailed content building exercise where the needs of the team were fully considered.

## Feedback



*Content tailored very well to suit our group*



*Lecture was in depth and covered a lot more than expected. Practical sessions helped solidify the understanding*



*Enjoyed the training and broadened my understanding. Thanks to the practicals I have learned things that will benefit me in my current job*



*Accommodated our groups interests very well*



*Jasp software very user friendly. Practical well explained. Good explanation of statistical indices generated*

## Digitalisation Technologies at NIBRT

- Mixed reality (MR): Microsoft HoloLens, Dynamics 365 Remote Assist and Guides coupled with performance analytics (Power BI)
- Virtual Reality training with Oculus headsets
- SmartSkin: Process analytical technology for fill-finish
- SmartReg: Voice-controlled electronic batch record
- Nymi: GDPR-compliant biometric (password-less) authentication
- Real-time video analysis for operator performance (TensorFlow)
- RFID Sample Identification



## Contact details

Book a course directly via [www.nibrt.ie/training-and-education/training-courses/](http://www.nibrt.ie/training-and-education/training-courses/)

Email training team at [training@nibrt.ie](mailto:training@nibrt.ie) | Call training team at +353 1 215 8100