<table>
<thead>
<tr>
<th>Course Title</th>
<th>Risk Analysis in Civil and Environmental Engineering</th>
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<tbody>
<tr>
<td>Course Unit Code</td>
<td>CEE 512</td>
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<tr>
<td>Type of Course Unit</td>
<td>Optional</td>
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<tr>
<td>Level of Course Unit</td>
<td>2nd and 3rd cycle</td>
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<tr>
<td>Year of Study</td>
<td>Graduate studies</td>
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<tr>
<td>Semester when the Course Unit is Delivered</td>
<td>Spring</td>
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<tr>
<td>Number of ECTS Credits Allocated</td>
<td>8.0</td>
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<tr>
<td>Name of Lecturer(s)</td>
<td>S. Christodoulou, D. Charmpis</td>
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**Learning Outcomes of the Course Unit**

Students should be able to:
1. Understand and apply fundamentals in probability and statistics,
2. Perform hypothesis testing, confidence interval estimation, and survival analysis models
3. Develop risk and reliability models for various engineering applications (buildings, networks and infrastructure, construction schedules, series/parallel systems, etc.)
4. Apply modern techniques in data mining (e.g., ANN) for risk analysis,
5. Develop/implement relevant software applications

**Prerequisites**
There are no prerequisites for this course.

**Co-requisites**
There are no prerequisites for this course.

**Course Contents**
Advanced topics is stochastic analysis in Civil and Environmental Engineering. Probability and statistics, data analysis, risk assessment and analysis, hypothesis testing, multifactored analysis, decision trees, neurofuzzy systems, regression, system reliability, and simulation of civil and environmental systems.

**Required Reading**
N/A

**Recommended Reading**
1. Walpole, R. E., Probability and Statistics for Engineers and Scientists, Prentice Hall.

**Planned Learning Activities**
Term Project, Case Studies and Assignments

**Teaching Methods**
Lectures (3 hours/week)

**Assessment Methods and Criteria**
Term project, final exam & presentation, midterm exam and homework assignments

**Language of Instruction**
Greek

**Work Placement(s)**
N/A