

## **Dual degree Master of Science in Engineering in Ocean Systems Engineering / Wind Energy with (KAIST) Korean Advanced Institute of Science and Technology**

As a dual degree master student- one year at DTU and one year at KAIST, Korean Advanced Institute of Science and Technology – you get a Danish and an International degree, which gives you personal and academic skills and experiences.

KAIST is among the world’s leading research – oriented universities in science and engineering with campus in Daedeok Innopolis, in the city of Daejeon, the heart of Korea’s innovation. Established as a research – oriented university in 1971, KAIST is closely linked to the strong economic development of Korea.

### **Study abroad**

Studying abroad gives you an International perspective, which helps in personal growth. Besides, it is also a great opportunity to create an international network; a chance to explore other ways to apply technology and to experience a different way of teaching /learning.

### **Dual degree**

In collaboration with KAIST, we offer a dual degree two – year MSc programme in Master of Science (MS) or Master of Science in Engineering (MSc Eng) degree from each university. The medium of instruction is English.

### **Description of the programme**

The standard period of study is four semesters, which corresponds to 120 ECTS, consisting of three semesters of course work, and a master thesis that is usually written in the fourth semester. A standard period of two consecutive semesters should be taken at the host institution.

The recommended study tracks are:

For KAIST students:

Sem1	Sem 2	Sem 3	Sem 4
KAIST	DTU	DTU	KAIST

For DTU students:

Alternative 1

DTU	DTU	KAIST	KAIST
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Alternative 2

DTU	KAIST	KAIST	DTU
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## **Curricular conditions**

KAIST uses a credit transfer system similar to the European Credit Transfer System (ECTS). Three (3) KAIST credits are equivalent to ten (10) DTU ECTS. Students are required to earn 18 credits from KAIST and 60 ECTS from DTU during their Dual Degree Master Program.

Upon approval by both the program coordinators (host and home), a maximum of 3 KAIST credits can be substituted by 10 DTU ECTS and vice versa.

## **Programme structure and requirements**

The program requirements consist of four components:

- General competence courses
- Specialization courses
- Elective courses
- Master thesis

**Please note:** 30 DTU ECTS, equal to 9 KAIST credits

### ***DTU Courses***

The list of courses provided below is based on the DTU Study Handbook 2013/14.

(<http://shb.dtu.dk/Default.aspx?documentid=3179&Language=en-GB&lg=&version=2013/2014>)

### **General Competence Courses**

The general competences are achieved by completing the mandatory course.

### **Technological Specialization courses**

This group contains courses on central areas of Wind Energy at a level that offers state-of-the-art competences. Any combination of courses can be selected but if you have chosen to follow a study line, this may enforce restrictions on the technological specialization courses that you can follow.

In any case, it is your responsibility to choose courses with a professional progression which ensures that you achieve state-of-the-art competences. The student must take 30 DTU ECTS among the following list of courses:

#### *DTU Autumn Semester*

- |       |   |
|-------|---|
| 41128 | Turbulence theory (7.5 ECTS)                                  |
| 42490 | *Technology, Economics, Management and Organization (10 ECTS) |
| 46100 | Introduction to Micro Meteorology for Wind Energy (5 ECTS)    |

- 46210 \*Offshore Wind Energy (10 ECTS)
- 46300 \*Wind Turbine Technology and Aerodynamics (10 ECTS)
- 46320 Loads, Aerodynamics and Control of Wind Turbines (10 ECTS)
- 46400 Wind Turbine Measurement Technique (10 ECTS)

*Spring Semester*

- 41106 Marine Structures I (5 ECTS)
- 41126 Fluvial and Marine Sediment Transport (5 ECTS)
- 41214 Dynamics of Structures: Theory and Analysis (7.5 ECTS)
- 41323 Advanced Fluid Mechanics (10 ECTS)
- 42490 \*Technology, Economics, Management and Organization (10 ECTS)
- 46310 Projects in Wind Turbine Aeroelasticity (10 ECTS)
- 46xxx Aerodynamics (5 ECTS)

Note that \* indicates mandatory courses. 42490, which will be offered in both semesters, can be swapped with CC530.

*Intensive courses during break*

- |       |  |                |
|-------|--|----------------|
| 46200 | Planning and Development of Wind Farms | 5 ECTS January |
| 41315 | Applied CFD                            | 5 ECTS June    |

**Electives**

In accordance with DTU's requirements for the MSc program in Wind Energy, students may choose 30 DTU ECTS among all BSc/MSc advanced level course from the DTU course base.

Note that more detailed course descriptions are available from Course Base (<http://www.kurser.dtu.dk/search.aspx?menulanguage=en-GB>).

***KAIST courses***

Required Credits for Graduation: at least 33 credits

**COMMON COURSES:** 3 credits and 1 AU

- One of the following courses: CC510, CC511, CC512, CC522

Credits by taking one of CCS00-530 courses can be swapped with an equivalent course in DTU and vice versa.

\*CC020 Ethics and Safety I (1AU)

Note that \* indicates mandatory courses.

CC010 Special Lecture on Leadership (0 credit)  
CC500 Scientific Writing (3 credits)  
CC510 Introduction to Computer Appl. (3 credits)  
CC511 Probability and Statistics (3 credits)

CC512 Introduction to Materials and Engineering (3 credits)  
CC513 Engineering Economy and Cost Analysis (3 credits)  
CC522 Introduction to Instruments (3 credits)  
CC530 Entrepreneurship and Business Strategies (3 credits)  
CC532 Collaborative System Design and Engineering (4 credits)

**REQUIRED MAJOR COURSES: NONE**

**SELECTIVE MAJOR COURSES:** At least 18 KAIST credits are required, with at least 12 KAIST credits from Ocean Systems Engineering courses (see below). In accordance with KAIST's requirements for the MS program in Ocean Systems Engineering, students may choose any BS/MS advanced level courses from the KAIST course base.

**Spring Semester**

OSE542	S Dynamics of Offshore Structures (3 credits)
OSE544	S Vibration of Offshore Structures (3 credits)
OSE551	S Reliability and Risk Analysis for Offshore Plants (3 credits)
OSE620	S Ocean Wave Mechanics (3 credits)
OSE632	S Construction of Offshore Structures (2 credits)
OSEB00	S Offshore Wind energy (3 credits)
OSEB00	S Statistical Analysis of Oceanographic Data (3 credits)

**Fall Semester**

OSE521	F Ocean environments and wave loads (3 credits)
OSE522	F Introduction to Fluid-Structure Interactions (3 credits)
OSE532	F Finite Elements Analysis of Structures (3 credits)
OSEB00	F Numerical Methods and Applications to Ocean Engineering (3 credits)

***Master's thesis***

A master thesis (in English) at both universities requires thirty (30) DTU ECTS and nine (9) KAIST credits.

At KAIST, the thesis process normally starts in the 3rd semester and an interim report must be submitted 6 months prior to the thesis submission. At DTU, the master thesis is usually conducted during the fourth semester of the program. The thesis will be conducted with co-supervision from both institutions. The thesis supervisor at the institution where the master thesis work is conducted will act as the main supervisor and will thus have the primary responsibility for the student. Local thesis rules will apply. The subject of the master thesis as well as a project description must be approved by both thesis supervisors.

The thesis must be presented at an oral defense according to the rules and regulations of both universities.

At DTU, the master thesis is graded using the 7 grade scale, with the grade appearing on the Master degree diploma. The grade will be determined by the DTU thesis supervisor and an external examiner according to the Danish rules and regulations on examination. At KAIST passed/not passed is used when evaluating thesis work conducted at KAIST.

### **Degrees obtained**

Upon graduation, the student will be awarded the Master's degrees of each university with a special designation of the dual degree programme i.e. the degrees awarded are

- MS in Ocean Systems Engineering from KAIST,
- MSc in Wind Energy from DTU.

### **Admission procedure for DTU students**

The programme is open to MSc in Wind Energy students at DTU upon application. Applications are evaluated by DTU and then reviewed and approved by KAIST.

**Deadlines** for receiving applications at the partner institution are October 15th to start the program in the spring semester and April 1st to start in the fall semester.

### **Further information**

Please contact: Associate Professor Taeseong Kim, [tkim@dtu.dk](mailto:tkim@dtu.dk).

Contact person at DTU Department for Education and Students: Maria Runering, [maru@adm.dtu.dk](mailto:maru@adm.dtu.dk)