

**SSOE Assessment of Teaching – Teaching Development Plan  
Engineering Education Research Center  
Version 3 for Submission**

**Overview**

Part of the Swanson School of Engineering’s (SSOE) vision is to be recognized for providing excellent educational programs. The School’s Appointment, Promotion & Tenure Review Committee (APTRC) has always emphasized teaching excellence. In 2011, the Engineering Education Research Center (EERC) was established to enhance the teaching and learning of engineering within the SSOE and expand engineering education research efforts (see <https://www.engineering.pitt.edu/eerc/>). In doing so, there is a strong focus on **teaching development** that leads to teaching excellence. For example, many engineering faculty are scholarly with their teaching innovations and publish in engineering education journals or present at educational conferences (e.g., ASEE). Further, we have several peer-reviewed grants (both internal to Pitt and external, such as NSF) throughout the SSOE, where the predominant focus is on improving the pedagogy of the classroom. Additionally, the SSOE focuses not only on the faculty but also on our Future Faculty (i.e., PhDs and Postdocs) and those individuals who assist the faculty in the classroom – our Teaching Assistants – both graduate and undergraduate students.

This document provides an overview of what our current practices are, as well as proposed teaching development.

**Current Status of Teaching Assessment and Teaching Development**

**Faculty**

Assessment of faculty teaching is conducted in the SSOE for multiple reasons: 1. Monitor and improve a particular course, 2. Conduct a faculty’s annual review and subsequently for promotion, and 3. Conduct course and program reviews for improvement and accreditation purposes. Table 1 delineates various assessments and artifacts that are routine in the SSOE.

The EERC provides routine STEM evidence-based teaching practices for faculty. See Table 2 (column 2) for Current and Past Professional Development Offerings. In addition, the SSOE requires all new faculty (Tenure Stream (TS) and Appointment Stream (AS) – assistant through full professor) to take two required workshops: *Bootcamp 101* and *Mentor camp 101*. *Bootcamp 101* is a daylong workshop to introduce new faculty to EERC and the philosophy of the SSOE regarding the teaching mission and SSOE practices. Participants are then introduced to the alignment model (learning objectives, assessment, teaching strategies), technology in the Benedum classrooms, academic integrity, necessary policies and resources for helping students, and opportunities to learn more. New faculty are also required to take Mentor camp 101. This two-day workshop is based on the National Research Mentoring Network (NRMN) and the Center for the Improvement of Mentored Experiences in Research (CIMER). The workshop provides faculty training on becoming an effective mentor, including aligning expectations, articulating a mentoring philosophy and plan, cultivating ethical behavior equitably and inclusively, maintaining effective communication with mentees to highlight a few areas. We in the SSOE are fortunate to have two people trained to give these workshops.

Further, the EERC works with department chairs to cost-share opportunities for faculty to attend nationally recognized teaching workshops (e.g., National Effectiveness Teaching Institute, Lean LaunchPad, Frontiers of Engineering Education, etc.). Since the inception of the EERC, faculty have been sent to over 90 national teaching workshops). Lastly, where necessary, department chairs seek the assistance of the EERC if an instructor requires additional help in the classroom. Depending on the nature of the concern, the EERC assists the instructor directly or involves UCTL resources.

***Table 1. Routine SSOE Teaching Assessments and Artifacts of Classroom Excellence***

Assessment	Evidence	Reason for assessment*	Frequency	Who Provides Evidence
Course - student satisfaction surveys (OMETS)	Survey	1, 2 & 3	End of Course	Student
Course – Midterm student satisfaction surveys (OMETS)	Survey	1, 2 & 3	Mid-Course	Student
New or revised courses with evidence of student learning	Varies	1 & 2	Throughout	Faculty or researcher
Engagement in EERC	Attendance of workshops/events	2	Annual	Faculty and Chair
SSOE, Pitt & Professional Society Teaching Awards	Documentation	2	Varies	Faculty
Journal and conference papers	Citations	2	Varies	Faculty
Educational grants	Proposal/annual reports	2 & 3	Varies	Faculty
Student satisfaction by level (FYEP, Sophomore, Junior, Senior Exit, Alumni)	Survey	3	End of Academic year	Student/Alumni
Departmental Curriculum Reviews	Summary of evidence documentation across multiple classes with recommendations for changes	3	Annually	Departmental Committee; External advisory committee

\*1. Monitor and improve a particular course, 2. Conduct a faculty's annual review and subsequently for promotion, and 3. Conduct course and program review for improvement and accreditation purposes

### **Next Generation Faculty – CIRT Network and Pitt-CIRT**

The University of Pittsburgh is a part of the CIRT Network (Pitt-CIRT), whose mission is to “enhance excellence in undergraduate education through developing a national faculty committed to implementing and advancing effective teaching practices for diverse learners as part of successful and varied professional careers.” The Pitt-CIRT Institutional Leader (Mary Besterfield-Sacre) and Administrative Co-leader (April Dukes) are members of the SSOE community.

Pitt-CIRT facilitates three 1-credit, on-campus professional development courses each academic school year; two are cross-listed as ENGR, BIOSC, and CHEM courses: 3001 Preparation for the STEM Classroom (Fall) and 3002 Advanced Learning Through Evidence-Based Stem Teaching (Spring). The third is listed as ENGR 3000 Preparation for an Academic Career (Spring), and while not cross-listed, students from other disciplines are provided waivers to register for this course.

Pitt-CIRT also hosts learning communities (LC) to allow individuals with shared interests to become future faculty. Each year, a monthly Teaching-As-Research LC meets to discuss the reflective practice of gathering and analyzing data to evaluate the effectiveness of teaching and learning. Additionally, a summer LC is held, and the topic varies based on interest. Topics for past summer LC sessions include Inclusive and Equitable Teaching (2021), Online Teaching (2020), Assessment Bootcamp (2019), and Mentor Training (2018).

### **TA Training**

Undergraduate and Graduate students must attend the Teaching Center’s New Teaching Assistant Orientation, department orientation, or an orientation sponsored by the EERC. In addition, the EERC’s New TA Bootcamp was recently switched from in-person only to hybrid for Fall 2019 and was entirely online for the 2020-21 academic year. Students complete training consisting of readings, watching videos, and answering quiz questions on Canvas. After completing the online modules, students meet (in person or over Zoom) with experienced engineering TAs to ask questions and discuss TA experiences.

### **As we advance – SSOE Teaching Development Program (TDP)**

In the SSOE, faculty and faculty leaders aid their colleagues by reviewing and providing feedback regarding teaching statements and aspects of the classroom experience. However, this has predominantly been done *ad hoc* and varies from department to department. As we advance, the EERC will provide a formal mechanism to help faculty develop their teaching expertise and help them document their work via portfolios and teaching statements to exemplify their work and their teaching service efforts.

The SSOE Teaching Development Program (TDP) consists of three areas.

- Packaging Teaching Innovations and Teaching Reflections
- Faculty Certification
- Service to the SSOE Teaching Mission

Though TDP will be open and available to all, the EERC will target this development to all new faculty (Tenure Stream and Appointment Stream) and engage Appointment Stream – Teaching faculty at the Associate and Full levels.

**Packaging Teaching Innovations and Teaching Reflections**

We intend to create a new workshop for faculty focused on developing their teaching statements and packaging their teaching innovations. The former is helpful as faculty consider promotion and present their teaching expertise. In addition, it provides a means for faculty to organize their thoughts, their interests regarding teaching. Further, as part of this workshop, we will offer faculty practices to package their teaching innovations, such as a two-page abstract or a conference paper.

**Faculty Teaching Skill Sets**

SSOE-EERC will implement a “badging system” for SSOE faculty that engage in professional development, peer mentoring, and leadership. The primary purpose for the badging will be for individuals, departments, and the EERC to track the development of the Teaching Skills of faculty within the SSOE and provide guidance on how to post efforts on their vitae and annual evaluations. Such badging displays teaching interests and expertise. Table 2 provides an inaugural outline of the certification badges and requirements for faculty. Offerings are provided by either outside facilitators or our own SSOE faculty and professional staff.

**Table 2. Suggested Badging for Professional Development in Teaching**

Badge Name	Current/Past Professional Development Offerings	Future Professional Development Offerings
Active Learning	<ul style="list-style-type: none"> <li>• Mike Prince</li> <li>• “How to Engineer Engineering Education”</li> <li>• Active Learning with CATS</li> </ul>	
Academic Integrity	<ul style="list-style-type: none"> <li>• Tricia Bertram-Gallant</li> <li>• Faculty Seminar on Academic Integrity</li> <li>• Creating a Classroom of Integrity: A Proactive, Pedagogical Response to Cheating</li> </ul>	<ul style="list-style-type: none"> <li>• Academic Integrity Committee Faculty Seminar</li> </ul>
Understanding Implicit Bias	<ul style="list-style-type: none"> <li>• Understanding Implicit Bias</li> <li>• Implicit Bias for Faculty Search Committees</li> </ul>	<ul style="list-style-type: none"> <li>• Intercultural Humility- Actively Working to Mitigate Implicit Bias</li> </ul>
Teaching Technology	<ul style="list-style-type: none"> <li>• Active Learning with TopHat</li> <li>• Gradescope Basics</li> <li>• Introduction to Canvas Course Design</li> <li>• How to Do Assessments in Canvas</li> <li>• MATLAB Grader</li> </ul>	

Badge Name	Current/Past Professional Development Offerings	Future Professional Development Offerings
	Matt Ohland <ul style="list-style-type: none"> <li>CATME – Forming and managing Teams to improve student team outcomes</li> </ul>	
Evidence-based Pedagogy	<ul style="list-style-type: none"> <li>New Faculty Bootcamp</li> <li>Using Rubrics for Fair and Transparent Grading</li> </ul>	<ul style="list-style-type: none"> <li>Working with TA's</li> <li>Reflective Teaching</li> </ul>
Mentoring Excellence (NRMN curriculum)	<ul style="list-style-type: none"> <li>New Faculty Mentor Training Session 1: Introduction to Effective Mentoring; Effective Communication</li> <li>New Faculty Mentor Training Session 2: Aligning Expectations; Assessing Understanding</li> </ul>	<ul style="list-style-type: none"> <li>Addressing Equity and Inclusion</li> <li>Cultivating Ethical Behavior</li> <li>Fostering Independence</li> <li>Promoting Mentee Research Self-Efficacy</li> <li>Promoting Professional Development</li> <li>Enhancing Work-Life Integration</li> <li>Articulating Your Mentoring Philosophy &amp; Plan</li> </ul>
Engineering Education Research		<ul style="list-style-type: none"> <li>Faculty engages in engineering education research through receiving a grant, presentation at a conference, or writing a paper</li> </ul>
Diversity, Inclusion, and Equity	<ul style="list-style-type: none"> <li>Promoting Inclusive Connections with Students in the Classroom</li> <li>Inclusive Practices Reduce Marginalization in the Classroom</li> <li>Building a Robust Mentoring Relationship with Communication and Career Planning</li> <li>Aligning Expectations using a Mentoring Philosophy and Plan</li> <li>Addressing Equity and Inclusion in the Mentor-Mentee Relationship</li> <li>Using Pronouns as One Way to Promote LGBTQIA Allyship</li> </ul>	<ul style="list-style-type: none"> <li>Teaching with an Inclusion and Equity Mindset</li> </ul>
Student Well-being	<ul style="list-style-type: none"> <li>Happiness Mini-Camp</li> <li>Student Concerns in the New COVID Environment</li> </ul>	<ul style="list-style-type: none"> <li>Mental Health First Aid Training</li> </ul>
Innovation and Entrepreneurship for Faculty		<ul style="list-style-type: none"> <li>Innovation and Entrepreneurship for Faculty</li> </ul>

### **Service to the SSOE Teaching Mission**

The third area of the SSOE TDP involves a pay-it-forward component for Associate and Full Professors. Effectively enhancing the teaching culture in the SSOE requires faculty investment. Therefore, the EERC proposes to have Faculty Teaching Ambassadors. Ambassadors may lead workshops and learning communities for specific badges or help in conducting behavioral classroom observations and providing feedback to instructors.

Teaching Ambassadors from each of the six SSoE departments and the freshman program will be identified to support instructors in their teaching practices. The Ambassadors are fellow instructors who will provide consultation and supportive assessment to their peers by conducting planning and review sessions with them and classroom observation using the COPUS protocol. EERC personnel will prepare and coach the Ambassadors in their roles. The planning and review sessions will include reviewing syllabi and other teaching practices using the *Planning and Observational Checklist* developed for summer 2020 remote instruction (Clark et al., 2020). The

checklist consists of active learning and interactivity sections, academic integrity considerations, LMS use, student communications, assessments, and asynchronous resources. Data from the classroom observation and planning/review sessions (i.e., the checklist) will be available to the instructor to include in their teaching portfolio for promotion and tenure review.

This inaugural year will be spent with training, implementation, and development of a governance plan for the committee. Each ambassador will receive a nominal stipend to spend as they choose (e.g., funds to attend an academic conference, other educational needs) as a reward for this departmental service. In addition, the collected data will be reviewed by an SSOE committee periodically to identify general needs and opportunities.

### **TA Training**

New for the 2021-2022 academic year, SSoE faculty who utilize TA's will be invited to an EERC sponsored workshop *Working with TA's*.

### **Investigation in Reasons for Poor Teaching Evaluations**

Reasons vary for why faculty get poor ratings (e.g., poor organization, not caring, difficult accent to interpret, etc.) and are well documented in the literature. However, in providing developmental assistance to faculty facing teaching challenges, it is essential to know the underlying reasons for poor performance before specific workshops target particular areas for improvement. Therefore, over the next year, the EERC will request access to de-identified SSOE OMET open-ended comments of those SSOE instructors who rated in the lower 10% and compare them to comments of those SSOE instructors who rated in the upper 10% to determine critical areas that separate high ranking instructors from low-ranking instructors. We will then create targeted mini-workshops for faculty.

### **References**

- Clark, R., Besterfield-Sacre, M., & Dukes, A. (2020). Supportive Classroom Assessment for Remote Instruction. *Advances in Engineering Education*, 8(4), 1-6.

### **Review and Feedback**

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#### **Review, Revision, and Approvals**

- Undergraduate Program Coordinators
- Associate Dean for Graduate Education
- Departmental Chairs
- APTRC Committee Chair
- Dean Martin