

# MSC IN BIOTECHNOLOGY AND CHEMICAL ENGINEERING \*

DEVELOPING THE PROCESSES OF THE FUTURE

Developing and optimising chemical and biotechnological processes plays a key role in modern society. It is predicted that the industry of the future will be characterised by production that is environmentally correct and energy-efficient.

In the first year of the Biotechnology and Chemical Engineering programme, learning is mainly based on lectures and theoretical exercises. The second year mainly consists of project work, which involves students working closely with external companies. Students who are hungry for more have the possibility of continuing with a PhD. On this path, the student adds three extra years to their studies, working more independently on solving concrete problems. This can also take the form of an industrial PhD in collaboration with a company.

## CHOOSING YOUR SPECIALISATION

The focus of the degree programme is the development and optimisation of processes in the chemical and biotechnological industries and in the environmental sector. If you have an engineering background in chemistry and choose to pursue this specialisation at MSc level, you will be able to work with areas as diverse as food, polymer chemistry, and membrane and separation technology. If on the other hand your background is in biotechnology, you can pursue this specialisation to gain opportunities to work in areas such as developing enzymes and proteins for use in 'green' production, lipid technology, and medical biotechnology. Whether your background is in chemistry or biotechnology, you will also be able to specialise in environmental technology, leading to opportunities to work in areas such as odour-monitoring in farming and biogas production.

## PUTTING RESEARCH INTO PRACTICE

Teaching at Aarhus University is greatly influenced by the research conducted here, as all the lecturers are active researchers. As an engineering student, you have excellent opportunities to work with researchers in the laboratory, or you can complete a project in collaboration with a private company.

## STUDENT LIFE

The Aarhus University School of Engineering has a range of social spaces where you can meet other students outside class, and this is an excellent basis for social activities. There is also an engineering club for staff and students for networking with like-minded people. As in all departments, there is a popular Friday bar, and the Tågekammeret association organises celebrations and social events for all science and technology students.



I work in a department where we develop and test enzymes for animal feed. DuPont sells enormous amounts of enzymes for animal feed all over the world. Our customers could be producers of feed for herds of pigs or flocks of chickens who add maize, soy or grain to their compound feeds. Customers are interested in having the products tested, partly because they want to save on feed costs, but also because they want to ensure animal welfare. If you add a little more soy, for example, you can save on expensive raw materials and – if the animals are not adversely affected – it will be an advantage for everyone.

### SOLVEJ KNUDSEN

MSc in Chemistry and Biotechnology  
Senior Research Associate, DuPont Industrial Biosciences

## CAREERS

As a graduate engineer in Chemistry and Biotechnology, you will be developing the processes of the future – processes that will ensure that chemical, biotechnological and environmental knowledge finds sustainable applications that can benefit society as a whole. The MSc programme is also monitored by representatives of chemical companies such as DuPont, Arla, Aarhus Karlshamn and Cheminova, all of which are interested in employing newly qualified graduate engineers in chemistry and biotechnology.



### PLACE OF STUDY

Aarhus

### WWW

masters.au.dk/biotechchemical

### ANNUAL TUITION FEE

EU/EEA/Swiss citizens: FREE  
Others: EUR 13,500

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Due to changes in the general semester structure at the Faculty of Science & Technology from summer 2017, changes will occur in the programme structure and content from summer 2017 – to be announced in the spring of 2017.

## SPECIALISATION IN CHEMISTRY

1 <sup>ST</sup> SEMESTER	2 <sup>ND</sup> SEMESTER	3 <sup>RD</sup> SEMESTER	4 <sup>TH</sup> SEMESTER
Compulsory Courses	Compulsory Courses	Elective Courses	THESIS
Compulsory Courses	Compulsory Courses	Elective Courses	
Compulsory Courses	Compulsory Courses	Elective Courses	
Specialised Study Package in Chemistry	Elective Courses	Elective Courses	
	Elective Courses	Elective Courses	
Elective Courses	Elective Courses	Elective Courses	
30 ECTS	30 ECTS	30 ECTS	30 ECTS

### COMPULSORY COURSES CHEMISTRY

#### SPRING

Sensors & Process Control 10 ECTS

Fluid Dynamics 5 ECTS

#### FALL

Modelling of Biological and Chemical Processes 10 ECTS

Advanced Chemical Unit Operations 5 ECTS

## SPECIALISATION IN BIOTECHNOLOGY

1 <sup>ST</sup> SEMESTER	2 <sup>ND</sup> SEMESTER	3 <sup>RD</sup> SEMESTER	4 <sup>TH</sup> SEMESTER
Compulsory Courses	Compulsory Courses	Elective Courses	THESIS
Compulsory Courses	Compulsory Courses	Elective Courses	
Compulsory Courses	Compulsory Courses	Elective Courses	
Compulsory Courses	Elective Courses	Elective Courses	
Compulsory Courses	Elective Courses	Elective Courses	
Compulsory Courses	Elective Courses	Elective Courses	
30 ECTS	30 ECTS	30 ECTS	30 ECTS

### COMPULSORY COURSES BIOTECHNOLOGY

#### SPRING

Protein Biotechnology 10 ECTS

Fluid Dynamics 5 ECTS

#### FALL

Modelling of Biological and Chemical Processes 10 ECTS

Advanced Chemical Unit Operations 5 ECTS

Science and Technological Innovation and Entrepreneurship 5 ECTS

Lipid Biotechnology 10 ECTS

### ELECTIVE COURSES

Choose courses from the specialised study packages or other courses at the Department of Engineering and the broader Faculty of Science approved by the study programme manager. AU Course Catalogue: [kursuskatalog.au.dk/en/](http://kursuskatalog.au.dk/en/)