

DEPARTMENT SPECIFIC SCHOLARSHIP STANDARDS
Department of Civil Engineering
Effective June 4, 2015

PREAMBLE

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 accord 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.

PREFACE

Faculty members must present clear evidence to justify their tenure and/or promotion. These guidelines describe standards for scholarship within the Civil Engineering Department applicable to evaluation of candidates for tenure and promotion to the ranks of Associate Professor and Professor. Disciplinary and sub-disciplinary measures of quality, including specific forms of evidence, are described, including information about appropriate venues, productivity, and impact.

DISCIPLINE DESCRIPTION

The American Society of Civil Engineers¹ defines Civil Engineering as a “profession in which a knowledge of the mathematical and physical sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the progressive well-being of humanity in creating, improving and protecting the environment, in providing facilities for community living, industry and transportation, and in providing structures for the use of humanity.” The Department educates engineers in both the technical and socioeconomic aspects of civil engineering, to prepare them to contribute positively to the design, construction, maintenance and advancement of civil engineering-based systems critical to the quality of life in a changing world. Reflecting this, our scholarship standards encompass relevant technical and pedagogical advances, creative applications, and effective communication of these scholarly endeavors, as detailed below.

FORMS OF EVIDENCE

The Department embraces a broad model of scholarship that includes fundamental advances in engineering sciences, development of new engineering methods and technologies, and advances in

¹ As stated in the Civil Engineering Body of Knowledge for the 21st Century—Preparing the Civil Engineer for the Future, Second Edition, 2008, this definition was adopted by the ASCE Board of Direction in 1961.

engineering pedagogy. Based on Ernest Boyer's scholarship model (Boyer, 1990) and ASCE's Body of Knowledge (ASCE, 2008), the Department recognizes scholarly contributions in knowledge discovery (fundamental, investigative research), knowledge integration (synthesis of multi-disciplinary work), knowledge application (application to consequential problems), and knowledge dissemination (bridging understanding primarily through effective innovation in teaching). While innovative teaching itself is not considered scholarship, formal research in pedagogy within Civil Engineering is an acceptable domain for scholarship.

Scholarly work must be original, rigorous and of high quality, demonstrating clear goals, adequate preparation, appropriate research methods, and significant results (Glassick et al. 1997). Scholarship within Civil Engineering often will be applied (rather than fundamental) research and may include experimental work, field data gathering, numerical modeling, and pilot and proof-of-concept tests at laboratory scale. The best work is recognized as significant, is influential within academia, may be influential in practice, and contributes to realization of the School of Engineering's vision and mission.

Applied research along with inter- and multi-disciplinary research is valued as highly as fundamental research. Work of practical significance is valued by the Department, when that work complements scholarly contributions. Furthermore, there is no requirement that the body of work display a single unifying theme; eclectic accomplishments are valued without prejudice, as long as the entire body of scholarly work demonstrates expertise within a civil engineering subdiscipline.

Suitable venues for communicating engineering scholarship include peer-reviewed journals, practice periodicals, conference/congress proceedings, workshop proceedings, book chapters, monographs, and books.

Scholarly contributions within civil engineering also may include patents, contributions to codes of practice and industry standards, demonstrations of functional capability, and the adoption of tools, methods, and systems within communities of practice, depending on scholarly content. Reviews or referee reports for journals, books, granting agencies, and the like are considered service and not scholarship.

Publication in prestigious peer-reviewed journals provides an indirect and objective basis for establishing that a publication is rigorous, significant, and of high quality. The more prestigious journals are indexed in Journal Citation Reports®. In the absence of legitimate reasons to the contrary, the Department values rigorously peer-reviewed publications above other publications. While faculty are encouraged to attend and participate in relevant conferences, publication in peer-reviewed journals is generally preferred over conference proceedings. However, publication in peer-reviewed specialty conferences may be valued in cases where original results must be disseminated in a timely fashion. An often-used strategy is to publish early or incomplete results in important conferences, followed by publication of the complete work in a prestigious journal. Of course, documenting research results and providing reports to sponsors may be necessary even if this documentation is not peer reviewed. Self-published and on-line work lacking rigorous peer review is generally of less value. Publication in so-called "pay-to-play" conference proceedings and predatory journals (e.g., Butler, 2013) is of no value.

While impact at national and international levels generally is valued over impact at the local or regional levels, substantial impact at any level is recognized. Some consideration may be given to journal impact factors and article citation counts, recognizing that these provide only an indirect basis for evaluating scholarly impact and that norms vary among sub-disciplines. Contributions to codes and guidelines are valued primarily for their impact on practice. Impact in the discipline is also recognized by professional organizations (e.g., awards, distinguished invited lecturer status or elevation to the rank of fellow). Consulting work may be valued as a recognition of expertise depending on the nature of the contribution and the degree to which it advances the profession.

Even when conducted at universities that have significant research infrastructure, experimental research generally requires substantially more time to complete relative to research that is analytical or numerical in nature. Significant funding, labor, facilities, and technician support are often necessary, and typically for an extended time period. Our historical focus on teaching has resulted in having laboratories that are dedicated to instruction; we lack laboratory facilities and technical staff dedicated to and available for research activities. Thus, while students may be able to assist with some aspects of experimental research, the scale of effort required is considered in evaluating the rate of publication.

Since very few of our M.S. students do research-based theses, and we do not have a Ph.D. program, department faculty typically conduct research on their own or in collaboration with colleagues, who may be at other institutions. Collaborations are encouraged provided that the candidate clearly demonstrates the ability to make independent research contributions, whether as sole-author or as a contributor in multi-author publications. Participation of undergraduate and graduate students in research is valued for its contribution to our students' development, and thus is recognized as part of a candidate's teaching accomplishments. Publications with student co-authors are valued as highly as those without.

The Department recognizes that funding is more vital for some forms of research, and is not needed for others. Faculty are strongly encouraged to seek external funding commensurate with their research needs. Success in attaining external funding is not a criterion for evaluation of scholarship success or impact. However, success in nationally competitive arenas may demonstrate a candidate's ability to develop compelling proposals on topics recognized to be important by disciplinary experts.

External reviewers from within the candidate's discipline/sub-discipline are asked to provide evaluations of the rigor, originality, and impact of the candidate's scholarly contributions, the prestige and appropriateness of the publication venues, and the value of non-publication contributions.

A candidate for promotion to Associate Professor must produce a sufficient quantity of scholarship to allow its quality to be assessed and to suggest a commitment to and trajectory of active scholarship. Accepted manuscripts and works in progress are considered.

A candidate for promotion to Full Professor based on having distinguished scholarly contributions must establish a substantial body of work as an Associate Professor that has demonstrated excellence, impact, and recognition in the profession. Completed scholarship of appropriate stature and impact is considered.

Work that occurred prior to a candidate's employment in a tenure-track position at SCU or prior to a candidate's most recent promotion at SCU is of secondary value. The date when the research contribution was made is of interest (and not the date of publication).

Some attributes that would impact negatively on the Department's view of scholarship include a lack of significant peer-reviewed publications and lapses in scholarly ethics (such as a lack of enforcement and poor record of safe practices in the conduct of experimental research, and complicity in reporting fraudulent results).

EXAMPLES

The following examples illustrate accomplishments over a five-year probationary period that would generally be viewed at the Department level as having no apparent weaknesses in scholarship for promotion to Associate Professor:

- Analytical emphasis: Candidate A published 8 journal papers in high-quality peer-reviewed journals. Candidate A gave 4 invited talks and contributed 3 additional talks at leading academic conferences in the candidate's field.
- Experimental emphasis: Candidate B completed three distinct experimental studies at SCU and at this point has published 4 articles on two of these projects in high-quality peer-reviewed journals; manuscripts on the third project are undergoing peer review. Candidate B has also filed 2 invention disclosures. Candidate B has given 4 invited talks at leading academic conferences and occasionally consults with industry in areas of his/her expertise. Significant external funding was obtained and used to improve campus laboratory facilities.
- Pedagogical emphasis: Candidate C developed innovative teaching methods that were used in his/her courses at SCU that were the subject of his/her research. These methods included student participation in traditional civil engineering research projects as well as service learning via international projects conducted with non-governmental organizations abroad (consistent with the University mission). Candidate C has published 6 articles in leading peer-reviewed journals on engineering pedagogy. Candidate C has given talks on engineering pedagogy at sister institutions, and is working with these institutions to establish new pedagogically-driven activities, which aim to improve the program and will be the subject of planned research studies.

In these examples, differences in publication counts reflect the time that is required to produce research accomplishments. A trajectory of active scholarship would be indicated by an appropriate number of manuscripts in review and recently initiated research studies.

UPDATES & REVISIONS

This document is to be reviewed and possibly revised by the Civil Engineering Department every five years. This current version of the document was approved by the department on May 19, 2015.

REFERENCES

- ASCE (2008). "Civil Engineering Body of Knowledge for the 21st Century," Second Edition, American Society of Civil Engineers, New York.
- Boyer, Ernest L. (1990). *Scholarship Reconsidered-Priorities of the Professoriate*, Jossey-Bass, Inc. Publishers.
- Butler, W. (2013). "Investigating journals: The dark side of publishing," *Nature* 495:433-435, March 28.
- Glassick, Charles E., Mary Taylor Huber, and Gene I. Maeroff (1997). *Scholarship Assessed-Evaluation of the Professoriate*, Jossey-Bass, Inc. Publishers.