



Faculty of Health, Science and Technology  
Environmental and Energy Systems

# Syllabus

## Cleaning technology continuation course

<b>Course Code:</b>	EMAD21
<b>Course Title:</b>	Cleaning technology continuation course <i>Reningsteknik fördjupning</i>
<b>Credits:</b>	7.5
<b>Degree Level:</b>	Master's level
<b>Progressive Specialisation:</b>	Second cycle, has only first-cycle course/s as entry requirements (A1N)

**Major Field of Study:**  
MEI (Environmental and Energy Systems)

### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2021-02-24, and is valid from the Autumn semester 2021 at Karlstad University.

### Prerequisites

Registered on 180 ECTS credits within the Master programme in Energy and Environmental Engineering, with the courses Cleaning Technologies (15 ECTS credits), Environmental Chemistry (7.5 ECTS credits), Energy and Environmental Systems Analysis (30 ECTS credits), and Calculus in Several Variables (7.5 ECTS credits) completed, plus upper secondary level Swedish 3 or B or Swedish as a second language 3 or B, and English 6 or A, or equivalent

### Learning Outcomes

Upon completion of the course, students should be able to:

- develop dynamic calculation models for cleaning technology systems,
- evaluate the credibility of dynamic calculation models,
- use models to optimise cleaning technology processes,
- plan practical evaluation and optimisation experiments in a resource-effective and time-effective manner,

- describe the execution of experiments in a repeatable scientific manner, and
- demonstrate statistical accuracy in experimental results.

### **Content**

The course comprises two parts, both of which include practical components.

1) Modelling of cleaning technology systems/Specialisation in a selected cleaning technology system.

Modelling of dynamic biological cleaning processes that are dependent on external variables such as for example changes in temperature or flow. Students build a model of an existing cleaning technology process, verify the model, and use the model to optimise several synergetic processes. They also propose changes meant to optimise processes.

2) Systematic trial planning.

Plan and carry out laboratory tasks for which a large number of parameters can be varied. Describe the implementation and results of experimental trials.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on written hand-in assignments that are also presented orally.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

### **Grades**

One of the grades Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course. For students in Engineering programmes, one of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), or U (Fail) is awarded in the examination of the course.

### **Quality Assurance**

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

### **Course Certificate**

A course certificate will be provided upon request.

### **Additional information**

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.