

Communication Across the Campus at CSM 2015-2016

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The Ad Hoc Communication Across Campus (CxC) Committee was tasked with investigating and making recommendations for CxC at CSM. The purpose of this report is to solicit feedback from CSM faculty and administrators on the committee's preliminary recommendations. After providing a brief historical overview of background on past and present CSM communication initiatives and their catalysts, this report proposes programmatic action to support communication training across the campus. Three potential paths forward are offered that require differing levels of institutional commitment. None of the models (pp. 9-12) proposed advocates for an increase in credit hours in any department or division.

Background on Communication at CSM

Interest in communication at CSM is not new. As far back as the 1994 CSM Alumni Survey, one recurring theme from former graduates was that alumni thought they had been well prepared by CSM for the technical challenges they faced in industry. By contrast, alumni did not always report being as well prepared to meet the professional communication challenges they faced in their respective engineering workplaces; some alumni reported watching others promoted before them due to less developed communication capacities. Such capacities were sometimes grouped with other lacking professional skills, such as teamwork. Industry perspectives confirmed that CSM graduates were seen as highly competent technically, but less so in terms of professional characteristics like communication and teamwork.

Local industry perspectives aligned with a wider sample of industry perspectives in terms of rankings of key skills that engineering firms look for in new hires. When over 1,600 employers of new engineering hires were surveyed and asked to rank the previous 11 ABET Criterion 3 Program Outcomes, the one ranked at the top was the ability to *communicate effectively*, as noted in Figure 1 (Lattuca, Terenzini, & Volkwein, 2006). Such perspectives make sense in light of the quantity of an average workday that engineers spend communicating, and the financial costs involved in miscommunication. Studies on engineers' workplace communication requirements are telling: engineers devote 20-40% of their day to writing, but that percentage climbs as engineers move up the ladder. Engineers in mid-management positions write between

50-70% of a day on average, while senior managers write between 70-95% if their day (Silyn-Roberts, 1998; Kreth, 2000). Although those surveys focused on writing, engineers engage in multiple other communication modes as well.

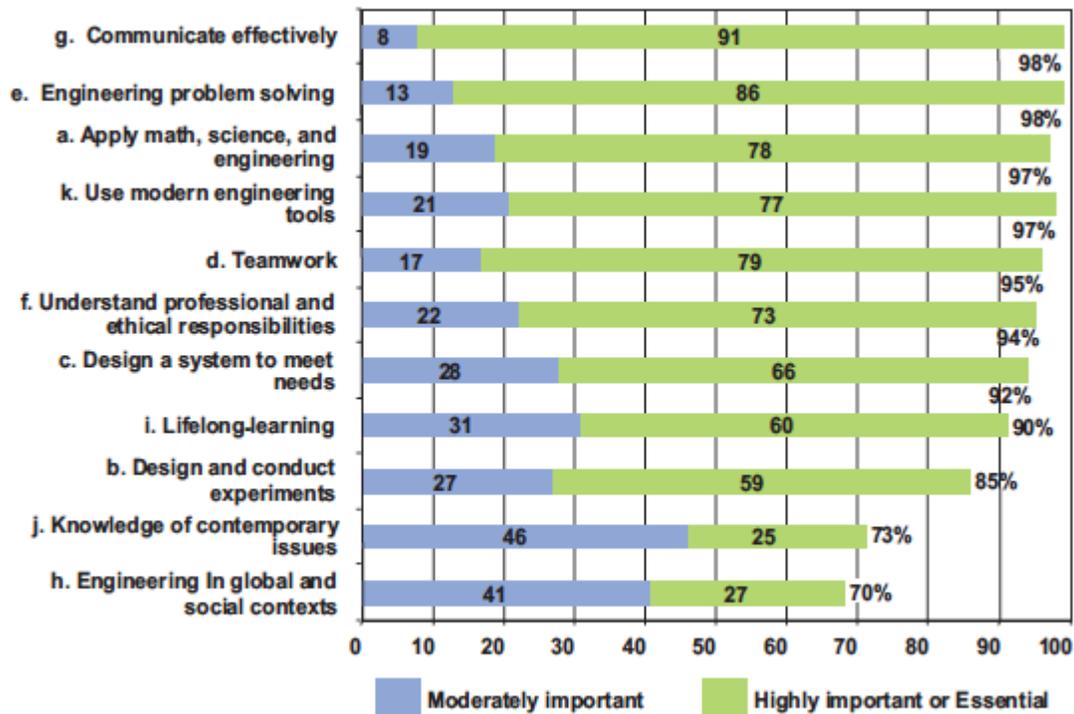


Figure 1: Employers' Rankings of ABET a-k Outcomes for New Engineering Hires (Lattuca et al., 2006, p. 11)

If communication is a crucial part of the engineering workplace—in terms of written, oral, listening, visual, nonverbal, and electronic communication—what role does it play in the engineering curriculum? In the mid-1990s, then McBride Honors Program Director Barbara Olds surveyed all 11 undergraduate-degree granting departments and divisions at CSM, asking faculty 1) the degree to which they were satisfied that B.S. graduates in their department or division were prepared for the demands of workplace communication and 2) what, if anything, should occur to ensure such preparation met or exceeded departmental and institutional standards and expectations.

This led to bottom-up faculty support for a Writing Across the Curriculum (WAC) Program, wherein teaching writing in various contexts was seen as a responsibility shared by all faculty, a notion embraced by the CSM administration at the time. The focus on WAC (and not CxC) stemmed from the perception that writing was the weakest link in the communication chain. The WAC Committee, formed in early 1998 as a subcommittee of Undergraduate Council, was charged with integrating writing within the disciplines; that committee included one faculty member from LAIS, Chemical Engineering, Metallurgical and Materials Engineering, and two from Engineering. Rather than “offshore” writing to LAIS courses, which engineering and science students generally did not perceive to be integral to their disciplinary preparation, writing

was to be integrated in the very courses that such students saw as critical to their formation as engineers and applied scientists: upper-division technical courses in the major.

The WAC Committee gathered feedback from faculty across campus, which significantly shaped the WAC program: faculty indicated a desire for consistent practice across all four undergraduate years. In terms of core courses, writing in year one was buffeted by NHV and EPICS I and in year two, to a lesser degree, by Human Systems and EPICS II. However, today EPICS II is only required for about 40% of CSM undergraduate students. At the upper-division level, each undergraduate-degree-granting department/division identified four courses as writing-intensive, generally two at the junior and two at the senior level. Rather than a rigid, one-size-fits-all definition of writing-intensive courses, faculty indicated a strong preference for flexibility, since writing was a natural fit in some courses (e.g., Senior Capstone Design), while it required more judicious integration in others (e.g., junior-level lab courses). As a result, the guideline passed by Undergraduate Council in April 1999 stipulated that the four courses would add up to a minimum word count of 15,000; assuming 300 words/page, this 50 pages of text would be distributed across the four courses in a manner deemed appropriate by each department/division. Each department/division liaison to the WAC Committee conveyed which four courses were writing intensive, and annual faculty workshops were held from 1998 to 2011 to provide faculty with techniques for integrating writing in technical courses. This faculty desire to integrate written practice across all four years aligned with the literature on how people learn and improve in writing: writing skills develop slowly over time but atrophy quickly via disuse (Lindemann, 1995).

Since 2011, no WAC Committee has met regularly nor have WAC faculty workshops occurred, as the original WAC Committee members have retired or stepped down and have not been replaced. In 2011, the WAC Committee wrote a lengthy report on WAC called the WAC Futures Report, envisioning diverse paths forward for WAC. Of all the administrators sent the report (CSM President, Provost, etc.), none responded to its content nor its recommendations.

As in 1997, faculty have been tasked with making recommendations for a communication program. The prevailing questions remain largely unchanged:

- Given the crucial role communication plays in engineering and science workplaces, what communication components should be supported, bolstered, or constructed to meet CSM expectations for graduates in our various B.S. degree programs?
- In a CxC Program, what dimensions of communication should be (de)emphasized or omitted?
- What role should technical and other faculty play in integrating communication across the disciplines?
- What CxC models might be well suited to the exigencies of CSM?

Current Communication-Related Needs at CSM

Current communication-related needs can be categorized in terms of feedback from employers, alumni, faculty, and students.

Employers of CSM Graduates

Employers of our graduates give recurring forms of feedback. Mines students are often seen as highly competent in the technical domains, but not in communicative ones, limiting their path to promotion and additional technical opportunities. In the Mines Career Center's Fall 2014 and Spring 2015 surveys of employers visiting Career Day, 90% ranked as "important" or "very important" the following skills: Reading, Writing, Public Speaking, and 80% ranked Group Communication as "important" or "very important."

Broader surveys of employers reveal similar results. For instance, John Challenger, CEO of the job placement consultancy Challenger, Gray, & Christmas, reported in 2013 on a Society of Human Resources Executives survey that identified basic writing as the skill most lacking in college graduates. In the article, Challenger writes, "Those who concentrate on courses related to math, science, engineering and technology, will probably have the widest array of options upon graduation. However, it is vital not to overlook critical coursework in writing, public speaking and courses that sharpen your critical thinking skills. Employers across the country consistently lament the lack of writing and communication skills that are essential in any profession one might pursue" (Challenger, 2013).

CSM Alumni

CSM alumni who volunteer to serve as guest speakers in classes or to present workshops frequently emphasize the importance of communication skills in the workplace. Some alumni comment on the need for required technical writing and oral communication classes. Director of Assessment Kay Schneider has indicated that no widespread survey data on alumni perspectives on communication (and other) skills is available.

However, a survey of 161 CSM Chemical and Biological Engineering alumni who graduated between 2001-2010 reveals the importance of communication skills in their careers and their impressions of their training at CSM. Over 60% of respondents ranked oral and written communications skills as 'Vital' in their careers. Those two questions received a higher 'Vital' score than any other question in the survey, which primarily asked questions about various technical aspects of the curriculum. Interestingly, ~70% of respondents felt that the level of instruction of written and oral communication skills was 'just right,' although a significant fraction of ~20% found the level insufficient. At the time of graduation, ~70% of respondents rated their ability to prepare and effectively deliver oral presentations as Good to Excellent, and ~80% rated their ability to write clearly and edit the work of others as Good to Excellent.

CSM Faculty

At present, CSM faculty requests go largely unmet due to limited faculty resources. This section focuses on just a few examples of such needs and the reasons why such legitimate expectations cannot be met.

Between once a month and once a week, the Writing Center Coordinator receives requests from faculty members from all colleges and departments to provide instructional support in communication for their classes; just as a few examples, Wendy Wempe (Research Assistant Professor, Petroleum Engineering) asked for assistance designing a course in professional communication for graduate students, Jered Dean (Teaching Associate Professor, Mechanical Engineering) requested advice on developing rubrics for Senior Design, Allison Caster (Teaching Assistant Professor, Chemistry) inquired about assistance with undergraduate lab reports. A more extensive list of examples of faculty requests appears in Appendix A. Unfortunately, due to insufficient faculty resources currently available, such legitimate requests cannot be supported.

Faculty have contributed creative ideas, such as the ones that emerged from the 2015 Faculty Conference—creating an undergraduate research journal or sponsoring a writing award. However, these initiatives, like those above, require faculty capacity. Also, focusing simply on LAIS needs is neither appropriate nor sufficient. Anecdotal evidence from non-LAIS faculty suggests a reluctance of faculty to meaningfully engage in developing communication skills in their students when this is not being valued, in a meaningful way, by the campus. To better understand current faculty views, a list of proposed survey questions appears in Appendix B.

CSM Students

Students regularly express surprise at Mines' sparse communication course offerings, particularly for Technical Writing/Communication. (The LAIS proposal for precisely such a required course was rejected by Undergraduate Council in 1995-96.) In the December 2015 meeting of the Undergraduate Student Government, nearly all students present expressed a desire for some kind of communication-related track that they could complete while obtaining their degrees. There is also a high demand for LAIS classes in Science Communication and Creative Writing. Also, in the last three years, Writing Center appointments have increased by 400%, suggesting that graduate and undergraduate students alike seek opportunities for improving communication skills (57% of Writing Center appointments are utilized by undergraduates). In Fall 2015, over 1,000 members of the campus community utilized some Writing Center service: one-on-one writing tutoring at the Center or in CASA, or attending workshops and presentations.

Learning Outcomes

When a student receives an undergraduate degree from CSM, it should come with some assurance that that student has met minimal communication learning outcomes. Yet such outcomes place the bar low and beg another question: in terms of our students' communication capacities, to what can we aspire? This section articulates both an aspirational ideal as well as a set of minimum standards.

A CSM degree should send a message to future employers and taxpayers that CSM alumni not only have the technical but also the communicative capacities to add significant value to their respective workplaces and to civic life. This aspiration aligns with the [Profile of a CSM Graduate](#), which states that graduates from CSM “must have the skills to communicate information, concepts and ideas effectively orally, in writing and graphically.” The aspiration also advances the [CSM Strategic Plan](#), which aims at a “4-year graduation rate of 60% and 6-year rate of 85% while still maintain Mines’ hallmark *commitment to quality, rigor and excellence*” (emphasis added).

Examples of Aspirational Learning Outcomes

Quality, rigor, and excellence are promoted when graduates are provided with the Strategic Plan’s goal of enhanced “opportunities...to develop effective communication skills as a complement to strong content expertise,” an issue explored in more detail below. Thus, the vision of a CxC Program should be aimed at achieving ambitious learning outcomes. Specifically, when students earn an undergraduate degree, they should know and be able to enact certain skills and abilities. Upon completion of a B.S., students should have

- Participated in identified courses spread across the undergraduate curriculum that ensure communication is not an isolated, sporadic occurrence but integral to promoting learning across the curriculum.
- Learned best practices for active listening and receiving incoming communication
- Received guided practice in disciplinary (especially written) communication in a context involving iterative feedback-and-revision loops
- Received guided practice at giving both technical and non-technical presentations so they can
 - Effectively communicate to a wide range of technical and nontechnical readers/audiences utilizing a combination of words, graphics, and other media
 - Write and speak in a jargon-free language that is clear, concise, and accessible.

How do CSM students reach those learning outcomes? At present, fewer structures are in place than in the past for CSM students to encounter opportunities to learn how members of their respective fields communicate. Similarly, fewer resources exist for CSM faculty to integrate communication in ways that maximizes student benefits:

Technical content learning: Writing is part of several high-impact practices that research has linked to student learning. These practices include writing-intensive courses, frequent higher-order exams and assignments, prompt feedback on student work, tutoring, and supplemental instruction (Kuh, Schneider, & Association of American Colleges and Universities, 2008).

Problem solving and critical thinking: Communication in the classroom is inseparable from demonstrations of “critical thinking, information literacy, problem solving, quantitative reasoning, and other skills” (Walvoord, 2014, p. 1).

Disciplinary identity: Undergraduates at CSM can gain a deeper understanding of discipline-specific writing conventions and techniques. Those with more confidence in their communication capacities are more likely to effectively communicate technical and nontechnical ideas to audiences outside and within their fields. The ability to communicate like peers within one’s field bolsters a sense of membership and legitimacy in one’s profession (Bazerman et al., 2005) and is achieved via iterative loops involving practice, feedback, and revision (Williams & Colomb, 2007).

Student retention: Writing is an important skill for students' academic success in college, which in turn affects retention (Habley, Bloom, & Robbins, 2012).

Clearly, CxC and engineering/science share common goals. For instance, engineering design has been defined as “the process of devising a system, component, or process to meet desired needs.... Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing, and evaluation. Central to the process are the essential and complementary roles of synthesis and analysis” (Lynn, 1977, p. 150). One of the primary purposes of communication activities is to promote synthesis, analysis, and evaluation skills. Also, courses in the engineering sciences focus on fostering improved capacities to calculate and solve problems, and communication facilitates open-ended problem solving and critical thinking (see also Bean, 2011). Among other assignments, CSM engineering instructors have asked students to write descriptions of *how* they solved problems, revealing common misconceptions and theoretical or practical misunderstandings.

Learning to communicate in engineering and science involves learning to persuade using data, and recognizing why data do not speak for themselves (Mathison, 2000; Leydens, 2008). As MIT researchers have pointed out, learning to communicate in engineering and science accentuates critical distinctions: between presenting reader-(un)friendly ideas in writing and visually, between raw research data and the eventual evidence used in papers or presentations, between data and the assumptions behind the data, and between merely presenting data and framing it based on how it is likely to be received by a given audience (Poe, Lerner, & Craig, 2010).

Although most engineering faculty are familiar with communication as a vehicle for *demonstrating* student learning, fewer faculty are aware of the advantages of communication as

a vehicle to *promote* student learning, also known as the difference between writing to communicate and writing to learn:

Writing to communicate...means writing to accomplish something, to inform, instruct, or persuade. . . . Writing to learn is different. We write to ourselves as well as talk with others to objectify our perceptions of reality; the primary function of this "expressive" language is not to communicate, but to order and represent experience to our own understanding. In this sense language provides us with a unique way of knowing and becomes a tool for discovering, for shaping meaning, and for reaching understanding. (Fulwiler & Young, 1982, p. x)

This concept applies not only to writing, and can also be reconceived as communicating to communicate and communicating to learn. Since faculty are the conduits for using communication to both promote improved communication capacities and learning, a successful CxC Program should also identify clear outcomes for faculty, such as providing evidence that

- All faculty and students share responsibility for improvement in student writing (sample indicators: number of communication-intensive courses, number of pages written per student, number of presentations per student, learning outcomes resulting from such communication).
- Faculty can identify connections between communication and learning and distinguish diverse purposes for communication (sample indicators: faculty communication workshop evaluations).
- Faculty who identify innovative discipline-specific and interdisciplinary mechanisms that promote student learning via communication receive incentives and rewards, particularly for dissemination of such innovation (sample indicators: number of grants awarded for pedagogical innovation, number of presentations given to other faculty).

The above foundational CxC principles and desired outcomes have informed the recommendations below. Also, Appendix C features some of the programs our committee consulted while researching a multitude of CxC approaches.

Recommendations: Three Models

There are multiple, feasible approaches to enacting and sustaining the CxC initiative. Three possible models are described here that require diverse levels of institutional support, at what we are calling the Gold, Silver, and Bronze levels. The more robust the model chosen, the better and more rapidly the CxC Program can meet the needs of the campus community.

Gold Model

The Gold Model proposes creation of a robust CxC Program separate from yet complementary to the Writing Center efforts. Focused on providing pedagogical and assessment resources for faculty, the Gold Model features five disciplinary and cross-disciplinary components:

1. *CxC Director* (1FTE, Rank TBA—Teaching Faculty, Tenure Line, or College-wide Administrative Faculty), will work with stakeholders across campus to develop communication-related outcomes for Mines students aligned with the goals stated in the strategic plan, and create an assessment program for these outcomes, and be provided with resources to enact programmatic initiatives including
 - a. Faculty Fellows, including their hiring, supervision, and coordination of activities (see #2).
 - b. A program that offers financial support and one-on-one guidance for faculty willing to redesign courses and requires that faculty present/share process with next generation of fellows, perhaps in conjunction with the Trefny Innovative Instruction Center (TI²C).
 - c. Summer faculty workshops co-directed by Faculty Fellows for CxC course planning and design with grants/awards offered for faculty who implement and disseminate designs.
 - d. A year-long workshop series tailored to faculty needs that would help establish a common language for teaching communication across the curriculum.
 - e. Writing-Intensive course designation program with faculty support for course development and delivery, perhaps in collaboration with TI²C. Faculty workload evaluations should include a quantitative measure (e.g., a credit hour or course number multiplier) for faculty reading, evaluating, and responding to student writing. Such a measure would incentivize faculty to include writing in their classes and would more appropriately reflect the additional workload involved in teaching communication skills in a technical course. This multiplier would vary based on whether instructional support (i.e., TAs or graders) were available. If involved, Ph.D.-level students would have training and funding to assist with writing-intensive classes (since editing others' work is often effective at improving one's own writing), particularly for those Ph.D. students with academic career interests.
 - f. An improved web presence, including the development of online tutorial videos addressing common questions and communication best practices for use across the campus and updated opportunities and announcements about CxC initiatives.
 - g. A student peer-reviewed journal publishing the best work from across campus, showcasing work completed in writing-intensive coursework from multiple disciplines. An alternative or complementary idea is a peer-reviewed research journal for students who take research for credit (or maybe this would fit within the scope of this journal). This would provide faculty advisors with a defined deliverable for UG research, and we believe most would be enthusiastic about having students write up their results in a manner that could eventually be integrated into a journal article.

2. *Faculty Fellows*, one for each college, with special training in disciplinary writing and annual time commitment distributed across the departments/divisions in that college (3 FTE, Rank TBA.) Faculty Fellows would be responsible for
 - a. Curricular co-design and partial teaching of communications-intensive courses, and for
 - b. Providing resources for students to improve their communication capacities.
 - c. Faculty Fellows would serve on collaborative CxC instructional teams that include the Faculty Fellow and an engineering or applied science course coordinator. For instance, Faculty Fellows might collaborate with Senior Capstone Design and/or Field Session course leaders, but only if the Fellows are specifically requested by the instructors.

3. *Area of Special Interest in Professional and Technical Communication*, available to students, and modeled on the Louisiana State University certificate program (See Appendix C). Students could put this on their resumes as value added to potential employers.

4. *Industrial Advisory Committee*, to ensure that we tap into knowledge about the skills needed to succeed in industry. A three-person advisory board could provide input and feedback on the program, perhaps on an annual basis.

5. *CxC Upper-Level Elective*—a self-directed reading and writing course modeled after the MUST Writing in the Disciplines course, which showcases diverse disciplinary and industry writing genres (manuscripts, grants, memos, reports, etc.), and includes professionals outside of the university mentoring students.

Silver Model

The Silver Model retains key features of the Gold Model while distributing costs by creating Faculty Fellows at the departmental level and scaling back program level offerings/oversight.

1. CxC Director (1FTE), with resources to enact programmatic initiatives such as
 - a. A program that offers financial support and one-on-one guidance for departmental Faculty Fellows (described below) willing to redesign courses and requires that faculty present/share process with next generation of fellows, also perhaps in conjunction with TI²C.
 - b. Summer faculty workshops for CxC course planning and design with grants/awards offered for faculty who implement designs
 - c. Writing-intensive course designation program with faculty support for course development and delivery, perhaps in collaboration with the TI²C.
 - d. A year-long workshop series tailored to faculty needs.

2. Departmental Faculty Fellows

Each college would have the option to provide a course release to faculty who elect to engage in training and become Faculty Fellows *for their department* for a period of 3-4 years.

Departmental Faculty Fellows (DFF) would

- a. Consult on existing departmental writing-intensive courses;
- b. Perhaps create a new discipline-specific technical communication course under the guidance of the CxC Director, as long as that course becomes part of that faculty member's teaching load during the tenure of their Fellowship period; that course may not be a new course but replace another course (e.g., EPICS 251) that is not as germane to that degree program. One model for departmental Faculty Fellows is the Schultz Scholars Program at CSM.
- c. Hold meetings with the CxC Director to identify ways to help faculty move CxC forward at CSM.
- d. Contribute to a database of instructional resources so future instructors could teach the course after the DFF's term expires.

3. DFFs could also supervise a small cadre (3-5) of graduate communication fellows (GCFs) within each department. These GCFs, after receiving training and a communication instruction certificate, could work with the DFFs or other faculty to give feedback on report drafts of major documents (e.g., capstone course and/or other courses) to facilitate substantive revision. Also DFFs would be expected to create a database of instructional resources so future instructors could teach the course after the DFFs term expires. To incentivize GCFs, a small pool of funds could be made available to each GCF to support their professional development (i.e., for conference travel, other research support, etc.).

4. *Area of Special Interest in Professional and Technical Communication*, available to students, and modeled on the Louisiana State University certificate program (see Appendix C, #2). Students can put this on resumes and use as value added to potential employers.

Bronze Model

The Bronze Model attempts to reinstate and improve the basic WAC structure that was once in place. The model attempts to retain some key features of the Gold and Silver Models at a scaled-back version.

1. CxC Director (1FTE), with resources to enact programmatic initiatives such as
 - a. Summer faculty workshops for CxC course planning and design with grants/awards offered for faculty who implement designs
 - b. Writing-intensive course designation program with faculty support for course development and delivery, perhaps in collaboration with T1²C.

- c. A program that offers financial support and one-on-one guidance for departmental Faculty Fellows willing to redesign courses and requires that faculty present/share process with next generation of fellows, also perhaps in conjunction with TI²C.

2. Departmental Faculty Fellows

Each college would provide a course release to faculty who elect to engage in training and become Faculty Fellows *for their department* for a period of 3-4 years. Departmental Faculty Fellows (DFF) would consult on existing departmental writing-intensive courses; they might also create a new discipline-specific technical communication course under the guidance of the CxC Director, as long as that course becomes part of that faculty member's teaching load during the tenure of their Fellowship period; that course may not be a new course but replace another course (e.g., EPICS 251) that is not as germane to that degree program. One model for departmental Faculty Fellows is the Schultz Scholars Program. These faculty fellows should have meetings with the CxC Director to suggest ways to help faculty move CxC forward at CSM. Also DFFs would be expected to create a database of instructional resources so future instructors could teach the course after the DFFs term expires.

3. *Area of Special Interest in Professional and Technical Communication*

Available to students, and modeled on the Louisiana State University certificate program. Students can put this on resumes and use as value added to potential employers.

Recommendation

The CxC Committee recommends that the three models in this report—Gold, Silver, and Bronze—be reviewed by Undergraduate Council and endorsed by Faculty Senate before being considered by Academic Affairs. Committee members stand ready to field questions or offer guidance as this process moves forward.

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Appendix A: Examples of Faculty Requests for Writing Consultant Expertise

Select Faculty Requests

- Could we send every student in Chemistry 1 to the Writing Center for feedback on lab reports?
- Could a Writing Center faculty member train TAs in Chemistry on how to evaluate writing in lab reports?
- Could a Writing Center faculty member create a writing/communication module or unit for field session?
- Could LAIS offer a technical writing course that would be required of all Chemical Engineering students?
- Could LAIS offer ESL classes for graduate students?
- Could LAIS offer sections of NHV and/or Human Systems for International/ESL/NN speakers?
- Could someone help me create a professional communication class tailored to the needs of students in my major?
- Could someone in the Writing Center come deliver a specially-designed workshop or presentation in my class about a particular communication-related topic we are working on?
- Could Mines establish a website with writing and communication resources specially curated for scientists and engineers?
 - Could someone from the Writing Center meet with me to review how I address the writing outcomes for my class, and work with me to create rubrics that ensure I am assessing those outcomes in the best way possible?
 - Could someone from the Writing Center visit my class to give a short presentation on basic principles of clarity, style, and grammar?

Appendix B: Draft Survey Questions for CSM Faculty

Survey Questions for CSM Undergraduate-Degree-Granting Departments and Divisions

1. At present, and drawing from faculty, alumni, and industry perspectives, comment on the degree to which graduates from your B.S. degree program are prepared to meet or exceed workplace communication challenges?
2. Given the role communication plays in engineering and science workplaces, what CSM curricular responses should be taken, if any, to benefit B.S. graduates in your degree program?
3. What dimensions of communication should be emphasized, deemphasized, or omitted (e.g., writing, speaking, listening, visual representation, electronic communication)?
4. What role should technical and other faculty play in integrating communication across the disciplines?
5. What communication across the curriculum models or approaches are well suited to the exigencies of the engineering/science workplace communication demands CSM graduates are likely to encounter?

Appendix C: Noteworthy Programs

1) Worcester Poly Institute CxC Program

This is a dedicated CxC program with a director who is separate from the Writing Center Coordinator.

This emphasis at WPI is on creating writing intensive (WI)-designated courses across the campus that lends a mark of distinction to that course and the students who take it. The CxC website lists these courses for students and notes that every year more are updated as WI in the catalog. As of June 2014, sections from 22 courses in 10 different courses now have WI certification.

The WIP writing center is a Communications Center that helps students with oral presentations and visual design, making it a hub for more than just composition and writing assignments. In this way it encourages students from across campus to use its services for a variety of communication-based projects.

The CxC website is an attractive and well-organized source for both students and faculty. Here is one area where WPI shines; they cater to both student and faculty needs in establishing support for CxC initiatives, from workshops to professional development awards for implementing redesign elements into existing courses.

Examples of Faculty Resources

1) Teaching with Writing Workshop

Since 2010, WPI's *Spring Institute on Teaching with Writing* (SITWW) has brought together small groups of faculty from across campus for a series of intensive workshops, discussion, and course planning over a two-week period. The workshops introduce principles and best practices for writing in and across the disciplines, and they help faculty develop tools for assigning, teaching, and responding to student writing in their courses.

2) Year round workshops are offered on a variety of communication topics, such as Writing Better Sentences and Writing Better Writing Assignments. This fosters an interdisciplinary opportunity for faculty to gain new ideas on how to incorporate writing in science and technical courses.

3) The Writing Intensive Course Initiative to help instructors get certification for their courses. Upcoming workshops are posted on the website and appear to be actively up and running.

2) Louisiana State University Distinguished Communicator Certification

LSU's Distinguished Communicator Certification provides students with a unique way to increase communication skills and present themselves as distinguished in this area after they graduate. There is an application process, and students meet with a CxC rep once every semester to track progress. In addition to making at least a B in courses that count toward the certification, they must also attend 3 approved workshops. Required courses include a mix of written, spoken, visual, and technical communication modes. At the end of the semester the student showcases their skills with a public portfolio showcasing.

Distinguished Communicator Certification

LSU's Distinguished Communicators is a unique academic excellence program where students work to refine their communication skills and learn discipline-specific approaches to communication that will enable them to excel in their chosen profession. Candidates undergo a variety of training experiences and are required to build a digital portfolio, demonstrating proficiency in written, spoken, visual, and technological communication. They must also show successful use of their communication skills in leadership roles and community service. Upon completion of the program, these students possess the competitive skills and knowledge needed for 21st-century leadership. This coveted designation becomes part of official transcripts and gives the certified graduate significant leverage in today's job market. LSU is one of the only universities in the country recognizing students who excel in communicating within their discipline.

The program offers discipline specific studios to help with communication: Engineering Studio, Art & Design studio; and Humanities and Social Sciences Studio. The HSS studio offers help for any writing project as well as help with presentations and multi-media projects. These studios represent an innovative and cross-disciplinary resource for students and the many types of communication they may encounter. The CxC team includes both a Humanities and Social Sciences Coordinator and a College of Engineering Coordinator as part of the "team."

The CxC program also offers a 20 minute podcast sent out to faculty each week called the "Monday Morning Mentor" that quickly covers pedagogical issues, thereby extending the interdisciplinary presence of the program.

3) Missouri University of Science and Technology Center for Teaching Research and Innovation (CERTI)

At Missouri S&T, there is a long-standing Center for Teaching Research and Innovation (CERTI). They have initiated a "teaching partners" program, where faculty from different departments observe each other teach (find out more at <http://certi.mst.edu/teachingpartners/>).

Connected with CERTI, S&T offers an E-Fellows program designed to foster communication across departments and encourage teaching innovation and the use of technology in the classroom through special awards and grants. The program provides faculty with innovative workshops and one-on-one instruction and guidance in updating and redesigning courses, and this includes improving communication, both instructor to student and for students.

Dr. Daniel Reardon, the director of composition for S&T's English Department, has also recently redesigned the department's Writing in the Disciplines course. Students choose their own reading list for the course and create research projects in their own disciplines. He is also launching an undergraduate peer-reviewed journal, *S&T Peer to Peer*, that will feature the student research papers for the course. Their goal is to increase visibility across campus for student writing and research.

4) Denver University

First-Year Writing Sequence. After new students complete the first-year seminar, a fall term seminar taught by a faculty member on a subject of his or her passion, they enroll in a two-course sequence in winter and spring terms, in classes of 15.

Writing Center. The Center is staffed by trained students (grad and undergrad) and offers scheduled and drop-in consultations, workshops, and more** (see below).

ASEM. Students must complete a writing-intensive Advanced Seminar Course. The Writing Program provides faculty development and support for these classes.

Writing in the Disciplines. The Program offers development opportunities and support for faculty in every department, from informal consultations to extended workshops. The goal is to teach students the ways of writing vital to specific disciplines and professions.

Assessment and Research. Through both focused and longitudinal studies of student writing, the Program regularly assesses its effectiveness and contributes to the professional literature in rhetoric and composition studies. A four-year longitudinal study of 10% of the class of 2010 began in spring 2007.