

**FACE-TO-FACE TRAINING COURSE:
RECIRCULATING AQUACULTURE SYSTEM (RAS) TECHNOLOGY**

DATE: 6 – 9 MAY 2019

LOCATION: WAGENINGEN UNIVERSITY, THE NETHERLANDS

**FREE
TRAINING COURSE**



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COURSE DESCRIPTION

Recirculating Aquaculture Systems (RAS) were originally developed to grow freshwater species and produce marine juveniles. However, RAS technology has increasingly been used for the on-growing of a wide variety of fish (including marine species) and shellfish. RAS can be operated irrespective of the target temperature and salinity, and the annual production capacity of some industrial systems can now amount to thousands of tons.

As part of this course, leading experts in RAS technology will present the principles and concepts in RAS and discuss the operation of conventional and 'ecosystem approach'-based RAS. Participants will gain an understanding of the principles of recirculation technology, the types of RAS and their specificities, capabilities and limitations, the advantages and necessary conditions for the optimal use / operation of RAS, and the ongoing research which can increase its efficiency and nutrient use.

COURSE CONTENT

Training will be provided through traditional lectures, practical exercises and field visits to experimental facilities.

Lecture topics will include;

- Aspects of recirculation technology relevant to research
- Design, management, operation and evaluation of RAS
- Fish consumption and production: system mass balance and model
- Closing systems
- Minimising water and nutrient use
- Different use of Recirculating Aquaculture Systems (RAS)

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COURSE CONTENT

The course will include a RAS industry mini seminar organised with NGvA (the Dutch association for aquaculture) and Aquarius (aquaculture student organisation). This seminar will include discussions on the state of RAS in the world, the requirements of Atlantic salmon smolts and post smolts in RAS, Yellowtail Kingfish and off flavour and RAS in practice. It will also present an opportunity to network and discuss RAS developments with other course participants and experts from research and industry.

As part of the course, participants will take part in a **technical visit** to experimental facilities; the Aquaculture and Fisheries Group - Aquatic Research Facility (AFI-ARF) and the Recirculating eel farm (200 MT production capacity).

COURSE ORGANISERS

Aquaculture and Fisheries Group, Wageningen University (the Netherlands), with the expertise of Ifremer (France), Nofima (Norway), NTNU (Norway) and DTU (Denmark).

TARGET AUDIENCE

This course is designed for aquaculture professionals (e.g. engineers, researchers, etc.) interested in the potential applications of RAS. Participants should have (basic) knowledge of aspects of recirculation technology. This knowledge can be on the design or operational use.

The industry mini-seminar is designed (1) for the participants to network with professionals and (2) for professionals who would like to hear the latest discussions and scientific developments in the RAS sector and to better understand the needs for RAS development in other countries.

COURSE TUTORS

- **Geert Wiegertjes** - WU, the Netherlands
- **Johann Verreth** - WU, the Netherlands
- **Johan Schrama** - WU, the Netherlands
- **Ep Eding** - WU, the Netherlands
- **Vasco Mota** - Nofima, Norway
- **Raoul Piedrahita** - California, USA
- **Olaf Valdstein** - NTNU, Norway
- **Per Bovbjerg Pedersen** - DTU, Denmark
- **Edward Schram** - ASG, the Netherlands
- **TBC** - Kingfish Zeeland, the Netherlands

PRACTICAL INFORMATION

Location: Wageningen University, Wageningen, the Netherlands

Date & Time: Monday 6 (09:00hrs) to Thursday 9 (17:30hrs) May 2019

Application deadline: 19 March 2019

Fees: Course attendance is free, thanks to EC H2020 funding. Participants are expected to pay for their own travel, subsistence and accommodation.

Maximum participants: 25 people

Language of instruction and material: English

REGISTRATION

Official registration forms and additional course information can be found on the AQUAEXCEL²⁰²⁰ website at <https://aquaexcel2020.eu/training-courses/upcoming-training-courses-apply-now>.

Note: Please do not make travel arrangements unless you have received official confirmation of selection.