UTM
UNIVERSITI TEKNOLOGI MALAYSIA
Institute of Bioproduct Development

A 3 Day Course on

BIOREACTORS OPERATION, MAINTENANCE AND TROUBLESHOOTING

20 - 22 MAY 2019 | Jasmine Room, N22, IBD UTM

course introduction

This course is addressed to people who have already operating or planning to operate bioreactors. Their background can be one of a microbiologist, chemist, veterinarian, medical personnel or engineer. Technicians and supervisors with adequate and relevant working experience can also attend this course which will be divided into theoretical and practical sessions.

In theoretical sessions, the general setup and the technical details of a bioreactor and related equipment are presented. The sterilization procedures of the equipment are shown. Bioprocesses such as batch, fed-batch, continuous and perfusion cultivation are explained and the advantages/disadvantages of corresponding equipment are discussed. The dynamic behavior of such processes will be mathematically modified and calculated. In practical sessions, a strain is cultivated in a 16 litre in-situ sterilizable bioreactor. All operating steps such as sterilization, precultured, fed-batch cultivation, harvesting, cleaning and maintenance are performed. All participants will have the opportunity to operate a 16 litre bioreactor and will also be able to observe the operations of 150 litre and 1500 litre bioreactors and various downstream processing equipment (membrane and sterile filters, self discharge centrifuge, spray and freeze driers, homogenizers).

course objectives

The course aims to:

- To understand the main characteristics and differences between the different types of biofactories used in bioprocess industries.
- To provide knowledge in setting platform structure for bioprocess industry from laboratory to large scale manufacturing.
- To give broad overview on topics that governs both science and technology in bioprocess research and industries.
- To provide technical and professional information required to start-up and establish this type of industries.

course content

1. General setup of bioreactors
1.1 Submerse cultures. How to reach homogenous conditions?
1.2 Mechanical seal / magnetic coupling
1.3 Aeration / gas mixing station / exhaust gas treatment
1.4 pH control
1.5 Anti-foam control
1.6 p02 control
1.6.1 Mass transfer co-efficient kLa
1.6.2 Solubility of 02 / Air Saturation / Measurement of dissolved 02
1.6.3 Oxygen Transfer Rate (OTR)
1.6.4 Possibilities to control the p02 by increasing the OTR
1.7 Pressure Control
1.8 Mass Flow Control
1.9 Other Measurement and Control Loops

2. Sterilisation of the Equipment
2.1 Why sterilising?
2.2 How can it be sterilised?
2.3 Sterilisation of vessels, standard operating procedures
2.4 Sterilisation of transfer lines, principles of construction
2.5 Sterilisation by filtration
2.6 Details in the design of sterilisable equipment

Bioprocesses : description, equipment& simulation
3.1 Batch cultivation
3.2 Fed-batch cultivation
3.3 Continuous cultivation
3.4 Perfusion cultivation
3.5 Dialysis cultivation
3.6 Scale up of bioprocesses

4. Downstream Processing
4.1 Membrane and sterile filters
4.2 Self discharge centrifuge
4.3 Spray and freeze driers
4.4 Homogenizer

5. Hands-on Practical Sessions
5.1 Preculture
5.2 Calibration of the pH and p02sensor
5.3 Sterilisation of the equipment
5.4 Inoculation
5.5 Sampling, off-line analysis
5.6 p02 cascade control via stirrerspeed and air flow
5.7 Feed batch cultivation
5.8 Harvesting
5.9 Cleaning and maintenance of equipment
5.10 Downstream processing equipment
Demonstration :
- Self Discharge Centrifuge
- Homogenizer
- Spray Drier
- Freeze Drier

www.ibd.utm.my

enquiries

INSTITUTE OF BIOPRODUCT DEVELOPMENT, UNIVERSITI TEKNOLOGI MALAYSIA
81310 UTM Johor Bahru, Johor
tel : **+607.553 1559** Attn : Asmafarhana email : asmafarhana@ibd.utm.my
Jalan Sultan Yahya Petra, 54100 Kuala Lumpur
tel : **+603.2615 4406** Attn : Yatie email : nikyati@ibd.utm.my

Register NOW!

M2 : A 3 Day Course on Bioreactors Operation, Maintenance and Troubleshooting

20 - 22 May 2019 | Jasmine Room, N22 IBD UTM Johor

YES! I would like to register the following participants

Name 1

Job Title

Name 2

Job Title

COMPANY INFORMATION

Company

Address

Town

State

Tel Fax

Email

Authorised Signatory (*This registration is invalid without signature from an authorised officer)

Name

Job Title

Tel Fax

Email

course fee

Fee is inclusive of lunch, refreshments and course materials.

Accommodation is not included.

Normal Fee
RM **1,500**

Student Fee
RM **1,000**

Method of Payment

Please kindly complete and return the reply form together with :

By cheque / Bank Draft which are made payable to **BENDAHARI UTM**

Payment direct to account

Account name	**Bendahari UTM**
Bank	**CIMB Bank Berhad**
Account No	**8006053536**

Cancellation & Substitutions

A full refund will be promptly made for all written cancellations 2 weeks before the course. 50% refund will be made for written cancellations received 7 days before the course. A substitute may be made at any time.

Note

A) The organiser has the right to make any amendments that they deem to be in the best interest of the course and to cancel the course if insufficient registrations are received a week before course commencements date.

B) CERTIFICATE OF ATTENDANCE will be awarded at the end of the course.

course tutors

PROF. DR. RER. NAT. HESHAM A. EL ENSHASY | Prof. Dr. rer. Nat. Hesham A. El Ensashy is currently a Professor at IBD. He holds a PhD. in Industrial Biotechnology from TU Braunschweig, Germany and helds various postdoctoral positions at Ohio State Univ. and Germany Research Centre for Biotechnology (GBF), which now has changed its name to Helmholts Centre for Infection Research. He established different research and industrial platforms for the production of biopharmaceutically important compounds using microbial and non-microbial cells. He also organized different training courses on operation and maintenance of biotechnology equipment both for upstream and downstream applications. Dr. El Enshasy is also working as consultant for biobusiness, technology transfer and biotech. facility design/auditing for many biopharmaceutical companies in Egypt, Belgium, Greece, USA, China and Malaysia.

DR DANIEL JOE DAILIN | Dr. Daniel is currently a senior lecturer for Bioprocess and Polymer Engineering, School of Chemical and Energy Engineering, Universiti Teknologi Malaysia. Before joining UTM, he works as a principal scientist in the RND department for Biocon Sdn Bhd, Asia's largest integrated insulins manufacturing facility at the Biotech Park in Johor, Malaysia. He also previously worked as a research scientist under the Centre for Biofuel and Biochemical Research (CBBR), Universiti Teknologi PETRONAS in Perak, Malaysia. He received his Ph.D. in Bioprocess Engineering from Universiti Teknologi Malaysia. Dr. Daniel has more than 8 years of experience working in the operation and process scale up for bioprocess fermentation of bacteria and yeast platform; perform technology transfer activities; planning, carrying out and supervising process trials in laboratories, pilot plants and manufacturing plant.

DR. MUHD NAZRUL HISHAM ZAINAL ALAM is currently holding a senior lecturer position in School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia. He completed his PhD study in Chemical Engineering Denmark Technical University (DTU) in 2011 and worked as a Post-Doctoral fellow in School of Engineering, Deakin University, Australia between May 2013 and February 2017. Since his appointment as a lecturer in 2005, he has taught over 50 hours of undergraduate courses, supervised various biotechnology research projects and involved in numbers of manufacturing contract projects involving the production of specific protein from E.coli and fungi. His research interest is mainly on bioreactor design, fermentation technology, miniaturization and process automation.

MS. ROSLINDA ABD MALEK (Senior Research Officer) | She is a graduate from Universiti Teknologi Malaysia in Bachelor of Science (Biology Industry), Malaysia. She received her Master of Science (Biotechnology) in year 2009 and working in IBD for 16 years as Research Officer in Bioprocessing, Fermentation Technology, Microbiology, Microbiology analysis and Biotechnology area. She has an interest in upstream part include scale up study bioreactor from 16L to 1500L, medium optimization, isolation several types of bacteria and basic microbiology fermentation and technology. Furthermore she successfully developed several industrial platforms for bacteria, yeast and mushroom cell cultivation for different industries. She has involved with many contract research and production of microbe from local and international company at IBD

MR. SOLLEH BIN RAMLI (Research Officer) | Mr Solleh is a research officer in Institute of Bioproduct Development (IBD) at Universiti Teknologi Malaysia (UTM). He graduated from Universiti Putra Malaysia (UPM) in Bachelor of Science (Biotechnology) in 2004. After that he takes an industry skill enhancement program of herbal plantation & processing technology course at AdvancedTM Manufacturing Institute (AMI). His research interests are in Fermentation and Bioprocessing Technology. He is person in charge to operate and handling Bioreactor 16L, 150L and 1500L for research and production of microorganisms in IBD since 2006. He specializes in scaling up process for bioreactor and downstream processing. He has involved with many contract research and production of microbe from local and international company at IBD.