

## Boise State University College of Engineering Research & Scholarly Activity Guidelines

In this document, scholarly activities refer to activities intended to develop and disseminate new knowledge. Scholarly activities have three major benefits:

- They contribute to the advancement of the profession.
- They bring recognition to and enhance the reputation of the university, college, and department.
- They attract students and help create a culture of scholarship within the college.

The following table represents a range of scholarly activities. These activities are organized into 4 basic categories – publication, research, professional reputation enhancement, and student education.

Major category	Specific scholarly activities
Publication	Peer-reviewed publications <ul style="list-style-type: none"> <li>• Articles in refereed, top-tier conferences in fields in which conference publications are the preferred medium</li> <li>• Books and book chapters</li> <li>• Conference papers</li> <li>• Journal articles</li> <li>• Laboratory manuals</li> <li>• Research-based educational media materials (for example, simulations, tutorials, etc.)</li> </ul>
	Technology transfer <ul style="list-style-type: none"> <li>• Developing technical products</li> <li>• Filing patents/invention disclosures</li> <li>• Obtaining patents</li> <li>• Research-based development of software and other products that have a broad impact</li> <li>• Reviewing technical papers or reports (in the public domain)</li> </ul>
	Publications that are not peer-reviewed <ul style="list-style-type: none"> <li>• Conference proceedings (papers or abstracts)</li> <li>• Journal articles</li> <li>• Reviews of books, articles, software, or other materials</li> <li>• Technical or general interest magazine articles</li> <li>• World Wide Web materials related to one's scholarly activity or research agenda</li> </ul>
Research	Proposals submitted <ul style="list-style-type: none"> <li>• In response to a Request For Proposal (RFP)</li> <li>• Industry collaborations</li> <li>• Investigator initiated</li> </ul>
	Proposals funded <ul style="list-style-type: none"> <li>• Contracts</li> <li>• Equipment grants</li> <li>• Infrastructure grants</li> <li>• Research experience for undergraduates grants</li> <li>• Research grants</li> </ul>

	Conducting sponsored research <ul style="list-style-type: none"> <li>• For national, state or local agencies</li> <li>• For professional organizations</li> <li>• For the university, college, or department</li> </ul>
Professional Reputation	Developing novel system solutions or ingenious experiments
Enhancement	<ul style="list-style-type: none"> <li>• Professional contributions             <ul style="list-style-type: none"> <li>○ Conducting workshops or conference sessions</li> <li>○ Giving keynote addresses or invited talks</li> <li>○ Obtaining summer faculty fellowships</li> <li>○ Presenting papers or posters at conferences</li> <li>○ Serving as a panel member at conferences</li> </ul> </li> <li>• Serving as discussant, respondent, or moderator for conference presentations</li> <li>• Receiving research awards</li> <li>• Reviewer for journals, proposals, and textbooks</li> <li>• Serving as an editor or editorial board member for journals, technical magazines, or conference proceedings</li> </ul>
Student Education	<ul style="list-style-type: none"> <li>• Advising students for dissertations, theses, honors theses, culminating projects, directed research projects, or senior design projects</li> <li>• Developing courses to include/highlight research and research methods</li> <li>• Developing new academic programs</li> </ul>

### **RANKING SYSTEM FOR MEASURING SCHOLARLY ACTIVITIES**

The following list rearranges the scholarly activities from the preceding table into three quality levels, with level A representing those activities that bring the greatest benefits to the university, college, and department and Level C representing those activities that bring lesser benefits. Within the levels, items are listed alphabetically.

#### **Level A**

- Advising students for dissertations or theses
- Conducting sponsored research
- Conducting workshops or presenting conference sessions at international meetings
- Developing new academic programs
- Developing novel system solutions or ingenious experiments
- Publishing articles in peer-reviewed journals (including electronic journals)
- Publishing articles in refereed, top-tier conferences in fields in which conference publications are the preferred medium
- Publishing books and book chapters
- Publishing research-based educational media materials (for example: simulations, tutorials, etc.)
- Receiving external grants or contracts for research, as a result of written proposals (principal investigator or co-principal investigator)
- Receiving research awards
- Research-based development of software and other products that have a broad impact

#### **Level B**

- Advising students for honors theses or culminating projects
- Conducting workshops or presenting conference sessions at national meetings
- Developing courses to include/highlight research and research methods
- Developing technical products
- Giving keynote addresses or invited talks
- Obtaining patents
- Obtaining summer faculty fellowships
- Publishing laboratory manuals
- Publishing peer-reviewed conference papers.
- Publishing reviewed technical papers or reports (in the public domain)
- Receiving internal grants or contracts (principal investigator or co-principal investigator)
- Serving as a panel member at conferences
- Serving as an editor or editorial board member for journals, technical magazines or conference proceedings
- Writing proposals for external grants or contracts

### **Level C**

- Advising students for directed research or senior design projects
- Conducting workshops or presenting conference sessions at regional or local meetings
- Filing patent/invention disclosures
- Presenting papers or posters at conferences
- Publishing articles in journals or conference proceedings, (including electronic archives of research papers) that are not peer-reviewed
- Publishing conference abstracts
- Publishing reviews of books, articles, software, or other materials
- Publishing technical reports or general interest magazine articles
- Publishing World Wide Web materials related to one's scholarly activity or research agenda
- Serving as a discussant, respondent, or moderator for presentations at conferences
- Serving as a reviewer for journals, proposals, and textbooks
- Writing proposals for internal grants or contracts

## **Computer Science Addendum to the COEN Description of Scholarly Activities**

### **Conference versus Journal Publications:**

Computer Science is a rapidly evolving discipline, where publication in peer-reviewed conference proceedings is preferred to publication in journals, because of its impact and timeliness. We quote three eminent computer scientists on this topic below.

*“Relying on journal publications as the sole demonstration of scholarly achievement, especially counting such publications to determine whether they exceed a prescribed threshold, ignores significant evidence of accomplishment in Computer Science and Engineering. For example, conference publication is preferred in the field, and computational artifacts -- software, chips, etc. -- are a tangible means of conveying ideas and insight. Obligating faculty to be evaluated by this traditional standard handicaps their careers, and indirectly harms the field.” [1]*

The Department also notes that several Computer Science conferences are more selective than even the leading IEEE and ACM journals (See page 138 in [2]). The College guideline already lists top-tier peer-reviewed conferences as Level A activity but the department wants to emphasize that item.

### **Experimental Computer Science:**

The Computer Science Department explicitly encourages experimental activities. However the Department realizes that the nature of experimental Computer Science leads to differences from traditional engineering and sciences. To that extent, we use the report “*Academic Careers for Experimental Computer Scientists and Engineers*” as a guide in evaluation. The following quote from the executive summary describes how an experimental computer scientist's activities may be difficult to compare to the activities of other kinds of faculty.

*“More generally, universities should recognize that an experimentalist being considered for tenure or promotion may have fewer publications (and predominantly conference publications), nonstandard forms of dissemination (e.g., distribution of software artifacts), substantial amounts of collaborative research, and few graduate students completed, and yet still be a spectacular researcher. A judgment should be based on the presence or absence of the following:*

- *One or more computational impact-producing artifacts completed;*
- *Research results disseminated to and used by the community;*
- *A reputation for novel systems solutions or ingenious experiments; and*
- *A filled or filling pipeline of well-trained graduated students.” (See page 7 in [2])*

The College guideline does include impact-producing artifacts as a Level A scholarly activity and the Department would like to emphasize the importance of such work. There is often considerable extra work to polishing an artifact that typically does not lead to more publications. However such polished artifacts are much more likely to have impact on the field and lead eventually to broader benefit for the wider community.

### **References:**

1. “Computing Research Association Best Practices Memo: *Evaluating Computer Scientists and Engineers For Promotion and Tenure*,” David Patterson (University of California, Berkeley), Lawrence Snyder (University of Washington) and Jeffrey Ullman (Stanford University), *Computing Research News*, Special Insert, September 1999.
2. *Academic Careers for Experimental Computer Scientists and Engineers*, 1994, National Academy Press, Washington, D.C. (This report was commissioned by the National Research Council, whose members are drawn from the Academy of Sciences, the National Academy of Engineering, and the Institute for Medicine. The committee that prepared the report consisted of eminent Computer Scientists and Engineers.)

### **Construction Management Addendum to the COEN Description of Scholarly Activities**

Within the Department of Construction Management, all faculty are encouraged to be proficient and current in their disciplines as well as in their teaching skills. A definition of what the Department interprets as “Faculty Scholarship” is outlined in the following paragraphs.

The department recognizes and endorses the concept of the scholarship of Discovery as described in the Carnegie Foundation report entitled *Scholarship Reconsidered: Priorities of the Professorate* (1990). The scholarship of Discovery captures what is meant when academics speak of “research.” **Discovery** is the outcome of creative endeavor, scholarship, and research. The Purdue University Faculty Handbook classifies Discovery into three broad categories, which are well suited to the strategic goals of the Department of Construction Management:

- **Discovery of learning** (frequently called “educational scholarship”) focuses on sharing the results of discovery, and validation of innovations in curriculum content, pedagogy, and student learning assessment with others in the candidate’s educational community.
- **Discovery of application** (frequently called “applied research”) focuses on sharing the results of theory in the application of technology or the candidate’s area of expertise as applied to industry, government, or public and private agencies.
- **Discovery of knowledge** (frequently called “basic research”) focuses on sharing the discovery of new knowledge that may ultimately result in applied research and educational scholarship.

All candidates for promotion and tenure within the Department of Construction Management are expected to demonstrate a history of professional growth and development in one or more of these categories. In the broad field of study and education referred to as “Construction Management,” most successful candidates for promotion and tenure will demonstrate excellence in the discovery of learning and/or the discovery of application. Some candidates may, however, demonstrate significant accomplishment in discovery of knowledge.

### **Discovery of Learning**

Construction Management is a unique interdisciplinary program committed to educating future leaders in the construction profession. This commitment requires the integration of the construction, engineering and business principles needed by graduates to compete in today's international construction community. This integration requires strong emphasis on teaching and learning to bring effective and innovative pedagogical methods to a student body possessing a broad range of experiences, interests, and motivations. As a result, most faculty members will demonstrate excellence in discovery of learning through the results of their educational scholarship. Faculty members are encouraged to share their instructional innovations with other institutions and peer groups through nationally published textbooks, journal publications, conference presentations, seminars and workshops, and the mentoring of junior faculty through co-authorship.

In addition, many faculty develop instructor manuals, tutorials, laboratory manuals, case studies, casebooks, study guides, projects, workbooks, software, courseware, and the like, which may ultimately evolve into published or presented works that disseminate instructional concepts and techniques.

National publication and adoptions of printed or electronic textbooks, workbooks, case studies, tutorials, reference manuals, laboratory manuals, etc. is evidence of impact at both local and national levels. It is recognized that the publication of such instructional materials often involves greater sustained effort and time than other types of publications.

Publication of refereed and reviewed articles in sources such as educational journals and educational conference proceedings is consistent with the mission of sharing curriculum and instructional innovation with the academic community in one's discipline. In addition to describing curriculum ideas, innovations, pedagogy, and process, it is expected that educational scholarship be focused on improved learning that is demonstrated through accepted methods of measurement and assessment. Refereed publications such as journal articles are recognized as stronger scholarly achievements than reviewed or non-refereed publications.

*Note: A publication is considered "refereed" when professional peers who serve on the editorial board of the publication publish the article on the basis of a blind review of the complete article. Any other peer review process is considered "reviewed." Most conference proceedings are considered reviewed.*

Evidence of grant writing related to curriculum, course, and laboratory development is important to the continuous improvement of Construction Management education. Normally, successful grant writing will result in published scholarship as described above.

### **Discovery of Application**

The department's mission also includes applied research for the purpose of technology transfer. Faculty can demonstrate excellence in discovery of application through the products of applied research. The discovery of application, like the discovery of learning, is frequently measured by publication and presentation in appropriate markets and forums. But applied research may also result in the development of new products, or publications that help practicing professionals reproduce the results of application.

At any given time, numerous technologies are emerging that need to be tested in industry for useful application. Faculty are encouraged to seek out opportunities to engage industry in projects that will test the limits of these emerging technologies. This applied research must culminate in publications, presentations, or industrial reports that describe the methods used to apply the technology, the tangible and intangible results, and recommendations for future application and applied research. It is expected that applied research ultimately results in measurement and assessment of value.

Faculty members are encouraged to share their application knowledge and discoveries with industry and other appropriate peer groups through trade periodicals and journals, industry and user group conference presentations, and professional seminars and workshops.

Student involvement in applied research projects that result in theses, directed project reports, and publications is considered distinctive.

Evidence of funded grants in applied research, either agency- or industry-funded, is considered distinctive, especially if interdisciplinary in nature.

Publication of reviewed articles in sources such as trade periodicals, trade journals, monographs, white papers, technical reports, technical studies, technical newsletters, and special interest group publications is consistent with the mission of sharing applied research results and innovation with industry and professional groups within one's discipline.

Publications that promote technology transfer for industry, trade groups, and practicing professionals are other possible products of applied research. Such publications include books for the professional market, trade journals, technical reference manuals, and tutorials.

### **Discovery of Knowledge**

It is recognized that teaching and applied research sometimes stimulates or results in discovery of knowledge. Construction Management faculty may engage in appropriate funded basic research that results in publication of the discovery of new knowledge. These activities enhance a candidate's credentials for promotion and tenure.

Achievements for the discovery of knowledge may take on one of the following forms: (1) refereed articles published in, or manuscripts submitted to, research-oriented journals or conference proceedings, (2) published reviews of research books and research papers, (3) invited research lectures and presentations of research, (4) funded grants for basic research that contributes to the advancement of knowledge in one's discipline, (5) directing graduate student research, and (6) national or international research and creative endeavor.

### References

Boyer, E. L. (1990). *Scholarship Reconsidered: Priorities of the Professorate* San Francisco: Jossey-Bass.

Purdue University Faculty Handbook for Academic Promotion and Tenure. Prepared by the Area Committee College of Technology Purdue University for its West Lafayette Campus and Statewide Technology Locations. January 2007, Version 5.0.