

Departmental Specific Scholarship Standards
Department of Electrical Engineering
Effective June 2015

The Santa Clara University Faculty Handbook (3.4.2) states:

"Because the nature of teaching, scholarship or artistic creativity, and service differs in some respects among academic disciplines, the faculty of the college, schools, and division develop, adopt, and publish their respective clarifications of the three criteria. Candidates for tenure or promotion are referred to these publications, as amended from time to time, for a detailed explanation of the standards and procedures by which they will be evaluated."

"In accordance with the Faculty Handbook, discipline-specific standards for tenure and promotion have been developed by departments or disciplinary areas to clarify the criteria and guidelines for promotion and tenure review for both candidates and evaluators. These standards should inform and guide, but not dictate, the professional review of a candidate's portfolio. As noted in the Handbook, the standards may be revised from time to time to reflect changes and refinements within the discipline."

The electrical engineering candidate must show clear evidence of sufficient scholarship to justify tenure and/or promotion. This will ordinarily be demonstrated through a number of publications in journals and conference proceedings in the appropriate area of scholarship. The work should be original, rigorous, and impactful.

DISCIPLINE DESCRIPTION

As opposed to the scientists, engineers create things – devices, products, processes, e.g. – that are not already there. Accordingly, scholarship in engineering may span the range from highly theoretical to applied. Electrical engineering is different from other engineering disciplines in its level of abstraction and range of topics. Instrumentation is often needed to make electrical behavior visible to us in a form that we can perceive. For many areas of electrical engineering mathematical models are essential, and to design complex devices and systems that will be efficient and reliable, sophisticated design and simulation tools are used.

The original areas of electrical engineering included electromagnetics, communication, information theory, control, and power and energy. These areas have steadily grown to include emerging areas such as micro-electronics, computers and architectures, embedded systems, image and signal processing, medical instrumentation, microwave and RF, robust and nonlinear control systems, and nanoscience.

Electrical engineering scholarship may overlap with other disciplines, such as Physics, Applied Mathematics, Bioengineering, Computer Engineering, and Mechanical Engineering.

FORMS OF EVIDENCE

Scholarly work includes journal articles, conference and workshop proceedings, books, and invited lectures. External funding is not necessary for promotion but, is another measure of acknowledging the value of the research. These documents are sufficient for assessment of appropriate performances by SCU faculty as well as external reviewers.

Excellence in the scholarly activity of a faculty can be observed in the quality of their publications. There are several ways to measure the quality of a publication. These metrics include: the quality of the journal, the number of citations of the publication and the expert opinions of the referees. The quality of the journal should be judged by several metrics including its reputation, its impact factor, and the quality of the editorial board. The Institute of Electrical and Electronics Engineering (IEEE) publishes the top-tier journals in electrical engineering. However, journals from other publishers such as ACM and IET may be more appropriate for selected topics. For an emerging area, there may not be an established journal in that topic. In addition to journals,

conference papers may be considered. As with journals, the reputation of the conference and the impact of the conference publication should be considered.

Other items that should be considered when evaluating research activity are:

Co-authorship and author order.

- It is typical for an engineering professor to write papers with one or more students.
- Some research areas require equipment that we do not have at SCU and/or access to more students; so it is not uncommon for an SCU professor to collaborate with professors from other universities or national research laboratories. Such collaborations are encouraged.

Requirements for publications

- In some areas, a circuit or device design will not be published without a physical realization of the device. This is a limiting factor for some EE research at SCU.

Funding for research

- External funding for research is an additional indicator of significance and expected impact of the research. Possible funding sources include federal funding agencies, national laboratories, subcontracts through other universities as part of larger funded research, and industrial sponsorship. Success in securing funding from any of these three sources demonstrates the scholarly activity of the applicant, and how it has been perceived by the funding organization. There is no specific requirement for external funding for electrical engineering faculty.
- Internal funding may be obtained for projects aligned with the mission and strategic plan of the university and also for preliminary research that would lead to external funding.

UPDATES & REVISIONS

- This document was last reviewed by the electrical engineering faculty on 14 March 2014. It has been amended based on recent faculty discussion, and a new revision on May 28, 2015.