



University of Colorado **Boulder**

2018 Program Review

Interdisciplinary Telecom Program

Academic Review and Planning
Advisory Committee Report

Approved

A handwritten signature in black ink, appearing to read "Paul Moore".

Provost and Executive Vice Chancellor for Academic Affairs. | Date

05/06/2019

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Process Overview

The review of the Interdisciplinary Telecom Program (ITP) was completed in accordance with the 2018 review guidelines. The Academic Review and Planning Advisory Committee (ARPAC) conducts and writes the final reviews of all Boulder campus academic units. ITP completed a self-study in December 2017. An internal review committee of two CU Boulder faculty members from outside of the unit checked the study and issued findings in February 2018. The internal reviewers generally found the report fair and accurate and noted several issues for subsequent exploration by the external reviewers and ARPAC. The external review committee, consisting of two experts within the discipline from outside of the University of Colorado, visited the unit over September 13-14, 2018, reviewed relevant documents, and met with faculty, students, staff, and university administrators. The internal and external reviewers' comments and recommendations are cited at appropriate points throughout the report. This public document reflects the assessment of and recommendations for the Interdisciplinary Telecom Program as approved by ARPAC.

Academic Review and Planning Advisory Committee (ARPAC)

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Academic year 2018-19
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Unit Overview

The campus's standardized description of the unit is available on the web site of the Office of Data Analytics (ODA) at

<https://www.colorado.edu/oda/institutional-research/institutional-level-data/information-department/academic-review-and-planning>.

ODA updates the profile annually in the fall semester. This report cites data posted in October 2017, reflecting the state of the Interdisciplinary Telecom Program (ITP) as of the academic year (AY) 2016-2017.

Personnel and Governance

At the time of its self-study report, ITP counted a resident faculty consisting of a full professor and two assistant professors, four scholars in residence, a senior instructor, and an instructor. The three tenured and tenure-track (TTT) faculty members hold half-time joint appointments with the Department of Computer Science, which also serves as their tenure home; all other instructional faculty are rostered full time in ITP. In academic year (AY) 2016-2017, ITP also employed several instructors and lecturers as adjuncts. The program's web site lists 19 faculty members; however, the online list makes no distinction between program-rostered faculty and those who have appointments elsewhere but who teach ITP classes (or a class).

ITP is led by a faculty director and two associate directors, one of whom is a TTT faculty member and the other a scholar in residence. The ITP resident faculty members unanimously adopted new bylaws in December 2017. These define voting rights as belonging to the resident faculty members.

Research and Scholarship

The ODA ITP data profile provides a measure of the program's TTT faculty members' scholarly output between 2011 and 2017. The ODA count shows ten referred articles and chapters and five conference presentations and papers in that time. The ODA

analysis appears to combine the faculty half-time appointments into the equivalent full-time appointment numbers for analytic purposes.

ODA lists the program's grant expenditures over the last five years as \$552,000, and \$243,000 after allocations.

Undergraduate
Education

ITP does not offer undergraduate courses or degrees. In the self-study, the program expresses the desire to design and teach cybersecurity courses that may be part of the undergraduate curriculum in other College of Engineering and Applied Science (CEAS) units.

Graduate
Education

As of 2018-2019, ITP offered two primary graduate degrees: a master's of science (MS) in interdisciplinary telecommunications and a PhD in telecommunications. The MS also forms part of concurrent bachelor's/master's degrees with the Leeds School of Business (a BA/MS) and with the departments of Applied Mathematics, Computer Science, and Electrical, Computer, and Energy Engineering (all three, BS/MS). In addition, ITP offers its MS as part of dual degree programs with, respectively, the School of Business (MS/MBA), the School of Law (MS/JD), and the Engineering Management Program within CEAS (MS/MS).

As of the fall 2017 campus census, ITP counted 122 master's degree students and 17 doctoral students. Between 2012 and 2017, ITP student enrollments remained essentially flat, increasing by only 1%. Broken out by type over that time, master's program enrollments declined by 8%, while the program's doctoral student numbers increased from five to 17. However, PhD numbers have receded somewhat since fall 2017. The internal review committee counted 14 ITP doctoral

students in February 2018. The CEAS dean reported that, as of fall 2018, the program enrolled 15 doctoral students.

The ITP website describes the curriculum for the MS, the concurrent bachelor's/master's degrees, and the dual graduate degrees. It does not, however, describe the PhD curriculum or related research opportunities and does not indicate a separate application process or distinct requirements. The internal review committee also noted that the website's course descriptions are in some cases ambiguous or incomplete.

The dean's fall 2018 student count showed that only three ITP PhD students had tenured or tenure-track faculty members as advisors; ITP's scholars in residence advised the rest. The external reviewers identified the PhD program as ITP's "most notable weakness" and took the position that "the program needs to be reconsidered and completely rebooted if it is retained."

In 2015, ITP revised its MS curriculum to offer students the opportunity to specialize in one of four tracks:

- Network engineering
- Network security
- Wireless networking
- Telecom strategy and policy

Since the curriculum revision, network engineering has led the other tracks in popularity and network security (otherwise known as "cybersecurity") has experienced the most growth. Wireless networking has seen a sharp enrollment drop; the self-study attributes this to a lack of internship and employment opportunities in this area. The strategy and policy track has had consistently low enrollment, a fact that the self-study attributes to low U.S. student MS program enrollments. However, the

self-study asserts that low enrollments do not endanger the strategy and policy track, since the track's two required courses are also required for students in other tracks.

The internal reviewers had concerns about the academic rigor of the master's program, comparing some its courses unfavorably to community college introductory courses. The internal reviewers also queried whether and how ITP had studied the effectiveness of the MS program's tracks.

As of academic year 2018-19, the track formulation began to change when ITP made its emphasis on cybersecurity more explicit as part of transitioning its name to the Technology, Cybersecurity and Policy (TCP) Program, a change that was submitted for approval by the University of Colorado Board of Regents in spring 2019. The ITP website now promotes cybersecurity as the program's focus to prospective students, including a self-description that reads "Earn a master's degree in cybersecurity with applied, hands-on experience in network engineering, policy and law, and entrepreneurship. ITP students develop skills in large-scale network management and administration, wireless systems, cyber-physical systems, and become familiar with key policies and regulations that impact cybersecurity and privacy." The external reviewers concluded that the program's constituents were all supportive of this new emphasis.

The program's self-study and the CU Boulder course catalog also show ITP as offering a professional master's of science degree in telecommunications (MST). This degree forms part of a dual professional master's/juris doctor degree with the School of Law (MST/JD). However, neither ITP nor Law publicize the MST degree online, and neither unit seems to accept MST degree applicants. Finally, subsequent to its self-study report,

as part of its official name change proposal, the program indicated that it plans to evolve its network engineering-focused MS track into a second MST degree.

In January 2018, the internal reviewers conducted a survey of ITP student satisfaction. Of 137 students enrolled in ITP degree programs, 102 responded (a participation rate of 74%). On the whole, students assessed the program's structure and teaching positively. However, several students described ITP's curricular requirements as vague or shifting; with one student calling out the PhD program in particular for these shortfalls. The course workload, and in particular ITP's non-technical course requirements, left a number of students dissatisfied. Other students, however, praised the range of program requirements and described the workload as heavy but doable.

Space
and
Infrastructure

The College of Engineering and Applied Science has assigned ITP 11 offices. This space distribution includes an office shared by two staff members. ITP faculty members have offices in the Engineering Center, and the college has assigned ITP space for adjunct faculty to hold office hours in the Discovery Learning Center. The self-study describes the current office space allocation as inadequate and reports that larger engineering units have overshadowed ITP's attempts to gain additional space. The self-study also contends that it is inconvenient for faculty to move back and forth from the Engineering Center to the Discovery Learning Center, a distance of some 0.2 miles across a parking lot.

According to the self-study, ITP's laboratory facilities were extensively remodeled in 2015-2017. These updates addressed a network engineering-focused telecom lab, a network security operations lab (both in the Engineering Center), and a wireless lab (in the Discovery Learning Center). The external reviewers

singled out the ITP telecom lab for praise, calling it a “stellar” training center for network engineering students and professionals and the basis for the valuable, hands-on training that is a hallmark of the program’s offerings. However, lab size limits effectively limit the program’s future enrollment potential, the self-study notes.

Staff The program employs four staff members: an academic services assistant director, a graduate program advisor, a corporate outreach manager, and an administrative assistant. The self-study indicated that the staffing level is adequate to meet the program’s current needs. The self-study also assessed professional development as an opportunity the unit wishes to make available for its staff members.

International Enrollments In recent years, international students have comprised a growing majority of ITP’s student body, and a large percent of these have come from India. This is particularly true of the master’s degree program, which accounts for about 90% of ITP’s enrollments.

A tally of ITP international student enrollments as a percent of total ITP enrollments over the most recent six years with available data breaks down as follows:

2011: 61%

2012: 67%

2013: 72%

2014: 77%

2015: 85%

2016: 88%

Of the 54 international students who matriculated in fall 2017, 48 were from India, while six were from four other countries (China, Kenya, South Korea, and Italy).

ITP's self-study describes a philosophy of "culturally responsive teaching" that recognizes the program's strong appeal to international students. However, the self-study also acknowledges the potential risk to the program's long-term viability from having international students represent the overwhelming majority of enrollments. The program has proposed a pivot, writing in the self-study, "We are admittedly too internationally biased, especially with regards to India, and need to improve our recruitment and admissions of top-caliber domestic students reflecting the diversity of our state of Colorado."

Climate
and
Inclusive Excellence

ITP has not yet submitted an inclusive excellence narrative to the Office of Diversity, Equity and Community Engagement.

The internal reviewers described the students they interviewed as "uniformly positive" about the program. What criticisms the students expressed seemed limited to an observation that some requirements, such as obliging international students to take United States telecommunications policy courses, appeared superfluous. It is important to note that the internal review committee's interviews involved only the program's PhD students, whereas master's students account for approximately 90% of ITP enrollments.

A more broadly scoped (but still limited) accounting of the unit's climate occurred in September 2017 when ARPAC staff members conducted climate surveys addressed to the program's faculty members and graduate students holding teaching or research appointments (meaning, again, PhD students). The ARPAC survey did not address ITP staff members as they numbered too few and their responses might have proved self-revealing.

Overall, the survey results suggested a welcoming unit climate. Faculty member responses indicated a positive assessment of teaching and research conditions. Graduate student responses described a strong sense of respect and community.

Of the 17 ITP affiliated faculty members invited to participate in the September 2017 climate survey 12 responded (a participation rate of 71%).

The surveyed ITP faculty members overwhelmingly “agreed” or “strongly agreed” that the program director, colleagues, staff members, and students treated them with respect. Related prompts registered between 91% - 100% agreement.

Ninety-one percent of responding faculty “agreed” or “strongly agreed” that ITP has a positive social and professional climate for faculty members across all ranks. Eighty two percent “disagreed” or “strongly disagreed” with the statement that other faculty members and ITP graduate students “say things or behave in ways that humiliate or intimidate.” Seventy three percent “disagreed” or “strongly disagreed” with the same statement as applied to their staff member interactions. One hundred percent “agreed” or “strongly agreed” that ITP faculty members are friendly and supportive of each other. Ninety-one percent “agreed” or “strongly agreed” to feeling valued as an ITP member. Despite these positive indicators, the prompt “faculty incivility is having a disruptive effect on the program” registered agreement from 18% of the program’s participating faculty members; likewise, 27% agreed with the prompt “I feel excluded from informal networks in ITP”.

Among the 12 graduate student appointees to whom the September 2017 survey was addressed, 10 responded (83%).

As with the faculty member responses, the program's graduate students generally registered replies indicating a good environment. All students responded "strongly agreed" with separate prompts asking if their graduate advisor, other program faculty members, and program staff members treated them respectfully. In addition, all students either "agreed" or "strongly agreed" that ITP graduate students treat each other respectfully.

All the participating graduate students "agreed" or "strongly agreed" that the ITP social and professional climate is a positive one for students of color, for those from other countries, or for those of different religious views. Eighty percent "agreed" or "strongly agreed" that ITP women graduate students experience a positive social and professional climate (the other 20% responded "Don't Know/NA"). The survey results suggested less understanding for other categories, including when students were asked to gauge the social and professional climate for students of different sexual orientations (50% strongly agreed it is positive, but 50% responded "Don't Know/NA") and for students of different political affiliations (60% "strongly agreed" that all affiliations experience a positive climate, but 20% disagreed and 10% responded "Don't Know/NA").

One hundred percent of participating students "agreed" or "strongly agreed" that they feel valued as an ITP student and that the program's students treat each other in friendly and supportive ways. An identical total agreed that ITP faculty members are friendly toward and supportive of graduate students. Almost all students (90%) "agreed" or "strongly agreed" that ITP has a positive sense of community and that the faculty members are friendly and supportive of one another. A high number of survey responses (80%) "strongly disagreed"

that faculty incivility disrupts program functioning. Likewise, 80% “disagreed” or “strongly disagreed” that “one or more ITP graduate students say things or behave in ways that humiliate or intimidate other graduate students,” that “graduate student incivility is having a disruptive effect on program functioning,” or that they feel “excluded from informal networks in my program.”

One potentially troubling finding was that 20% of responding students felt that “one or more ITP faculty members say things or behave in ways that humiliate or intimidate graduate students.”

Whatever the significance of these data, they are also subject to the caveats that the program’s current full-time faculty members include no women. Data on the percentage of total resident faculty who identify as women are not available from ODA.

The ITP student gender distribution also leans heavily toward men. Between 2006 and 2014 the percentage of women students never exceeded 21% and dropped as low as 11%. The 2015 and 2016 classes saw these numbers improve, reaching 27% and 33% women students, respectively.

As of fall 2018, none of the program’s TTT faculty members identified as belonging to an underrepresented minority group. Data on the full cadre of resident faculty who identify as members of underrepresented minority groups are not available from ODA. ODA data as of fall 2018 show that 26% of students identified as members of underrepresented minorities.

The self-study states the program’s goal is “to have faculty, staff, and student populations that reflect diversity of our state.

As opportunities present themselves to hire new faculty and staff, ITP will address any shortcomings in diversity and inclusiveness to the best of its ability.”

Budget Upon gaining “enterprise status” from the University of Colorado Board of Regents in 2003, ITP became self-supporting, meaning that it received no general fund monies and instead depended entirely on its own tuition revenues to pay for operating costs.

Under this arrangement, the program established a partnership with the College of Engineering and Applied Science whereby students paid tuition rates for a traditional master’s program but the program and the college, contrary to traditional master’s program models, had a revenue-sharing agreement. The college took receipt of \$300 for every student credit hour generated by ITP. After the program had paid the college for its operating expenses, the excess revenues went into a reserve fund capped at the equivalent of six months of the program’s operating budget. ITP and the college split 50/50 any remaining revenues beyond the cap. This revenue share arrangement between the program and the dean is essentially the same as that used by engineering professional master’s programs.

Over the past three fiscal years, the surplus revenues over expenses totaled as follows:

FY2015
Revenue: \$2.245 million
Expenses: \$1.707 million

FY2016
Revenue: \$3.494 million
Expenses: \$1.927 million

FY2017
Revenues: \$3.593 million
Expenses: \$2.693 million

These totals represent gross revenue over expense margins of 24%, 45%, and 25%, respectively. As of November 2017, ITP's reserve fund stood at just over \$2 million.

After 2017, following on the campus chief financial officer's and dean's direction, ITP changed its budget model. The campus decision to consolidate all revenue-sharing arrangements into a single professional master's model drove this change. The transition involved switching the master's program from charging the traditional graduate program rate to the professional master's rate, while also continuing to use the revenue share arrangement for the master's program that applies to engineering professional master's programs. In doing so, ITP tuition revenues dropped 25%. Rather than continuing as a self-supporting enterprise, the program now receives general fund monies.

Past Reviews

The predecessor committee to ARPAC, the Program Review Panel (PRP), reviewed ITP in 2006. PRP's recommendations asked ITP to explore ways to increase its enrollments; to align its curriculum with student needs; and to strengthen its ties to interested faculty in the schools and colleges. The program attended to these matters in the years since, but work also remains to be done on these fronts, as described elsewhere in this report.

Campus Context

Interdisciplinarity is at the heart of ITP's mission and identity. The program's tenure stream dual-appointed faculty members conduct research that is inherently interdisciplinary. As described previously, the program serves students in multiple schools, colleges, and departments through its dual degrees and interdisciplinary certificates. The certificates in computer and network security, network architecture, telecom policy and strategy, and wireless networks and technology are especially attractive to engineering students. According to the self-study, ITP has begun discussions with the Leeds School of Business to provide several courses as part of a new security analytics track within the Leeds business analytics graduate degree program.

The internal review committee recommended that the program, in addition to its current partners, build ties with the ATLAS Institute and with the College of Media, Communication and Information.

The self-study cautions that ITP's interdisciplinary curricular organization "easily lead to confusion and misunderstanding of the program niche without careful communications... ITP has been able to chart a successful course that has complemented the other departments in [CEAS] to date, but it is... important to recognize the elements of ITP's educational mission that keep its degree focus unique to the Program."

Disciplinary Context

According to the self-study, ITP, founded in 1971, was the first telecommunications program in the United States. Since that time, it has led its discipline in enrolling students who do not hold math, science, or engineering undergraduate degrees. As a result, ITP has few disciplinary comparators. National and international rankings of programs are not available; nor are Academic Analytics data. However, ITP has served as a charter member of the International Telecommunications Education and Research Association. Among this group of eighteen institutions, many have looked to ITP as a model in terms of mission and organization. ITP faculty members and graduate students present their work every year at the Telecommunications Policy Research Conference, which, according to the self-study, is currently the world's premier telecommunications policy discussion forum.

ITP's extensive ties to, and work with, industry partners constitute another aspect of its disciplinary success. ITP maintains several industry advisory committees tasked with promoting communication between and shared interests among the program and industry professionals and companies. In 2015, the program created a staff position whose duties include corporate communications and industry outreach. Graduate placements demonstrate the success of these ties. According to the self-study, in 2016 98% of ITP MS and PhD students secured a job within three months of graduating. The self-study does not differentiate between MS graduates and PhD graduates in terms of the types of jobs they typically land after completing their degrees.

Analysis

Over ITP's nearly 50-year history, the program has acquired a national and international reputation for its aforementioned interdisciplinary partnerships, its telecommunications industry ties, and the success of its student placements. The program has in many respects evolved with the industry and shifted focus to address new needs. Repositioned as of 2019 as the Technology, Cybersecurity and Policy (TCP) Program, the unit is about to embark on another opportunity to present itself to prospective students as a place to gain relevant training. The program is financially self-sufficient and a campus revenue source.

In addition to the program's strengths, however, it faces significant challenges as it attempts to reposition itself. Strategic decisions, such as the shift to cybersecurity, need to be transparent and based on a recognizable consensus among the program's constituencies, including students and industry contacts. The internal reviewers and ARPAC alike noted in the self-study a lack of transparency regarding who decides the program's future, and how they decide. The origin of the program's current strategic shift to a cybersecurity focus is unclear. Is that plan a result of collaboration between, or at least input from, full-time faculty, associated university faculty, adjuncts, students, and alumni? Did the cybersecurity shift represent a consensus view among the relevant stakeholders? It may be the case that all stakeholders were consulted, but the self-study is silent on this issue. ARPAC urges the program to identify and consult its constituent base in future strategic planning and in any development of or significant changes in its plans and curricula.

ARPAC congratulates ITP on strategically positioning its degree and certificate programs to attend to student and workplace needs. The program's continued health depends on its

continuing to ground such decisions in a stakeholder consensus.

The program's students appear to express satisfaction with the practical, hands-on, laboratory-intensive structure of their instruction and with the quality of their instruction and their education overall. As noted, the student surveys described some concerns about the desirability or relevance of certain curricular obligations, such as requiring courses on U.S. telecommunications policy. In a program dominated by international students, such criticisms may be a product of student demographics, but nevertheless they are ones that ITP should heed.

The program's current dependence on international students raises serious strategic concerns. If changes in national immigration policies occur, especially to the extent that these might affect international students, the source of the vast majority of the program's revenue could be seriously damaged.

Another crucial area in need of attention is the ITP doctoral program. The external reviewers' concern that the PhD program is ITP's "most notable weakness" and their position that "the program needs to be reconsidered and completely rebooted if it is retained" speak to the urgency of the situation. Although the reviewers did not give any specific reasons for reaching this conclusion, one possible interpretation for their concern is that it may be difficult to maintain a healthy doctoral program in a unit that employs only three TTT faculty (and this only on half-time appointments). As previously noted, 12 of the 15 PhD students enrolled as of fall 2018 did not have a TTT faculty member as their primary advisor. The internal reviewers note that those advising doctoral students may not have a doctoral

degree themselves. ARPAC considers this situation to be contrary to the norms and expectations of doctoral education.

It is also noteworthy that the PhD program is barely mentioned on the program's website, and that its structure, opportunities, application requirements, and purpose are nowhere distinguished from those of the MS program. It is essential that the program clarify the nature, purpose, and integrity of the PhD program both to itself, and to potential applicants as well as to current students.

Space
and
Infrastructure

ITP's top-notch laboratory facilities are crucial to the program's reputation for practical excellence but require costly and regular maintenance and replacement. The program's self-study also mentions the need to secure permanent lab space dedicated to cybersecurity research.

Office space for the existing full-time faculty and staff may be only slightly inadequate in its current state, however, the current allocation will likely not stretch to accommodate additional faculty or staff hires. The program's printer is located in a separate building from the one housing ITP faculty and staff offices. A shortage of faculty and staff common areas also creates problems, including a lack of space for basic amenities such as a microwave, refrigerator, and office supply storage. The self-study mentions a lack of adequate office spaces for adjuncts when they meet with students and for visiting scholars.

Staff

ITP has a small staff that has recently undergone significant turnover. While the program is satisfied with the current numbers and organization of its staff positions, careful attention to adequate staff training and professional development is called for as the program transitions to its new focus.

The program must make gender diversity a priority among all constituent groups. Whether it is establishing a women's student organization, the lack of which the external reviewers noted, or taking steps necessary to bring women into faculty membership or into the degree programs, more must be done. Indeed, whatever good can be inferred about the program's climate, which this report has noted, serves only as an asterisk to a larger concern about a lack of women's participation.

None of ITP's nine resident faculty members identifies as a woman. This represents an unacceptable gender imbalance that the program and college must rectify. The program also has a less severe, and apparently improving, student gender imbalance, and should seek to build on recent improvements in this area.

The program has a small number of U.S. students, an imbalance which has become increasingly striking in recent years. Along with recruiting more women faculty members, recruiting U.S. students should be high ITP priorities, and these should be reflected in the program's financial commitments going forward. The unit's small cadre of U.S. students indicate that ITP has a good record of attracting students from underrepresented U.S. minority groups, and increased enrollment of U.S. students could help build on these achievements.

The program has not yet submitted an inclusive excellence plan to the Office of Diversity, Equity and Community Engagement, even though its self-study includes a detailed discussion of inclusive excellence.

Recommendations

The members of ARPAC address the following recommendations to the Interdisciplinary Telecom Program (ITP) and to the offices of responsible administrators:

To the Unit:

1. Continue the strategic planning process begun in the self-study. Strategic planning should address the program's new cybersecurity focus and the significance of the change on the program's interdisciplinary profile. Going forward, make sure that all constituent groups are involved in and informed about strategic planning and program changes.
2. Undertake a detailed review of the PhD component of ITP. That review should consider terminating or fundamentally restructuring the doctoral program. If the doctoral program is to continue, clarify and publicize its purpose and curriculum and set benchmarks for expansion and success.
3. Focus on recruiting more U.S. students and on diversifying the program's international recruitment scope. The dependence of the program on tuition from international students in general and students from one country in particular leaves it vulnerable to external political forces.
4. Address the gender imbalance in regard to the program's faculty, in terms of both the voting faculty and adjunct faculty.
5. Submit an inclusive excellence narrative to the Office of Diversity, Equity and Student Engagement.
6. Revise ITP's website to have more accurate and transparent information. The website should clearly distinguish between resident faculty members and adjuncts. The website should also identify, describe, and distinguish among the

program's MS, PhD, and concurrent and dual degrees, as well as identifying and describing its certificates.

7. Ensure that all ITP courses are up to the level of academic rigor appropriate for a graduate-level program at the University of Colorado Boulder.

To the
CEAS Dean:

8. Support ITP's transformation to a model in which the program is primarily focused on cybersecurity and network engineering.

9. Assist the program in undertaking a detailed review of the PhD component of ITP. That review should consider terminating or fundamentally restricting doctoral enrollments. If the doctoral program is to continue, assist the program in clarifying its purpose and curriculum and in setting benchmarks for expansion and success.

10. Ensure that going forward, PhD students have advisers who are TTT faculty members.

11. Address the radical gender imbalance in regard to the program's faculty, both in terms of the voting faculty and other associated faculty. Require making women faculty recruitment a priority.

12. Give due consideration to ITP's requests for additional space and infrastructure improvements.

Required Follow-Up

The Technology, Cybersecurity and Policy Program director (formerly the ITP director) shall report annually on the first of April for a period of three years following the year of the receipt of this report (i.e., April 1st of 2020, 2021, and 2022) to the dean of the College of Engineering and Applied Science and to the provost on the implementation of these recommendations. Likewise, the dean shall report annually on the first of May to the provost on the implementation of recommendations addressed to the college. The provost, as part of the review reforms, has agreed to respond annually to all outstanding matters under their purview arising from this review year. All official responses will be posted online.