TECHNOLOGY, CYBERSECURITY AND POLICY - MASTER OF SCIENCE (MS)

Technology, Cybersecurity and Policy (TCP) teaches cybersecurity from an interdisciplinary perspective which includes aspects of technology, engineering, leadership, policy and applications to emerging technology areas. Among the goals of TCP are to accelerate both research and learning in areas of technology, cybersecurity and policy; to provide relevant content with experiential learning; and to prepare students to be future leaders in these critical areas.

For more information, visit the MS in Technology, Cybersecurity, and Policy [webpage](https://www.colorado.edu/cs/academics/graduate-programs/master-science-technology-cybersecurity-policy/)

Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor’s–Accelerated Master’s (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor’s and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s):

- Applied Computer Science - Post-Baccalaureate Bachelor of Science (BSACS) [webpage](https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/applied-computer-science-post-baccalaureate-bachelor-science-bsacs/)
- Applied Mathematics - Bachelor of Science (BS) [webpage](https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/applied-mathematics/applied-mathematics-bachelor-science-bsam/#acceleratedmasterstext)
- Business Administration - Bachelor of Science (BA)
- Computer Science - Bachelor of Arts (BA) [webpage](https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-bachelor-arts-ba/)
- Computer Science - Bachelor of Science (BS) [webpage](https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-bachelor-science-bs/#acceleratedmasterstext)
- Electrical and Computer Engineering - Bachelor of Science (BS) [webpage](https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/electrical-computer-energy-engineering/electrical-computer-engineering-bachelor-science-bsee/#acceleratedmasterstext)
- Electrical Engineering - Bachelor of Science (BSEE) [webpage](https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/electrical-computer-energy-engineering/electrical-engineering-bachelor-science-bsee/)

TCP Degree Requirements

- GPA of at least 3.00
- Students must complete a total of 30 credit hours of approved graduate level course work with a grade of C or better and maintain a cumulative GPA of at least 3.00.

**Core Courses**

The TCP program has three Core areas: (i) Technology, Thought Leadership and Policy, (ii) Networking and Secure Communications and (iii) Cybersecurity. These three areas form the cornerstones of the TCP degree, and students are required to complete the three courses listed below to explore each area. These areas cover the skills needed to become a leader in Technology, Cybersecurity and Policy and ensures graduates have the technical, policy and strategy skills to work in industry and advance to senior leadership levels. The three Core courses contribute 9 credit hours to the overall degree program.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CYBR 5000</td>
<td>Seminar in Technology, Cybersecurity and Policy</td>
<td>1</td>
</tr>
<tr>
<td>CYBR 5010</td>
<td>Fundamentals of Data Communication</td>
<td>3</td>
</tr>
<tr>
<td>CYBR 5300</td>
<td>Cybersecurity</td>
<td>3</td>
</tr>
</tbody>
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**TCP Depth Areas**

TCP's advanced courses allow students to gain deeper knowledge and focus in the area of their choosing. Students must select a depth area and complete the 15 credit (5 course) requirement associated with that depth area. Three depth areas are currently available.

**Cybersecurity Engineering**

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<tr>
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<tbody>
<tr>
<td>CYBR 5320</td>
<td>Cybersecurity Network Analytics</td>
<td>3</td>
</tr>
<tr>
<td>CYBR 5330</td>
<td>Digital Forensics</td>
<td>3</td>
</tr>
<tr>
<td>CYBR 5350</td>
<td>Security Auditing and Penetration Testing</td>
<td>3</td>
</tr>
</tbody>
</table>

**Advanced Electives**

Choose two:

- CYBR 5240 Introduction to Blockchain
- CYBR 5310 Immersive Cyber Defense
- CSCI 5413 Computer Security and Ethical Hacking

Some TCP special topics classes (CYBR 5830) can be applied to the cybersecurity engineering depth area. For details, see the TCP student handbook or speak with the TCP graduate program advisor.

**Secure Communications**

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<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CYBR 5200</td>
<td>Introduction to Wireless Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

For more information, visit the MS in Technology, Cybersecurity, and Policy [webpage](https://www.colorado.edu/cs/academics/graduate-programs/master-science-technology-cybersecurity-policy/)
Thesis Exam) before the thesis examining committee. Examination Report

School. The student works primarily with the thesis advisor and provides
committee must be approved by the TCP Program and by the Graduate
work with a faculty advisor to complete a thesis on a topic of mutual
complete a thesis, the student must get approval from a faculty member
With faculty approval, students may elect to take 6 credits of thesis work
Thesis Option

Choose one:
- CYBR 5230 Wireless Systems Lab
- CYBR 5240 Introduction to Blockchain
- CYBR 5420 Spectrum Management and Policy

Custom
Students electing to take the Custom Depth Area option must first obtain approval from the TCP Program. Under the Custom Option, students must identify a sequence of 5 graduate courses that form a coherent whole that aligns with a student's academic goals and their current, and possibly longer-term, career objectives. Approval of the Custom option is not automatic and requires the student to submit a two-page proposal showing how the selected courses function as a depth area for the student.

The TCP Program is developing some recommended pathways for students who want to use the Custom depth area to specialize in combining knowledge in cybersecurity with other areas such as policy, leadership or management. Some of these pathways will become official depth areas in future years. Students are encouraged to contact the TCP Graduate Program Advisor for information about these pathways if interested.

Interdisciplinary Capstone, Thesis or Portfolio
Students in the MS in TCP program have three options for completing their degree: capstone, thesis or portfolio.

Interdisciplinary Capstone Option
Students work in teams across two semesters to complete an advanced project that builds on their Core and Depth Area courses. Projects are often done in conjunction with industry partners. Topics are selected based on the combined interests of the students, the faculty and external partners such as industry and government. All students are required to take the first course of the sequence below. Most students will then move on to take the second course in the sequence but if a student is enrolled in the Designing for Defense class, they can choose to substitute it for the second capstone course (no petition needed). Thus, the three courses that can be used to meet the Interdisciplinary Capstone requirement are:

<table>
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<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYBR 5700</td>
<td>Graduate Projects I</td>
<td>3</td>
</tr>
<tr>
<td>CYBR 6700</td>
<td>Designing for Defense</td>
<td>3</td>
</tr>
</tbody>
</table>

Thesis Option
With faculty approval, students may elect to take 6 credits of thesis work (CYBR 6950) in place of the Interdisciplinary Capstone requirement. To complete a thesis, the student must get approval from a faculty member who will serve as their thesis advisor and find two additional faculty members who are able to serve on their thesis committee. Students will work with a faculty advisor to complete a thesis on a topic of mutual interest that includes aspects of the three Core areas. The three-member committee must be approved by the TCP Program and by the Graduate School. The student works primarily with the thesis advisor and provides both a written document and arranges a presentation (thesis defense/thesis exam) before the thesis examining committee. Examination Report

Forms must be filed with the TCP Program at least two weeks prior to the date of the defense (exam). Students must be registered during the semester in which they defend their thesis. Additional information, rules, dates and deadlines, and thesis submission requirements can be found on the Graduate School (https://www.colorado.edu/graduateschool/academic-resources/thesis-dissertation-submission/) website.

Portfolio Option
A third capstone option is the portfolio option in which a student may petition the graduate committee to identify two courses that will help them customize their TCP degree in a way that will help them meet their academic and career goals. Students increase the chances of their portfolio petition being approved if the courses they select involve interdisciplinary and/or project-based work as defined by the syllabi from those courses. If a student's portfolio petition is not approved, they must then select either the capstone or thesis option. As a result, students must be submitting their petition for the portfolio option early in their second semester to have time to switch to one of the other two options if denied.

Taking Courses Outside of TCP
Students may take up to six credits of courses from areas outside of TCP to substitute courses within their depth area (both required courses or advanced elective courses). Students must gain approval for these two substitutions prior to completing them by submitting a petition to their graduate program advisor for review/approval by the CS graduate committee. Note: In line with standard practice for the CS graduate committee, courses from the following departments are automatically approved: Linguistics, Business, Geography, Physics, Mathematics, Applied Mathematics/STATS and Information Science.

Dual Degree Programs
The MS in TCP offers dual degree options with the following programs:

- Master of Business Administration (MBA) (https://catalog.colorado.edu/graduate/colleges-schools/business/programs-study/business-administration/business-administration-master-business-administration-mba/#dualdegreeext)

Students pursuing a technology, cybersecurity and policy dual degree must be admitted to both schools/programs under their respective admissions procedures and standards. For more information, visit the program’s Concurrent & Dual Degrees (http://www.colorado.edu/itp/dual-degree/) webpage.