**Association for Interdisciplinary Studies (AIS)**

**Guidelines for Tenure and Promotion for Interdisciplinary Faculty**

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*Introduction: The Task and Contexts for Action*

In March 2014 the Board of Directors of the Association for Interdisciplinary Studies (AIS) appointed a task force to prepare guidelines on tenure and promotion (T&P) for interdisciplinarians. The members of the task force, listed alphabetically, are former AIS Presidents Julie Thompson Klein, Karen Moranski, and Roslyn Schindler. They were responding to a widely expressed need for guidelines that both faculty and institutions can use in preparing and evaluating individual cases. Tenure and promotion have historically operated with the implicit and explicit purpose of affirming standards and authority of the professoriate. Yet, discipline-dominated criteria do not ensure appropriate assessment of interdisciplinary work. As new faculty begin their careers, they frequently hear their institutions welcome it. During formal review, however, they often get mixed signals. Michael Ruse's blog entry on "Interdisciplinary Studies," which appeared December 9 of 2010 in the *Chronicle of Higher Education,* contends this reality is at worst a kind of bait and switch. Ruse is not alone in calling attention to the gap between the rhetoric of endorsement and the reality of practice. Preliminary surveys of individuals and institutions for the 2004 National Research Council report on *Facilitating Interdisciplinary Research* identified tenure and promotion as the top-ranked impediment to interdisciplinary faculty work (2004, 73).

National reports and other literature also call for rewarding, rather than marginalizing or penalizing, their work. In 2007, the Council of Environmental Deans and Directors issued the first overview of stages of interdisciplinary careers. Entitled

*Interdisciplinary Hiring, Tenure and Promotion: Guidance for Individuals and Institutions*, it includes concrete strategies along with sample documents for a Memorandum of Understanding (MOU) and a Checklist for Annotating an Interdisciplinary Curriculum Vitae. (Pfirman et al). Klein's 2010 book *Creating Interdisciplinary Campus Cultures* includes a chapter on "Monitoring the Interdisciplinary Career Life Cycle" that covers T&P along with strategies for faculty development, and the same year Graybill and Shandas presented advice on navigating stages of an interdisciplinary career. Professional organizations have also assumed leadership. The American Studies Association and the National Women's Studies Association have issued guidelines for appropriate evaluation in their fields, and the American Psychological Association issued a resource document on *Appointment, Tenure, and Merit Review Considerations for Psychologists with Joint Faculty Appointments and Involvement in Interdisciplinary/Multidisciplinary Research and Scholarship* (2014).

The AIS guidelines contribute to this emergent literature by aggregating best practices. We regard this document as evolving and we invite user input. The document has two audiences. For faculty, the guidelines follow the career arc from hiring through tenure and promotion across categories of faculty work: education (e.g., teaching, curriculum development, mentoring and advising) and research (e.g., scholarly publications, conference presentations, grants, and patents), with additional advice about service. For institutions, the guidelines inform deliberations by unit faculty and chairs, college- and university-level administrators, and tenure and promotion committees at all levels. The document also includes pertinent references, and the weblink provides a sample Memoranda of Understanding/Letter of Agreement (MOU/LOA), and a community space where faculty can share their experiences and further tips.

In keeping with its mandate, AIS emphasizes documented evidence of work that goes beyond multidisciplinary breadth and isolated contributions to achieve integration and synthesis in both solo or collaborative efforts. The generic term "interdisciplinary" is used for both inter- and trans-disciplinary work, with emphasis on the common benchmark of integration. Evidence may include syllabi and assignments for courses that facilitate self-conscious and proactive interdisciplinarity; publications and conference presentations that articulate the interdisciplinary nature of the research design, theory, methodology, and outcomes; and curriculum and program development that incorporate explicitly integrative experiences rather than a multidisciplinary mix of separate department-based courses a series of disciplinary research perspectives. Institutions should also take responsibility for revising disciplinary-dominated guidelines for T&P, rather than expecting faculty to conform to criteria that do not fit the nature of their work. The University of Southern California's (USC) UCAPT Manual on "University Committee on Appointments, Promotions, and Tenure" provides a template for other campuses. When revising current documents care should be taken to eliminate exclusionary language and provide examples of work that would count for advancement.

Any set of guidelines provides the imprimatur of its sponsoring organization, but it should also be responsive to local institutional culture: including the history of interdisciplinary programs on a particular campus, patterns of involvement across units and faculty and staff ranks, degrees of support for faculty development and student learning, the nature of a particular position, and the degree to which interdisciplinary work qualifies for incentives and awards. Four overriding areas merit close attention across all levels of the evaluation process: the MOU/LOA, joint appointments, collaborative work, and dossier preparation. They should be considered in all categories of the detailed guidelines below, in addition to other recommendations specific to individual categories.

The MOU/LOA

The MOU/LOA is the foundational document for an appointment. It should be the result of consensus among a new hire and all institutional parties, delineating expectations for interdisciplinary education and research, mentoring and advising, institutional and community service, budget and personnel resources, space, and travel support. It should also be consulted throughout pre-tenure and tenure review, to insure all parties are accountable for terms of the agreement. During the hire's annual review, the document should be scrutinized, not only to determine an individual's progress in designated areas but also whether it needs to be revised to acknowledge new developments per changing conditions of the position. If stipulations in template language on a campus conflicts with the MOU/LOA, the discrepancy should also be resolved. Finally, the original and any modifications should be included in a candidate's personnel file at all levels, from the immediate unit of a department or program to the college and the provost's office.

Joint Appointments

Joint appointments are a familiar structure for interdisciplinary work. During an interview for such a position, a prospective hire and the search committee should explore and finalize each unit's expectations for teaching, research, advising, and mentoring, then be sure they are included in the MOU/LOA. The typical pattern for joint appointments specifies a "home" department and "other" unit, while designating the percentage of time to be devoted to each. It is crucial that the MOU/LOA also specify how interdisciplinary work will be represented in the review process. The most common approach is to make the home department the key unit, although a chair or director in the other unit should be a member of the T&P committee or at a minimum include a letter in the candidate's file. The dean is also a pivotal figure in insuring representation of interdisciplinary work in a college-level letter that may adjudicate

differences across units if necessary. Section 2.0 of USC's T&P model, on "Interdisciplinary Work," urges committees to make a special effort to understand other disciplines' customs regarding publication and conference outlets as well as co-authorship, a primary topic in positioning a candidate who record includes collaborative research and teaching.

Collaborative Work

Increase in collaborative research is a notable feature of the knowledge landscape today, and team teaching is a long-established practice in interdisciplinary studies. USC's "Guidelines for Attributing Contributions to Research Products and Creative Works" sound a principle that should be heeded in both cases: "fair and honest attribution." Recommendations for co-authorship often distinguish substantial intellectual contributions meriting authorship from other contributions. Practices also vary. In some cases, a Co/PI or other senior faculty member is automatically first author, though in other cases contributors appear in alphabetical order. Regardless, their efforts should be credited somewhere in the actual publication then explained in the personal statement and curriculum vitae (CV). USC's Section 2.8 on "Collaborative Work" recommends explaining the kinds of collaborations and their significance and impact on both the immediate project or program and scholarship in the pertinent area. It also echoes other documents in suggesting collaborators write letters of explanation and administrators acknowledge their importance as well. The CRediT model (Contributor Role Taxonomy) is a useful reference for publications: it includes Conceptualization of Ideas, Methodology, Software, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, Supervision Oversight, Project Administration, and Funding Acquisition (Brand, Allen Altman, Hlava, and Scott). For team teaching, James Davis's table of areas and degrees of collaboration provides a framework spanning planning,

content integration, teaching, and evaluation (1995, 20).

Dossier Preparation

Pfirman and colleagues express the plight of many interdisciplinary faculty seeking tenure and promotion: they must often negotiate their own process and structure at the same time they are trying to navigate them. The dossier is the pivotal document in the process and often has the added function of educating both internal and external reviewers about what interdisciplinary work entails, especially needed in the case of cutting-edge research and innovative teaching. Preparation should begin from the moment of appointment by setting up an electronic file with the job ad, MOU/LOA, a CV, and pertinent evidence of accomplishments in sub-files for research, teaching, and service. In an evolving personal statement and annotated CV, candidates should define the pertinent field, its epistemic community, qualified peers, genres of scholarship, venues of publications and presentations, funding sources, awards, public or stakeholder engagement, and any extra service work a position requires. Pfirman and colleagues (2011) suggest enclosing a list of frequently asked questions (FAQs) as well.

**_Guidelines for Tenure and Promotion for Interdisciplinary Faculty_**

**A.    Guidelines for Position Description and Hiring Process**

1. **What should institutions do? (Including provosts, deans, and governance committees such as academic senates)**
   a. Plan ahead for interdisciplinary hires by reviewing institutional readiness to support them, then be explicit in the position advertisements about expectations and support for positions. The search plan should contain

interview questions that explicitly address interdisciplinary interests, skills, and experiences.

b. Provide public access for all stakeholders to personnel policies that define institutional policies for pre-tenure and tenure and promotion review.

c. As positions are available, hire university-, college-, and department/unit-level administrators who support interdisciplinary education and research and would reinforce pertinent criteria of evaluation for both hiring and review.

2. **What should academic departments/divisions/programs do?**

a. In consultation with deans and university-level administrators, determine the need for interdisciplinary faculty positions, including cross-unit collaborations.

b. Develop protocols and practices that provide appropriate support for interdisciplinary faculty work, including the following:

- Reach consensus on the position, ad, and MOU/LOA;
- Define expectations for responsibilities in teaching, curriculum development, advising and mentoring, research policies, and procedures for pre-tenure and tenure and promotion reviews;
- Provide mentors inside the unit and if needed outside as well;
- Develop positive relationships with other units the hire may affiliate or collaborate with (e.g., departments and centers).

3. **What should chairs/division heads/program administrators do?**

a. Insure that committees are representative of disciplines and fields pertinent to the position, and adopt a search process that reflects and rewards the interdisciplinary nature of the position.

b. Work closely with search committees to develop a job description that delineates responsibilities and qualifications to be meet, while also specifying tenure home and preferred disciplines and/or fields.

c. Once a candidate is selected for an offer, ensure the recommendation is approved expeditiously and takes into consideration relevant interdisciplinary strengths for the unit, the college, and the university.

4. **What should job candidates do?**

a. Identify in the application letter and CV pertinent disciplines and fields for the needs of the position, with documentation, including samples of related work.

b. Identify references who can address interdisciplinary strengths related to the position.

c. Inquire whether a campus visit would require a teaching demonstration and/or a research presentation, being mindful that a broad audience may need an introduction to concepts, terminology, and theory from relevant disciplines.

d. When preparing for the interview, assemble or design interdisciplinary syllabi for topics, issues, or questions pertinent to the unit(s) involved; for research, articulate relevance to needs of the unit and the institution.

e. Inquire about opportunities for interdisciplinary teaching and research, and, in the case of collaborative work related policies, procedures, and politics.

f.  Be prepared to discuss the relationship between disciplinary and interdisciplinary work, while seeking clarification about similarities and differences in expectations for education and research.

g.  Ask whether curriculum development is expected and will be counted during pre-tenure years. When also asking about academic advising and research mentoring, clarify whether they are considered teaching or service, whether time spent on them can be "banked" for release time, and whether co-presentations and co-authorships count for tenure.

**B.  Guidelines for Early Career/Junior Faculty**

**1.  What should institutions do? (Including provosts, deans, and governance committees such as academic senates)**

a.  Provide adequate support for start-up funds for interdisciplinary educators and researchers, including travel funds, equipment, space, and materials.

b.  Provide funds for release time for interdisciplinary course development and/or grant-seeking, especially in the first year.

c.  Ensure policies on sabbatical leaves are structured and worded to be inclusive of interdisciplinary work.

e.  Provide leadership in mentoring junior faculty, including the following:

- Develop faculty development workshops related to interdisciplinary teaching and research;

- Host working groups to develop high-quality teaching, scholarship, and creative works;

- Provide assistance with dossier preparation that specifically addresses interdisciplinary dimensions of interdisciplinary faculty and teaching and research;

- Assure appropriate peer review in selecting evaluators.

f.  Train department chairs and division directors to deal with complexities of interdisciplinary hiring, retaining, tenuring, and promoting.

g.  Educate graduate students and postdoctoral fellows in new specialties and become acquainted with their knowledge and techniques.

h.  Include interdisciplinary work in existing awards and honors as well as incentive and seed-work grants.

i.  Include as appropriate a letter in the file from the unit leader and/or the dean.

2.  **What should academic departments/divisions/programs do?**

a.  Provide mentoring related to teaching, research, service, and grant-writing (if applicable) tailored to particular areas of interest. [See Section II.1.e above.]

b.  Regularly monitor and affirm the importance of the interdisciplinary position to participating units as well as college- and university-level administrators.

c.  For joint appointments, agree on a joint process for pre-tenure and tenure and promotion review, insuring representation from all units. Percentages differ, though the CEDD recommends a 60/40 split.

3.  **What should chairs/division heads/program administrators do?**

a.  Meet with interdisciplinary faculty member regularly (e.g., annual review) to track progress in meeting expectations described in the MOU/LOA and to assist in navigating the political environment at all levels, while also reviewing the language of the agreements and guidelines to see if adjustments are needed.

b. Assign a mentor or mentors, one inside the unit and others outside as needed order to help the candidate navigate both institutional processes/policies and accompanying politics, to evaluate existing support, and to determine appropriate balance of responsibilities, including service.

c. Guide faculty through pre-tenure review processes, helping them and members of designated units negotiate complexities of an interdisciplinary career path.

d. In the case of joint appointments, consult with chairs of collaborating programs, departments, and/or centers or institutes regarding progress of the candidate's work.

e. Establish committee structures and membership for pre-tenure and tenure and promotion review to ensure appropriate consideration of interdisciplinary work for both single and joint appointments.

4. **What should early career interdisciplinarians do?**

a. Be familiar with faculty personnel policies to determine whether they are inclusive of interdisciplinary work and if not, make those in authority aware of these AIS Guidelines and other authoritative literature and models.

b. Request samples of pre-tenure and tenure and promotion portfolios and documents from other interdisciplinary faculty at the same and other institutions as well as relevant professional organizations.

c. Seek connections with recognized interdisciplinarians by inviting experts to campus to give talks and by seeking feedback on teaching and research including outside reviews.

d. Seek expertise on campus and in professional organizations such as AIS related to

- Teaching and curricular content, methodologies, and theories of more than one discipline or field;
- Pedagogies, including team-teaching, and design of syllabi and integrative assignments;
  integration in curriculum and research design and implementation;
- Appropriate assessment of interdisciplinary student learning and research process.

f. Seek out colleagues to review syllabi and to observe teaching, making sure those faculty provide feedback that explicitly addresses interdisciplinarity; document contributions to team-teaching and/or guest lectures for colleagues.

g. For research, build expertise in a particular interdisciplinary area.

h. Be strategic and seek guidance on where to present and where to publish.

**C.   Guidelines for Pre-Tenure, Tenure, and Promotion Review**

Note: Colleges and universities have a variety of models for pre-tenure review. Some engage in annual reviews during the pre-tenure years, while others have intermittent reviews in, for example, year three or years two and four.

**1. What should institutions (provosts, deans, governance/personnel committees, as appropriate) do?**

a. Be aware of and respect relevant knowledge domains.

b. Heed documentation in the candidate's personnel materials of the quality and value of contributions to interdisciplinary teaching and research, including collaborative work where pertinent.

c. In the dean's support letter, articulate ways in which the candidate's work enriches the academic culture of the college and the university.

2. **What should academic departments/divisions/programs do?**

   a. Provide assistance with the P&T application or mid-cycle review by helping the candidate navigate complexities of making the case.

   b. Assist them in articulating and synthesizing relevant knowledge domains.

3. **What should chairs/division heads/program administrators do?**

   a. Consult external experts on emergent or ID fields relevant to the position and ensure that information is made available to members of personnel committees.

   b. Be aware of and respect knowledge domains appropriate and relevant to the faculty member's work.

   c. In their formal letters, document explicitly from the candidate's personnel materials evidence of the quality and value of contributions to interdisciplinary education and research.

   d. Articulate the ways in which the candidate's work enriches the academic culture of the department/division/program.

   e. Ensure individuals about whom there are questions in the review process get a fair hearing in college and university personnel committees, as well as dean's reviews.

4. **What should interdisciplinary tenure and promotion candidates do?**

   a. No later than one year prior to application for tenure/promotion, review the dossier with mentors to determine what needs to be done for final review, including availability of all materials; reorganize as needed to correspond to the application.

b. Meet with department chair/division head/program administrator to discuss strategy for selecting external reviewers who are familiar with interdisciplinary work.

c. Review a model dossier and application for tenure/promotion from a recent, successful candidate at local and/or national levels.

d. Review best practices for Dossier Preparation and visibility of Collaborative Work, per paragraphs above.

### *Interdisciplinary MOU Checklist*

The following MOU checklist is excerpted from Pfirman et al (2007) *CEDD Guidance*.  The American Psychological Association's resource document (2014) and the Computing Resource Association's Best Practices Memo (Pollack 2008) also offer the following best practices: a) MOUs should be in writing and be signed by heads of units as well as the faculty member, with each party receiving a copy; b) details should include, at a minimum, specifics and service requirements for teaching and service, procedures for annual merit reviews and mid-cycle reviews (prior to tenure), and retreat right where appropriate.

1. *Strategic Issues*
   - Managing expectations
   - Maintaining flexibility and contingencies

2. *Home*
   - Department(s)/program(s)/ center(s)
   - Space
   - Budget (amount and split)
     - Salary

- Start-up

3. *Promotion/Tenure Committee Research/Teaching Community*

- Balance

4. *Disciplinary/Interdisciplinary*

- Balance

5. *Mentoring and Advising (Departmental/External; Formal/Informal; Research)*

- Basic/applied/theoretical/ descriptive
- Publications
  - Number
  - Journals
  - Citations
  - Style: synthesis, analysis
- Presentations
  - Annual meetings of professional societies
  - Workshops
  - Invited versus volunteer
  - On campus
- Support
  - Funding sources
  - Amounts

6. *Public Scholarship*

- Outreach
- Engagement

- Stakeholder involvement

7. *Teaching*
    - Departments
        - Classes
    - Team teaching
    - Advising
        - Undergraduate
        - Academic
        - Research
        - Graduate

8. *Campus Participation (Department/Program Meetings)*

9. *Committees*
    - National
    - International
    - Leadership

10. *Campus Programming*

Approvals:

Departments

Program(s)/Center(s)

Dean(s)/Provost

***Sample Tenure and Promotion Policies***

1. Columbia University. Columbia University Medical Center. *Joint and interdisciplinary appointments*. Retrieved from http://cumc.columbia.edu/faculty/sites/default/files/Joint_%20Interdisciplinary_Appointments.pdf

2. Drexel University (2010). *Tenure and promotion policy*. Retrieved from http://www.drexel.edu/provost/policies/overview/. See Sections II.A.3, II.F.1.a, and II.F.2.a.

3. North Carolina State University. Department of Interdisciplinary Studies. *RUL 05.68.65 - Department of interdisciplinary studies post tenure review standards and procedures*. Retrieved from https://policies.ncsu.edu/rule/rul-05-68-65

4. University of Minnesota. College of Liberal Arts. *Joint appointments tenured and tenure-track faculty*. Retrieved from http://intranet.cla.umn.edu/faculty/JointAppointmentsRegFaculty.php

5. University of California, Berkeley. Office of the Vice Provost of Academic Affairs and Faculty Welfare. *Guidelines for joint academic appointments at UC Berkeley*. Retrieved from http://apo.berkeley.edu/Joint_Academic_Appointments.09.pdf

***Sample MOUs and LOAs***

1. Michigan State University. Lyman Briggs College. *Memorandum of understanding for interdisciplinary scholars*. Retrieved from http://www.lymanbriggs.msu.edu/faculty_staff/MUFJA.cfm

2. The Ohio State University. College of Arts and Sciences. *Interdisciplinary faculty appointments. Summary description document*. See "Form" at https://www.ohio.edu/cas/dean/faculty-affairs/interdisciplinary-appointments.cfm.

**Selected Resources on Tenure and Promotion**

American Psychological Association (2014). *Appointment, tenure, promotion, and merit review considerations for psychologists with joint faculty appointments and involvement in interdisciplinary/multidisciplinary research and scholarship: A resource document*. Board of Scientific Affairs. Retrieved from http://www.apa.org/science/leadership/bsa/interdisciplinary-joint-appointments.pdf.

> Provides an overview of policies, best practices, and resources for administrators and faculty involved in MD and ID research and education, holding joint appointments or both plus special cases. Includes structure and flexibility, process and criteria of review, and percentages and expectations for teaching and service workloads, advising and mentoring, salary and resources. Appendices include a sample MOU, related checklists from the University of Michigan and USC, and a sample letter soliciting a review.

Choi, Bernard C. K. and Pak, A. W. P. (2007). Multidisciplinarity, interdisciplinarity, and transdisciplinarity in health research, services, education and policy: 2. Promotors, barriers, and strategies of enhancement. *Clinical Investigative Medicine, 30* (6), E224-E232. Retrieved from http://cimonline.ca/index.php/cim/article/viewFile/2950/1067

Friedman, D. and Wardell, D. (2010, September 17). *Aligning promotion and tenure policies to promote interdisciplinary research*. University Leadership Council, Education Advisory Board. Washington, DC: Advisory Board Company. Retrieved from http://www.uky.edu/ie/sites/www.uky.edu.ie/files/uploads/EAB_RM_Aligning-Promotion-and-Tenure-Policies-to-Promote-Interdisciplinary-Research.pdf

> Analyzes how 11 universities have overcome disciplinary barriers to hiring, tenuring, and promoting faculty doing interdisciplinary work. Observes that major changes in tenure policies may not be necessary if universities develop broader support infrastructures and MOUs that set clear expectations for faculty work and if they adapt the format and presentation of the tenure dossier to allow for richer explanations of interdisciplinary work. Asserts that challenges continue to exist in the emphasis on single author publications, privileging disciplinary journals. Describes models such as research centers and institutes and cluster hiring and identifies the importance of support for interdisciplinary research from senior faculty, deans, and outside experts.

Klein, J. T. (2010). *Creating interdisciplinary campus cultures*. San Francisco, CA: Jossey-Bass.

Klein, J. T. (2012). Monitoring the interdisciplinary career. In J. Gaff and J. Ratliff (Eds.), *Creating interdisciplinary campus cultures* (pp. 127-151). San Francisco, CA: Jossey-Bass and Association of American Colleges and Universities.

Lattuca, L. R. (2001). *Creating interdisciplinarity: Interdisciplinary research and teaching among college and university faculty*. Nashville, TN: Vanderbilt University Press.

> Explores the variety of interdisciplinary scholarship, including both research and teaching, and challenges traditional definitions of interdisciplinarity. Reports on interviews with 38 faculty members doing interdisciplinary work at four institutions. Explores the institutional environments in which interdisciplinary scholarship occurs to determine support for and impediments to that work. Offers advice and perspectives on interdisciplinary career paths through faculty narratives. Identifies some of the intellectual, professional, and scholarly rewards of interdisciplinarity,

including publications, and discusses the complexities of maintaining disciplinary ties.

McCoy, S. K. and Gardner, S. K. (2012, November-December). Interdisciplinary collaboration on campus: Five questions. *Change*. Retrieved from http://www.changemag.org/Archives/Back%20Issues/2012/November-December%202012/interdisciplinary-collaboration-full.html.

> Focuses on essential elements for interdisciplinary collaboration: time, people, resources, policies, structures, and supportive units in the context of the emerging findings from a five-year study. Identifies stages of collaboration and, in chapter six, explores faculty roles and expectations in the tenure and promotion process.

National Academies (2004). *Facilitating interdisciplinary research*. Washington, DC: The National Academies Press. Retrieved from http://nap.edu/11153.

> Examines the scope of interdisciplinary research (IDR) through the work of the National Academies' Committee on Facilitating Interdisciplinary Research. Defines and provides a vision for interdisciplinary research, describes the nature and focus of IDR, and examines the need for leadership to support it. Identifies the challenges of IDR and the changes needed in higher education, in professional societies, and in funding organizations to better facilitate IDR. Describes lessons to be learned by universities from industry and national laboratories. Provides recommendations for students and researchers at all levels and for changes in policy at academic institutions. Offers criteria for evaluation of IDR and suggestions for structural changes at colleges and universities. Highlights specific activities, programs, and policies as illustrative examples through text boxes.

Pfirman, S. (Ed.). (2011). *Interdisciplinary hiring and career development: Guidance for*

*individuals and institutions*. Council of Environmental Deans and Directors. Washington, DC: National Council for Science and the Environment. Retrieved from http://www.ncseonline.org/sites/default/files/Intedisciplinary%20Hiring%20Report_FINAL.pdf.

> Provides a set of guidelines regarding academic hiring and career development from pre- to post-tenure. Offers guidance organized around the stages of a faculty career, including structural considerations, position creation, search and hiring, early-career scholar development, reviews and tenure, and senior career development. Case studies from research intensive universities add institution-specific examples. Includes in the appendices a set of guidelines for interdisciplinary faculty appointments, checklists for interdisciplinary MOUs and joint appointments, an annotated interdisciplinary CV, a sample LOA, and a sample interdisciplinary faculty position advertisement.

Pfirman, S., and Martin, P. (2010). Facilitating interdisciplinary scholars. In R. Frodeman, J. T. Klein, and C. Mitcham (Eds.). *The Oxford handbook of interdisciplinarity*, (pp. 387-403). Oxford: Oxford University Press.

> Addresses the challenges faced by interdisciplinary faculty working within a disciplinary tradition and identifies methods institutions can use to facilitate interdisciplinary scholarship. Identifies different types of interdisciplinary research and teaching and analyzes the complexity of pursuing these types of activities in the traditional university setting, particularly for junior faculty. Discusses support mechanisms through the scholarly life cycle, including the structuring of interdisciplinary hires, productivity (publication), recognition, evaluation and promotion, and funding. Retrievable in draft form at

www.pkal.org/documents/**Pfirman_Martin**_HOI_draft.pdf.

Pollack, M. and Snir, M. (2008, July). Promotion and tenure of interdisciplinary faculty. Computing Research Association. Best Practices Memo. Retrieved from http://archive.cra.org/reports/promotion_tenure.html

> Provides generalizable recommendations for department heads managing the careers of interdisciplinary faculty written from a computer and information science and engineering perspective. Includes guidance on joint appointments and interdisciplinary tenure within a single department. Also provides recommendations to interdisciplinary junior faculty.

Simmons, E. and Nelson, M. (2011, August 19). Making interdisciplinarity possible. *Inside HigherEd*. Retrieved from https://www.insidehighered.com/advice/2011/08/19/simmons_nelson_essay_on_memorandums_of_understanding_for_interdisciplinary_faculty_jobs#.Vlt_xiNn0rA.mailto.

> Encourages institutions to adopt a written Memorandum of Understanding (MOU) for each faculty member who embarks on an interdisciplinary career, especially faculty members with joint appointments. Provides an overview of the contents of an MOU and describes the roles an MOU can play for administrators, faculty members, and evaluators. Contains a link to sample MOUs from Michigan State University.

### Other Resources

Amey, M. J. and Brown, D. F. (2006). *Breaking out of the box: Interdisciplinary collaboration and faculty work*. Greenwich, CT: Information Age Publishing.

> Provides a methodical plan for developing interdisciplinary collaboration and deals with challenges of confronting tradition and of generating "transition and transformation.", Includes discussion of preliminary work

that must be accomplished for collaborations to work, such as dealing with university bureaucracies and academic culture. Explores the affective and cognitive habits necessary for interdisciplinary collaboration and effective leadership. Contains an extensive bibliography, as well as an appendix that covers research design and methodology.

Biglan, A. (1973). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology*, *57*, 204-213. http://dx.doi.org/10.1037/h0034699

Borrego, M. and Cutler, S. (2010). Constructive alignment of interdisciplinary graduate curriculum in engineering and science: An analysis of successful IGERT proposals. *Journal of Engineering Education, 99*, 355-369. doi: 10.1002/j.2168-9830.2010.tb01068.x.

Identifies learning outcomes and criteria for evaluating graduate learning in an interdisciplinary context. Offers an analysis of 130 funded proposals from the U.S. National Science Foundation's Integrative Graduate Education and Research Traineeship (IGERT) program, Identifies four desired student learning outcomes: contributions to the technical area, broad perspective, teamwork, and interdisciplinary communication skills. Concludes that interdisciplinary learning outcomes need to be clarified and aligned with learning experience to improve interdisciplinary graduate education in STEM fields. Provides specific recommendations for engineering and science faculty members: define clear learning objectives, enlist assessment/evaluation expertise, and constructively align all aspects of the curriculum.

Davis, J. R. (1995). *Interdisciplinary courses and team teaching: New arrangements for learning*. Phoenix, AZ: American Council on Education/Oryx.

Dewulf, A., Francois, G., Pahl-Wostl, C. and Taillieu, T. (2007). A framing approach to

cross-disciplinary research collaboration: Experiences from a large scale research project on adaptive water management. *Ecology and Society, 12* (2), 14. Retrieved from http://www.ecologyandsociety.org/vol12/iss2/art14/

DeZure, D. (2010). Interdisciplinary pedagogies in higher education. In R. Frodeman, J. T. Klein, and C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 372 -386). Oxford: Oxford University Press.

Ecklund, E. H. (2010, September 3). What's the big idea?. *The Chronicle Review*, B8-B9. Retrieved from http://chronicle.com/article/Whats-the-Big-Idea-/124277

Graybill, J. K., Dooling, S., Shandas, V., Withey, J., Greve, A., and Simon, G. L. (2006). A rough guide to interdisciplinarity: Graduate student perspectives. *Bioscience*, *56* (9), 757-763. Retrieved from http://www.jstor.org/stable/4099634

Graybill, J. and Shandas, V. (2010). Doctoral student and early career academic perspectives. In R. Frodeman, J. T. Klein, and C. Mitcham (Eds.), *The Oxford handbook of interdisciplinarity* (pp. 404-418). Oxford: Oxford University Press.

> Offers perspectives on collaborative interdisciplinary research from graduate students at the University of Washington's Urban Ecology IGERT (Integrative Graduate Education Research and Training) program. Describes the program and three main stages in the development of interdisciplinary scholars in the program. Also provides six recommendations for improving such interdisciplinary research and training programs.

Haynes, C. (Ed.). (2002). *Innovations in interdisciplinary teaching*. ACE/ORYX Series on Higher Education. Westport, CT: Oryx/Greenwood Press.

Hurtado, S. and Sharkness, J. (2008, September-October). Scholarship is changing, and so must tenure. *Academe, 94* (5), 37-39. EJ814351. Retrieved from http://www.jstor.org/stable/40253690

> Argues that higher education must develop faculty review processes that recognize innovative research. Asserts that the sustainability of the tenure system depends on its capacity to adapt to changes in scholarship.

Interdisciplinary Studies at Duke University. Office of the Vice Provost for Interdisciplinary Studies. Duke University. Retrieved from https://interdisciplinary.duke.edu

Klein, J. T. (1990). *Interdisciplinarity: History, theory, and practice*. Detroit, MI: Wayne State University Press.

Lyall, C., Bruce, A., Tait, J., and Meagher, L. (2011). Charting a course for an interdisciplinary career. In *Interdisciplinary research journeys: Practical strategies for capturing creativity* (pp. 103-136). London: Bloomsbury Academic.

> Explores the multiple paths that faculty can take towards an interdisciplinary career, identifying the risks and benefits for faculty. Provides questions, case studies, and advice for self reflection and identifies non-academic paths in government and industry for career interdisciplinarians. Also provides advice on evaluating and promoting interdisciplinary research. Only tangentially addresses university tenure and promotion policies.

Plank, J., Feldon, D., Sherman, W., and Elliot, J. (2011, May-June). Complex system, interdisciplinary collaboration, and institutional renewal. *Change*. Retrieved from http://www.changemag.org/Archives/Back%20Issues/2011/May-June%202011/institutional-renewal-abstract.html.

> Focuses on the challenges of interdisciplinary collaboration within research-intensive institutions and the contradictions inherent in these institutions, which often make interdisciplinary research and scholarship hard to do.

Rhoten, D. and Pfirman, S. (2007). Women in interdisciplinary science: Exploring

preferences and consequences. *Research Policy, 36*, 56-75.

> Focuses specifically on female faculty engaged in interdisciplinary and team science, exploring the oft-cited expectation that women may be more likely than men to engage in interdisciplinary research. Explores learning styles, work preferences, and career behaviors of interdisciplinary scientists in the context of gender, race and ethnicity. Examines how research preferences and professional consequences of interdisciplinary science in an atmosphere of increased federal and local funding for interdisciplinary research and increased participation by women and minorities. Does not deal explicitly with tenure and promotion guidelines.

See also sections of the AIS website, including sections on the Scholarship of Interdisciplinary Teaching and Learning as these may be useful for faculty going up for tenure and promotion [http://wwwp.oakland.edu/ais/resources/scholarship/], Peer Reviewed Syllabi [http://wwwp.oakland.edu/ais/resources/syllabi/], and the Reprints and Reports tab of the Publications section of the AIS website, where there are materials on interdisciplinary syllabus design and teaching; on interdisciplinary pedagogies, see DeZure and Haynes [2002]; see the material about interdisciplinary teaching on the website of the Science Education Resource Council at Carleton College [http://serc.carleton.edu/sp/library/interdisciplinary/index.html]; see San Francisco State University's web page on interdisciplinary teaching [http://ctfd.sfsu.edu/feature/top-ten-suggestions-for-interdisciplinary-teaching]; see the publications list for the Interdisciplinary Studies Project, part of Project Zero from the Harvard Graduate School of Education [http://www.interdisciplinarystudiespz.org/pubthree.html].