Underground Construction & Tunneling

Programs Offered
Minor in Underground Construction and Tunneling (18.0 credit hours) and an Area of Special Interest (ASI) (12.0 credit hours).

Program Educational Objectives
Underground Construction and Tunneling is a growing discipline involving knowledge in the disciplines of mining engineering, geological engineering and civil engineering, among others. The Departments of Mining Engineering, Geology & Geological Engineering and Civil and Environmental Engineering offer an interdisciplinary Minor or Area of Special Interest (ASI) course of study that allows students from these departments to take a suite of courses providing them with a basis for work and further study in this field.

The objectives of the minor and ASI are to supplement an engineering background with a formal approach to subsurface engineering that includes site characterization, design and construction of underground infrastructure, including water, storm water, highway or subway tunnels and subsurface facilities.

The Mines guidelines for Minor/ASI can be found in the Undergraduate Information section of the Mines Catalog.

Curriculum
Underground Construction & Tunneling Engineering Minor and ASI

The Underground Construction & Tunneling Engineering minor consists of a minimum of 18 credit hours of coursework from the list below. An Area of Special Interest (ASI) in Underground Construction & Tunneling requires 12 credit hours of coursework from the list below. A student’s advisor may authorize a student’s Minor or Area of Special Interest (ASI) application. For questions about the minor and to request consideration of additional courses including independent study, students should meet with a UC&T faculty member. The petition process requires one month to complete. See the following page for CSM’s Minor and ASI requirements.

Program Requirements:
Required Courses (Minor)

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CEEN312</td>
<td>SOIL MECHANICS</td>
<td>3.0</td>
</tr>
<tr>
<td>MNGN321</td>
<td>INTRODUCTION TO ROCK MECHANICS</td>
<td>3.0</td>
</tr>
<tr>
<td>MNGN404</td>
<td>TUNNELING</td>
<td>3.0</td>
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Electives (Minor)

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<thead>
<tr>
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<tbody>
<tr>
<td>CEEN314</td>
<td>STRUCTURAL THEORY</td>
<td>3.0</td>
</tr>
<tr>
<td>CEEN350</td>
<td>CIVIL AND CONSTRUCTION ENGINEERING MATERIALS</td>
<td>3.0</td>
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<tr>
<td>CEEN360</td>
<td>INTRODUCTION TO CONSTRUCTION ENGINEERING</td>
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Required Courses (Area of Special Interest - ASI)

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Electives (Area of Special Interest - ASI)

Students may choose one course from the required Minor courses or elective courses listed above.

Department of Civil & Environmental Engineering
Marte Gutierrez, Professor
Michael Mooney, Professor

Department of Geology & Geological Engineering
Jerry Higgins, Associate Professor
Wendy Zhou, Associate Professor

Department of Mining Engineering
Hugh Miller, Associate Professor
Ray Henn, Adjunct Professor
Priscilla Nelson, Professor

CEEN499  INDEPENDENT STUDY  1-6
GEGN466  GROUNDWATER ENGINEERING  3.0
or GEGN467 GROUNDWATER ENGINEERING  3.0
GEGN468  ENGINEERING GEOLOGY AND GEOTECHNICS  4.0
GEGN473  GEOLOGICAL ENGINEERING SITE INVESTIGATION  3.0
GEGN499  INDEPENDENT STUDY IN ENGINEERING GEOLOGY OR ENGINEERING HYDROGEOLOGY  1-6
MNGN314  UNDERGROUND MINE DESIGN  3.0
MNGN410  EXCAVATION PROJECT MANAGEMENT  2.0
MNGN424  MINE VENTILATION  3.0
MNGN499  INDEPENDENT STUDY  1-6