VLAG GRADUATE SCHOOL

COURSE

Microalgae Process Design: from cells to photobioreactors

4 – 11 July 2025

Wageningen Campus, the Netherlands

BACKGROUND

In this course both biological aspects of microalgae growth, and engineering aspects related to large-scale production processes will be covered. Special emphasis is given to light-limited growth and how this affects reactor design and operation. This aspect will also be treated in a hands-on experiment in small bench-scale photobioreactors. Furthermore, gas-liquid transfer of oxygen and carbon dioxide discussed because efficient utilization of carbon dioxide and removal of oxygen is essential for scale-up. Other aspects that will be covered are nutrients supply , temperature effects on microalgal growth, and photobioreactor control and operation. Theory will be supported with practical data from our pilot facility AlgaePARC. At the end, we will return to the biology of microalgae and assess the potential of strain improvement and strain selection with respect to biomass productivity and product accumulation.

PROGRAMME TOPICS

Through lectures, digital cases and a photobioreactor practical, the participants will learn:

- about light-limited growth of microalgae in photobioreactors
- to cultivate microalgae in fully controlled bench-scale photobioreactors
- to design efficient gas-liquid transfer of carbon dioxide and oxygen
- about reactor control (pH, dissolved CO_2 and O_2)
- about medium design and supply of inorganic nutrients
- about temperature effects on algal growth and its control
- to integrate the acquired knowledge into efficient production strategies for microalgae,
- to evaluate the impact of process parameters on production costs including the aspect of scale
- to recognize the potential and be acquainted with different approaches of strain selection and improvement, for biomass production and product accumulation

COURSE LECTURERS

- Prof. **Maria Barbosa**, Wageningen University & Research, Bioprocess Engineering – AlgaePARC
- Dr **Marcel Janssen**, Wageningen University & Research, Bioprocess Engineering – AlgaePARC
- Dr **Sarah D'Adamo**, Wageningen University & Research, Bioprocess Engineering – AlgaePARC
- Prof. **René Wijffels**, Wageningen University & Research, Bioprocess Engineering – AlgaePARC

PARTICIPANTS

The course is aimed at PhD candidates, postdoctoral researchers, and professionals from both academia and industry, who would like to acquire a thorough understanding of microalgal metabolism and photobioreactor design and operation. An MSc level in bioprocess technology, or alike, is recommended..

	Early Bird Fee**	Regular fee**
VLAG / WU PhD candidates	€ 425	€ 475
PhD candidates	€ 650	€ 700
Postdocs and other academic staff / Non-profit	€ 1025	€ 1075
Participants from the private sector	€ 2800	€ 2850

ALGAE BIOREFINERY COURSE

We can offer a discount in total course fee when taking this course together with the course Algae Biorefinery (30 June – 3 July 2025). Please contact yvonne.smolders@wur.nl

COURSE INFORMATION AND REGISTRATION

For the full course details and registration link

SCAN ME

https://www.vlaggraduateschool.nl/en/courses/course/mpd25.htm