DUAL M.S. IN CIVIL ENGINEERING WITH THE UNIVERSITY OF BOLOGNA

The Department of Civil, Architectural, and Environmental Engineering (CAE) at the University of Miami (UM) has partnered with the University of Bologna (UNIBO) in Italy to offer a dual Master of Science degree program in Civil Engineering (Dual MSCE). Each dual degree program is structured in four semesters and consists of courses and research with two semesters to be completed at UM, and two semesters to be completed abroad at UNIBO. The degrees conferred by each institution are as follows:

Dual Degree Program Area of Emphasis

Civil Engineering
Environmental Engineering

Academic Degree Obtained at UNIBO

Laurea Magistrale in Civil Engineering (Classe LM) - Taught in English

Laurea Magistrale in Ingegneria per l'Ambiente ed il Territorio (Classe LM 35) - “Earth Resources Engineering” International Curriculum taught in English

Academic Degree Obtained at UM

MS in Civil Engineering
MS in Civil Engineering (Environmental Emphasis)

Upon Completion of the Dual Degree Program requirements, the students will be awarded two separate and distinct Master’s of Science degrees.

This program is open to students who are admitted to the graduate program at the end of their junior year as part of the 4+1 (BS + MS) program. Students applying for this program must have a minimum grade point average of 3.0, and score more than 300 on the Graduate Record Examination (GRE).

Once enrolled in the 4+1 (BS+MS) program, students are eligible to apply to the dual MS degree program. The five-year program leading to a B.S. and dual M.S. degrees (BS/2MS) can be completed in 10 semesters as long as the student makes satisfactory progress.

Admission to the 4+1 (BS+MS) program and the BS + dual M.S. program is conducted through the College of Engineering Admissions Office. Any student interested in applying should contact the Director of Admissions in the College of Engineering and their academic advisor in the CAE Department. Both should conduct an overview and feasibility study based on the student’s current program of study, and discuss the application requirements and timeline.

The curriculum for the dual M.S. degree program consists of courses that are required for the MS-UM degree, courses for the MS-UNIBO degree, and common courses shared between the programs. In general, students will enroll in the following program of study during their 4th year (Senior Year), and 5th year (at UNIBO). The table is shown in UM credit equivalents:

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Semester I</td>
<td></td>
</tr>
<tr>
<td>Take PS/HA Cognate Course in Freshman Semester;</td>
<td></td>
</tr>
<tr>
<td>Add the following courses:</td>
<td></td>
</tr>
<tr>
<td>Graduate Level Course</td>
<td>3</td>
</tr>
<tr>
<td>Graduate Level Course</td>
<td>3</td>
</tr>
<tr>
<td>Spring Semester II</td>
<td></td>
</tr>
<tr>
<td>CAE 604</td>
<td>Master’s Design Project</td>
</tr>
</tbody>
</table>
Students shall submit an individual Program of Study to select courses as part of the program. The individual study program must be approved by both institution's Academic Coordinators. A thesis is required as part of the program and will be completed at UNIBO while working with an advisor at UM. Students must defend their Master's Thesis according to the rules and modalities of UNIBO to obtain the Laurea Magistrale degree.

Program credits are reported using two systems: the European Credit Transfer System (ECTS) and the United States College Credit System (US). The transfer rate between the systems is 2 ECTS credits = 1 US credit. The credit requirements for each MS program are based on the transfer credits between the institutions.

Any deviation from the designated course lists requires pre-approval by the student's UM supervisory committee, the UM CAE Graduate Program Director, and the UNIBO Academic Advisor prior to course registration.

**5 YEAR BS/DUAL MS**

**COURSE SCHEDULE FOR CIVIL ENGINEERING**

4th Year (Senior Year at UM): All courses in Table A (24 U.S., 48 ECTS) + 2 courses in Table B (6 U.S., 12 ECTS)

5th Year (at UNIBO): The remaining courses in Tables B and C (24 U.S., 48 ECTS) + Civil Engineering Research (6 U.S., 12 ECTS) + CAE 795: Special Problems (4 U.S., 8 ECTS). Courses in Table C consist of Curriculum courses and Elective courses which can be chosen by the student, depending on the study area they are interested. They are shown in Tables E, F, and G.

**TABLE A**

<table>
<thead>
<tr>
<th>UM Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CAE 402</td>
<td>Professional Engineering Practice</td>
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</tr>
<tr>
<td>CAE 450</td>
<td>Transportation Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>CAE 470</td>
<td>Foundations and Earth Retaining Systems</td>
<td>3</td>
</tr>
<tr>
<td>CAE 520</td>
<td>Advanced Design of Concrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>CAE 530</td>
<td>Water Resources Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>CAE 604</td>
<td>Master's Design Project</td>
<td>3</td>
</tr>
<tr>
<td>As well as TWO Courses among the following:</td>
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<td></td>
</tr>
<tr>
<td>CAE 611</td>
<td>Advanced Structural Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CAE 621</td>
<td>Advanced Design of Steel Structures</td>
<td>3</td>
</tr>
<tr>
<td>MAE 607</td>
<td>Advanced Mechanics of Solids</td>
<td>3</td>
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### TABLE A

<table>
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<tr>
<td></td>
<td>CAE 711</td>
<td>Theory of Elasticity</td>
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### TABLE B

<table>
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<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Infrastructure Systems</strong></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Advanced Hydrosystems Engineering</strong></td>
<td>9</td>
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<tr>
<td></td>
<td></td>
<td><strong>Design Projects</strong></td>
<td>6</td>
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<td></td>
<td></td>
<td><strong>Civil Engineering Research A</strong></td>
<td>6</td>
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<td></td>
<td></td>
<td><strong>Advanced Design of Structures</strong></td>
<td>9</td>
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<tr>
<td></td>
<td></td>
<td><strong>Advanced Structural Mechanics</strong></td>
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<td></td>
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### TABLE C

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<th>Title</th>
<th>Credit Hours</th>
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<td></td>
<td></td>
<td><strong>Managing Engineering and Construction Processes</strong></td>
<td>6</td>
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<td></td>
<td></td>
<td><strong>Numerical Methods I</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Geotechnical Engineering</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Numerical Methods II</strong></td>
<td>6</td>
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<td><strong>Total Credit Hours</strong></td>
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* Numerical Methods I & II may be offered in a combined course worth 12 credit hours.
### TABLE D

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>CAE 810</td>
<td>Master's Thesis</td>
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<td>Total Credit Hours</td>
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### UNIBO

<table>
<thead>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>Civil Engineering Research B</td>
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### TABLE E

**Curriculum 1 - Structural Engineering**

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>Mechanics of Historical Masonry Structures ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Structural Safety ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Structural Strengthening &amp; Rehabilitation ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Computational Mechanics ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Earthquake Engineering ECTS</td>
<td></td>
<td>6</td>
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</table>

### TABLE F

**Curriculum 2 - Territorial Infrastructures**

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>Applied Geomatics ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Context-Sensitive Design in Transportation Infrastructures ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Advanced Hydrology &amp; Water Resource Management ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Coastal Engineering ECTS</td>
<td></td>
<td>6</td>
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</table>

### TABLE G

**ELECTIVE COURSES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Geology ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Science and Technology of Composite Materials ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Sustainability in Construction ECTS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Biotechnology for the Sustainable Reclamation of Contaminated Lands and Waters ECTS</td>
<td></td>
<td>6</td>
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</tbody>
</table>

### COURSE SCHEDULE FOR ENVIRONMENTAL ENGINEERING

**4th Year (Senior Year at UM):** All the courses in Table A (24 U.S., 48 ECTS) + 2 courses in Table B (6 U.S., 12 ECTS)

**5th Year (at UNIBO):** The remaining courses in Tables B and C (24 U.S., 48 ECTS) + Civil Engineering Research (6 U.S., 12 ECTS) + CAE 795 Special Problems (4 U.S., 8 ECTS)

### TABLE A

**UM**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CAE 402</td>
<td>Professional Engineering Practice</td>
<td>3</td>
</tr>
<tr>
<td>CAE 430</td>
<td>Water-Resources Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>CAE 440</td>
<td>Water Quality Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>CAE 530</td>
<td>Water Resources Engineering II</td>
<td>3</td>
</tr>
<tr>
<td>CAE 533</td>
<td>Water-Quality Control in Natural Systems</td>
<td></td>
</tr>
<tr>
<td>CAE 540</td>
<td>Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CAE 542</td>
<td>Solid and Hazardous Waste Engineering</td>
<td></td>
</tr>
<tr>
<td>CAE 604</td>
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<td>3</td>
</tr>
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### UNIBO

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>Industrial Ecology M</td>
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<td>9</td>
</tr>
<tr>
<td>Advanced Hydrosystems Engineering M</td>
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</tr>
<tr>
<td>Water Engineering - Advanced Hydrology &amp; Water Resources Management M</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Industrial Safety M</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Resources and Recycling M</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Laboratory of Environmental Engineering</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Laboratory on Alternative and Renewable Raw Materials</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Environmental Engineering Research A</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
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### TABLE B

#### UM

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>MAE 601</td>
<td>Methods of Engineering Analysis</td>
<td>3</td>
</tr>
<tr>
<td>CAE 641</td>
<td>Engineering Systems for Disease Control and Bioremediation</td>
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</tr>
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<td>CAE 670</td>
<td>Advanced Foundation Engineering</td>
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### UNIBO

<table>
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</thead>
<tbody>
<tr>
<td>Numerical Methods I</td>
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<td>6</td>
</tr>
<tr>
<td>Biotechnology for the Sustainable Reclamation of Contaminated Lands and Waters M</td>
<td></td>
<td>6</td>
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<tr>
<td>Geotechnical Engineering</td>
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### TABLE C

#### UM

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<tbody>
<tr>
<td>CAE 730</td>
<td>Environmental Hydrology</td>
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<tr>
<td>CAE 735</td>
<td>Water and Wastewater Engineering: Treatment and Reuse</td>
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<td>CAE 743</td>
<td>Risk Analysis</td>
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<tr>
<td>Elective Course</td>
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<tr>
<td>Elective Course</td>
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<td>Elective Course</td>
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<td>Elective Course</td>
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#### UNIBO

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<tr>
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<tbody>
<tr>
<td>Applied Geomatics M</td>
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<tr>
<td>Minerals Production Systems M</td>
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<td>6</td>
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<tr>
<td>Engineering Geology M</td>
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<td>6</td>
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<tr>
<td>Petroleum Geosystems M</td>
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<td>6</td>
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<tr>
<td>Coastal Engineering M</td>
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<tr>
<td>Elective Course</td>
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<tr>
<td>Elective Course</td>
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<td>CAE 810</td>
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<td><strong>UNIBO</strong></td>
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<tr>
<td></td>
<td><strong>Code</strong></td>
<td><strong>Title</strong></td>
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<tr>
<td></td>
<td>Environmental Engineering Research B</td>
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### Grade Equivalencies

The following conversion table of grades applies once a course is completed:

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<th>Grade at UM</th>
<th>Description</th>
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<td>D-</td>
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<td>F</td>
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<td>I (Incomplete)</td>
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<td>W (Withdrawal)</td>
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<table>
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<td>Failed/Respinto</td>
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### Additional Details

- Each Student is required to complete a Program of Study and have it approved by their Supervisory Committee and the Graduate Program Director prior to entering the program.
• Internships, Practical Training, Workshops, or other types of practicum are neither required nor optional credit-earning components in the established graduate curriculum (Program of Study). Credit earned through these experiences (such as UMI 605 (http://bulletin.miami.edu/search/?search=umi+605)) will not count towards any CAE degree requirements. CAE 665 - 669 and CAE 765 - 769 shall not count towards the degree.
• The Supervisory Committee at the University of Miami must have a minimum of 3 members, including:
  1. Committee Chair (Advisor) shall be full-time CAE Faculty and a member of the Graduate Faculty
  2. Full-time or Part-time CAE Faculty
  3. Non-CAE member with an earned Ph.D.

In addition to the Committee Chair, at least one member must be tenured/tenure-earning or a member of the Graduate Faculty.