

Scholarship Standards

Department of Electrical Engineering and Engineering Programs

1. Scholarship in the Department of Electrical Engineering and Engineering Programs

Our call as faculty in engineering is to promote our educational mission to prepare students with a Christian worldview who are called to serve, equipped to lead and sent to engage the world with their lives and through the appropriate use of technology. To achieve this, we envision the Engineering Programs at Seattle Pacific University as a national leader in undergraduate engineering education through innovative academic programs that integrate Christian faith and calls to service to our local and international communities through hands-on learning. As part of our overall plan for engineering, we embrace our role as educator-scholars. Furthermore, we believe that to effectively educate our students, we must be actively engaged in scholarship. These standards for scholarship are provided to delineate our expectations with regards to scholarship for promotion and tenure.

2. Types of Scholarship

We believe that scholarship enables effective teaching, and thus scholarship is an important part of a full-time tenure track or tenured faculty's vocation. The Scholarship of Discovery, Teaching, Application, and Synthesis as described in the *Faculty Employment Handbook* are valued by the engineering faculty and provide the basis for our expectations in scholarship. We encourage faculty to engage in scholarship to support the mission of SPU and the vision of the engineering programs described above. This includes, but is not limited to a focus on innovative engineering education methodologies, and the integration of engineering and calls to service in our local and international communities. The types of scholarship in each of the four areas (discovery, teaching, application, and synthesis) are provided below.

Scholarship of Discovery: The scholarship of discovery involves the creation, discovery, or advancement of new knowledge by means of the tools and disciplined practices of one's academic field. In the Engineering Programs at SPU, there are two issues related to the scholarship of discovery as it applies to engineering. First, engineering is an applied discipline, so that the opportunities for new discoveries in the scientific sense are not generally a major focus of engineering research activities. However, we recognize in engineering the concept of discovery as also the creation of patentable devices. Second, we recognize that the research involved in supporting new discoveries in the scientific sense may be difficult to undergo given the nature of SPU and its mission. Therefore, contributions in this area are welcome, but not expected, and it is anticipated, and in fact encouraged, that faculty members collaborate with colleagues at other research oriented institutions or within SPU in this work. The primary venues for the scholarship of discovery in engineering include patents, peer reviewed publications in recognized engineering journals, peer reviewed full length papers in published engineering conference proceedings, and successful external grant applications in support of this work. It is expected that, in particular, the publications (journal and/or conference) and grant applications will often have multiple authors, including those at other institutions.

Scholarship of Teaching: Engineering education provides a venue for the scholarship of teaching. Engineering education scholarship entails the development of new strategies for teaching in the engineering discipline. Examples include the development of strategies and methodologies that promote hands-on and inquiry based learning and that enhance

classroom interaction for distance learners. Venues for scholarship include peer reviewed publications in education related journals in engineering and/or higher education, full length peer reviewed conference papers in published engineering education related conference proceedings, textbooks demonstrating the application of new teaching strategies, and successful external grant applications in support of engineering education.

Scholarship of Application: Engineering is an applied discipline, and as such traditional engineering scholarship can be often be characterized as the scholarship of application. This type of scholarship can involve advancement of the profession through research, academic, and/or professional practice applications. These applications include applied research in a specific engineering discipline, development of academic programs and materials in new discipline areas, and adaptation of new standards in industry. Primary venues for scholarship include peer-reviewed publications in technical or educational engineering journals; full-length, peer-reviewed conference papers in published engineering conference proceedings; engineering textbooks in new areas or those previously lacking adequate teaching materials; industrially adopted codes and standards; and successful external grant applications in support of this work.

Scholarship of Synthesis: The engineering discipline impacts many aspects of our society, and consequently there are many opportunities for collaborative work with other disciplines. There are numerous applications for the scholarship of synthesis; some of these include collaboration with faculty in other scientific disciplines to advance or apply knowledge in new areas (this type of scholarship overlaps with the scholarship of discovery and/or application); collaboration with other faculty on the impact or use of technology in society; and the relationship between Christian theology and the engineering discipline. Specific examples include intra-disciplinary collaboration between electrical and mechanical engineers, inter-disciplinary collaboration with biologists on research related to bioengineering, collaboration with faculty in sociology, business, and theology to develop programs to prepare engineers to work effectively in developing countries, and the integration of the call for stewardship and the engineering profession for Christian engineers. Venues for the scholarship of synthesis include, but are not limited to, peer-reviewed journal articles and conference proceedings directed to an interdisciplinary and/or Christian audience, successful external grant applications in support of this work, peer-reviewed publications intended for the general public, and textbooks or monographs on interdisciplinary topics. It is expected that these scholarly products will have multiple authors in a variety of disciplines.

3. The Particular Kinds of Public Scholarly Products

According to the *Faculty Employment Handbook*, formal expression in the production of scholarly products is defined as *work that is publicly disseminated and subject to careful peer review*. Following this guideline, examples of the kinds of public scholarly products were provided in Section 2 for each type of scholarly product. These primary kinds of public scholarly products are:

- Patents
- Peer reviewed publications in journals related to engineering, and/or higher education, and/or a Christian perspective (in print or electronic media)
- Peer reviewed publications in conference proceedings (in print or electronic media)
- Peer reviewed (extended) abstracts in conference proceedings (in print or electronic media)
- Successful external grant applications (with an abstract available to public) for engineering related scholarship or educational outcomes

- Textbooks, monographs, and book chapters
- Industrially adopted codes and standards

Other professional activities are also indicative of one's achievement as a scholar and can serve to augment the scholarship listed above. (Some of these are also considered as professional service.) These include

- Presentations at regional/national/international engineering related conferences
- Non-peer reviewed conference papers
- Invited presentations at other institutions of higher education
- Successful internal grant applications
- Paper reviews for peer-reviewed journals and conference proceedings
- Panel reviews for national (e.g., government) grant applications

4. Types of Peer Review Most Common and Valued within the Engineering Discipline

Two types of peer review within the engineering discipline are common. One is for the individual product and the other is for the total body of work.

The peer review process using external confidential peer-reviewers is most commonly used in the engineering discipline in evaluating individual scholarly works for publication. Typically a peer reviewed article (e.g., journal, conference proceeding, textbook, or monogram) has undergone review by two to three scholars (nationally or internationally selected) in the engineering discipline with an appropriate background to review the particular subject material. External grant applications related to engineering and industrially adopted codes and standards are typically reviewed by a panel of scholars.

The peer review of a scholar's total body of work is aimed at assessing the overall quality and significance of one's contribution to the profession. Awards, national recognition (including being asked to or elected to serve on national committees or as a journal editor), citations, can be evidence of the value of one's overall contributions to the profession. For tenure and promotion in rank, the peer review of a candidate's body of work typically includes evaluation by colleagues at a higher rank at the candidate's institution and at least one written evaluation from a disciplinary peer at a peer institution. Qualified reviewers in industry or government positions will also be considered as appropriate.

5. Sense of Trajectory of a Productive Scholar in Engineering at Peer Institutions

The trajectory of one's professional scholarship is a very important component in evaluating a candidate for tenure and promotion. Typical indications of trajectory for engineering at peer institutions include the items listed in Section 3 along with:

- A coherent and well defined research plan with evidence of continuing implementation
- Submission of journal manuscripts to be considered for publication
- Presentations at professional conferences
- Participation on national committees related to the engineering profession
- Submission of external research grant applications
- Implementation and/or adaptation of one's scholarly activities in the classroom
- Participation in research activities (e.g., experiments) necessary to the development of a research publication.

6. Scholarship Expectations

In the review process, the quality of the scholarship and the trajectory of the work are key issues in the decision making process for both promotion and tenure. We also recognize that each person is individually created by God with their own unique gifts. Therefore, quantifying expectations for the general case is difficult. The following are provided as guidelines for tenure and promotion at various levels, and exceptions to these guidelines may occur on occasion. We recognize that we all experience personal changes in life (e.g., the birth of a child, health issues, care of elderly parents, etc.) or changes in research direction within the discipline which can alter or temporarily interrupt the intended trajectory of one's scholarship. These will also be considered in the evaluation process.

Third Year Review: At the time of the third year review, there must be clear evidence of one's potential for achieving engineering's scholarly standards for tenure and promotion as outlined below. Thus, peer review will focus on one's trajectory as a professional scholar, as discussed in Section 3. At a minimum, the candidate must have developed a detailed research plan that is supported by a body of completed work and work in progress. This should include at least one piece of scholarly work published, accepted, and/or submitted since coming to SPU.

Tenure: The expectations for tenure are consistent with those described in the Faculty Employment Handbook. The two dimensions to be considered as specified in the handbook are 1) the faculty member's character and of his or her congruence with the mission of the University; and 2) the faculty member's competence and of his or her contribution to the University, the broader academy, and culture at large. Evidence of this competence will be evaluated from the body of scholarly work including items listed in Section 3.

Associate Professor: Scholarship standards for promotion from Assistant to Associate Professor include evidence of a scholarly body of work and potential for continued development as indicated by review including but not limited to engineering faculty at SPU and at least one external review from faculty at a peer institution. The candidate will provide a list of potential reviewers. The body of scholarly work will include at least four peer-reviewed scholarly works as indicated in Section 3, with at least one of these being a peer reviewed journal publication. In addition, the candidate's narrative should clearly outline his/her contributions to the discipline and his/her scholarship trajectory.

Professor: Scholarship standards for promotion from Associate Professor to full Professor include evidence of a scholarly body of work appropriate for the rank as indicated by review including but not limited to engineering faculty at SPU and at least one external review from faculty at a peer institution. Qualified reviewers in industry or government positions will also be considered as appropriate. The candidate will provide a list of potential reviewers. The body of scholarly work should include a minimum of four items listed in Section 3 published or completed since the previous promotion, with at least one of these being a significant piece of work (e.g., journal article, book, or monograph). In addition, evidence of prominence in one's discipline as indicated by professional service and recognition by his/her peers (e.g., awards, activities in professional societies, etc.) should be included in the promotion file.