



PROGRAMME

Sunday 19th September: Day 1

- 12:00 Arrival/Registration
16:45 – 17:00 Welcoming Addresses
M. Berovič, Vesna Zechner-Krpan and A.W.Nienow

Course Introduction: Some Basic Concepts

- 17:00 – 17:45 Lecture 1; Basic Microbiological Concepts T. van Maris
17:45 – 18:30 Lecture 2; Basic Engineering Balances J. Büchs
18:30 – 19:15 Lecture 3; Introduction to Modern Industrial Bioprocesses M. Jenzsch
H.J.Noorman

19:45 Dinner and Welcome Party

Monday 20th September; Day 2

Stoichiometry, Rates and Reaction Kinetics

- 09:00 – 09:45 Lecture 4; Stoichiometry H.J.Noorman
09:45 – 10:30 Lecture 5; Kinetics H.J.Noorman
10:30 – 11:00 Coffee break

Physical Parameters of Bioreactors and Bioprocessing

- 11:00 – 11:45 Lecture 6; Rheology, Mass and Heat Transfer S.M. Stocks
11:45 – 12:30 Lecture 7; Stirred Bioreactors A.W. Nienow
12:30 – 14:00 Lunch
14:00 – 14:45 Lecture 8; Bioreactor Alternatives to Stirred Tanks A. Lübbert
14:45 – 15:30 Lecture 9; Scale-Up and Scale-Down S.M. Stocks
15:30 – 16:00 Coffee break
16:00 – 18:45 Exercise 1; Design Study 1, Stoichiometry/Kinetics H.J.Noorman
S.M. Stocks
T. van Maris
J. Büchs
19:00 – 20:00 Dinner
20:30 Get Together Party with Tasting of Participants 'National Delights'
M. Jenzsch, V. Zechner- Krpan, A. Slavica



Tuesday 21st September; Day 3

Bioreactors and Bioprocessing

09:00 – 09:45 Lecture 10; Bioprocess Engineering in Shake Flasks and Microwells J. Büchs

09:45 – 10:30 Lecture 11; Solid State Bioprocessing M. Berovič

10:30 – 11:00 Coffee break

11:00 – 11:45 Lecture 12; Fed Batch and Continuous Culture J. Büchs

Biological Parameters for Bioprocessing

11:45 – 12:30 Lecture 13; Laboratory strain evolution T. van Maris

12:30 – 14:00 Lunch

14:00 – 14:45 Lecture 14; Metabolic engineering towards anaerobic processes T. van Maris

14:45 – 17:30 Exercise 2; Design study 2/cultivation techniques
J. Büchs
H.J.Noorman
S.M. Stocks
T. van Maris

19:00 – 20:00 Dinner

20:30 *Chris Hewitt Speakers Corner*

M. Jenzsch, V. Zechner-Krpan, A. Slavica

Wednesday 22nd September; Day 4

Dynamic Diagnostic Analysis and Modelling

09:00 – 09:45 Lecture 15; Tools for In-vivo Diagnosis of Pathway Reactions M. Reuss

09:45 – 10:30 Lecture 16; Dynamic Modeling of Metabolism M. Reuss

Use of Enzymes

11:00 – 11:45 Lecture 17; Biocatalytic process engineering J.M. Woodley

12:00 **Social Trip**



Thursday 23rd September; Day 5

Modern Measurement Techniques and Optimisation

09:00 – 09:45 Lecture 18; Modern Measurements for Diagnostics and Control S.M. Stocks

09:45 – 10:30 Lecture 19; Process Optimisation M. Jenzsch

10:30 – 11:00 Coffee break

Special Cases 1 and 2

11:00 – 11:45 Lecture 20; Bioreactor Engineering for Large Scale Cell Culture A.W. Nienow

11:45 – 12:30 Lecture 21; Recombinant Protein Production with Different Hosts M. Jenzsch

12:30 – 14:00 Lunch

Downstream Processing

14:00 – 14:45 Lecture 22 Downstream Processing 1 L. van der Wielen

14:45 – 15:30 Lecture 23 Downstream Processing 2 L. van der Wielen

15:30 – 16:00 Coffee break

16:00 – 16:45 Lecture 24 Downstream Processing 3 L. van der Wielen

16:45 – 18:45 Exercise 3 Case study - Downstream Processing L. van der Wielen

19:00 – 19:45 Dinner

19:45 Wine Culture and Art of Wine Tasting in Europe M. Berovič

Friday 24th September; Day 6

Special Cases 3 and 4

09:00 – 09:45 Lecture 25; Bulk Chemical Production using Biocatalysis J.M. Woodley

09:45 – 10:30 Lecture 26; Bioprocess Engineering for Advanced Therapy
Medical Products Q. A. Rafiq

10:30 – 11:00 Coffee break

Control of Bioprocesses

11:00 – 11:45 Lecture 27; Introduction to Control of Bioprocesses J. K. Huusom

11:45 – 12:30 Lecture 28; Advances in Control of Bioprocesses J. K. Huusom

12:30 – 14:00 Lunch

14:00 – 18:45 Free time

18:30 – 20:00 Dinner

20:15 Farewell Party and Presentation of Certificates and Case Study Prize

Saturday 25th September; Departure