Course Specifications
Valid as from the academic year 2020-2021

Structural Analysis Calculation Techniques I (E711023)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course

Specifications

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Course size

(nominal values; actual values may depend on programme)

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
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<tr>
<td>3.0</td>
<td>90 h</td>
<td>24.0 h</td>
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Course offerings and teaching methods in academic year 2020-2021

A (semester 1)

Dutch

Gent

lecture: plenary exercises

6.0 h

lecture

18.0 h

Lecturers in academic year 2020-2021

Vandedrinck, Frank

TW14

lecturer-in-charge

Offered in the following programmes in 2020-2021

| Bachelor of Science in Engineering Technology (main subject Civil Engineering Technology) | 3 | A |
| Linking Course Master of Science in Civil Engineering Technology | 3 | A |
| Preparatory Course Master of Science in Civil Engineering Technology | 3 | A |
| Preparatory Course Master of Science in Land Survey Engineering Technology | 3 | A |

Teaching languages

Dutch

Keywords

Stractically determinate and indeterminate structures, lines of bending moments, shear forces,..., stress and strength, influence lines for statically determinate and indeterminate structures.

Position of the course

This course is intended to provide the student with the theory and application of structural analysis as it applies to beams and frames for dead as well as live loads (calculate influence lines).

Analysis of indeterminate structures under dead loads.

Developing the students ability to both model and analyse a structure and to provide realistic applications encountered in professional practice.

Contents

Calculations of both static determinate and indeterminate structures. Using influence lines the calculation of the maximal effect of shear forces and bending moment can be done in different points of the structure.

Influence lines allow also to solve the problem of the static indeterminate structure.

General methods for the analysis of indeterminate structures:

Practical exercises based on the calculation techniques from above.

Initial competences

To have critical insight into the general principles of equilibrium of structures.

Being able to determine and interpret the internal forces - i.e. bending moments, shear forces and normal forces - in beams and columns, and the related stresses and deflections caused by dead loads in static determinate and a few indeterminate structures.

See final competences of STERKTELEER.

Final competences

1 The student analyses and calculates statically determinate and indeterminate structures in an anorganic way.
2 The student generates in an analytical way influence lines, to determine the internal
forces of the given load bearing structure.
3 The student generates in a graphical way influence lines, to determine the internal forces of the given load bearing structure.
4 The student generates in an analytical way influence lines, to determine internal forces and deformations of the given structure, under every possible combination of dead and live loads.
5 The student generates in a graphical way influence lines, to determine internal forces and deformations of the given structure, under every possible combination of dead and live loads.
6 The student uses the influence lines to solve the problem of static indetermination of the given structure, and also to determine the most extreme values of the internal forces under every possible combination of dead and live loads.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Lecture, lecture: plenary exercises, online lecture

Extra information on the teaching methods
Classroom and online lectures: 18u
Classroom problem solving sessions: 6h

Learning materials and price
Teacher’s course (Dutch language): digitally available for free;
Supplementary courseware and calculation examples exercises are also available for free on the e-learning platform.

References
See references teacher’s course and supplementary courseware

Course content-related study coaching
1. Guidance and coaching bij lecturer and assistant: Possibility to obtain individual explanation in case of any problem;
2. E-learning platform: Students can visit an electronic workspace for supplementary courseware and possible examination questions.

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination, skills test

Examination methods in case of periodic evaluation during the second examination period
Written examination, skills test

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
examination during the second examination period is not possible

Extra information on the examination methods
End-of-term evaluation: written exam.
The examination consists of an evaluation of theoretical insights as well as a skills test.

Calculation of the examination mark
End-of-term evaluation: 100%

(Approved)