

**COLLEGE OF ARTS AND SCIENCE
DEPARTMENT OF PHYSICS AND ENGINEERING PHYSICS**

CRITERIA AND STANDARDS

1. General Criteria and Evaluation Methods

The following are the general departmental criteria and evaluation methods that are used for evaluating candidates in each of the recognized categories appropriate in this department. The department's expectations of the candidate in each category are outlined in: Section 2 "Renewal of Probation", Section 3 "Tenure at the Assistant Professor Level", Section 4 "Promotion to Associate Professor or Tenure at the Associate Professor Level", Section 5 "Promotion to Full Professor or Tenure at the Full Professor Level", and Section 6 "Criteria for Special Salary Increase".

1.1. Academic Credentials

The normal academic requirements for an appointment in the Department of Physics and Engineering Physics are a Ph.D. (or equivalent) in physics or closely related field from a recognized university in addition to some experience in research and (possibly) teaching. Appointments to tenure-track positions are made at the Assistant Professor level or higher. This condition would normally be met at appointment.

Some positions in the Department of Physics and Engineering Physics stipulate at the time of hiring that the candidate be eligible for accreditation as a Professional Engineer. For such positions the candidate must show significant progress towards achieving P. Eng. Accreditation at the time of their tenure decision.

1.2. Teaching Ability and Performance

Satisfactory performance in teaching will be established if the Department obtains information that affirms that:

- the candidate's lectures are well prepared and delivered at an appropriate level,
- the lecture material follows the approved course outline and calendar description,
- the candidate is available to students for questions and discussion, and
- the examinations and/or other assessments are fair and equitable.

Such information may be provided through the various channels outlined below.

- Students complete a standard course/professor evaluation. This includes a College-approved questionnaire and the submission of signed comments from the students. The questionnaire results, including relative ranking within the department, and the student comments (without the students names) are given to the instructor.

- As part of peer teaching evaluation, the candidate's classroom performance will be observed on several occasions by one or two senior professors (sometimes tenure candidates may be asked to team-teach a class with a senior professor for the purpose of evaluation and teaching experience). A peer evaluation report will consist of classroom visitations and review of course contents and teaching dossier.
- Candidates for tenure are required to present a seminar to Faculty and/or to give a public lecture. The Department Head solicits opinions from senior faculty concerning the candidate's performance.
- The receipt of a teaching award will also be taken as an indicator of teaching excellence.
- Spot checks on course content may occasionally be made by the Department Head.
- When appropriate, student complaints made to the Department Head, directly or indirectly through the Liaison Committee, will be discussed with the professor in charge of the class. A follow-up will be made in succeeding years to determine if adjustments have been made.
- Recognition will be given to work dedicated to teaching, such as publications or conference presentations by the candidate on physics teaching pedagogy.

1.3. Knowledge of Discipline and Field of Specialization

Candidates will be rated in this category with the same criteria as used for category 4, "Research, Scholarly and Artistic Work" since it is felt that these categories are not separable for Physics and Engineering Physics.

1.4. Research, Scholarly and Artistic Work

Performance in research will be judged with reference to the candidate's activities in the following areas:

- Refereed publications in recognized journals.
- Research support in the form of grants or contracts.
- Presentation of papers at conferences, in particular invited papers.
- Invited seminars at other institutions.
- Participation with national and/or international committees or associations involved with the promotion or practice of research in the candidate's field of specialization.
- Publication of internal reports that are solicited by external researchers.
- Book publication.
- Letters from external referees are required.

A few words of further explanation on some of the above areas are offered in the following paragraphs.

The **publication of research** in internationally recognized refereed journals is one of the main criteria used in evaluating a faculty member's performance in research. Factors such as the scope and impact of the article, and the journal in which it is published will be considered. Candidates may also use citation information to support their case.

Some physics journals that are internationally recognized and pertinent to research activities in the Department are listed in the Appendix. Acceptance of a research paper for publication in any of these journals and other recognized journals with comparable quality will be considered as a noteworthy contribution to the subject. Although publication is of prime importance, the Department shall not overlook the stimulation and leadership that a faculty member may provide in fostering competent and noteworthy on-going research. This may be vital to the securing of research grants and attracting researchers and students from other countries and institutions.

In the case of multiple-authors of a paper, the candidate will be asked to signify his/her **contribution** to the work. It is recognized that physics research, whether experimental or theoretical, is often a team effort. Publications resulting from such team-efforts naturally bear the names of all members of the team.

Refereeing and editorship: Articles sent from well-recognized journals to a faculty member for refereeing will be taken as recognition of the individual's stature. Invitations to serve as an external referee for a Ph.D. thesis and faculty promotion attests to the candidate's recognition in their field. Serving as editor or on editorial board of a major physics journal also reflects the person's reputation in the field.

Publication of a **book** whether at undergraduate, graduate or specialized level is an important accomplishment. The amount of effort going into such a project is certainly equivalent to the publication of a number of papers.

When a faculty member is asked to serve on an **executive board of a nationally or internationally recognized institution**, it is because the member has become recognized as a scientist of some stature in his/her field. To serve on an executive committee of major physics or engineering associations, or to be convenor of a major international symposium, all reflect the collegial respect of the individual and count as meritorious service beyond that expected of a faculty member. The same holds true for faculty serving on Grant Selection Committees of the Natural Sciences and Engineering Research Council and other national and international granting agencies.

Research awards from, and election to fellows in, professional societies constitute peer recognition of research accomplishments.

1.5. Administration

Faculty members are expected to serve on departmental committees as well as college and council committees. An attempt will be made to assess the amount of work entailed in serving on a committee although this is not always easy. It will not be assumed automatically that serving on a council or college committee is more important than serving on a departmental committee, as the latter may be the more onerous.

Considerable importance will be attached to positions that concern the administration of research groups. Currently, in the Department of Physics and Engineering Physics, there are two such positions:

- Chair, Institute of Space and Atmospheric Studies (ISAS)
- Director, Plasma Physics Laboratory (PPL)

It is recognized that faculty who fill these positions carry a substantial load and although efforts are made to reduce the teaching loads, it is never enough to offset the extra work involved.

1.6. Public service and Contributions to Academic and Professional Bodies

Recognition will be given for outreach activities that publicize the understanding of physics, engineering physics and science in general to a wider audience such as the general public and those in the school system.

Recognition will also be given to faculty who serve for nationally and internationally recognized institutions as discussed in section 1.4 above.

2. Renewal of Probation

The criteria for "Tenure at the Assistant Professor Level" (Section 3), "Tenure at the Associate Professor Level" (Section 4), or "Tenure at the Full Professor Level" (section 5) are to be used here, except that the term "meeting the standard" is to be interpreted as "showing appropriate progress towards meeting the standard by the time a tenure decision is to be made" and that evaluation by external referees is not required.

3. Tenure at the Assistant Professor Level

3.1. Teaching

Our expectations are for a satisfactory performance in teaching as determined by the methods outlined in Section 1.2 above. This must include at least two peer evaluations of classes taught by the candidate. The candidate is encouraged to assemble a teaching dossier of information that would support the case that he/she is performing satisfactorily in the classroom.

3.2. Research & Scholarly Work

Candidates for tenure must have a serious commitment to research and provide evidence that their research is sufficiently sound. Such evidence is provided by the information outlined in section 1.4 but should at least include publications of research work in recognized refereed journals and evidence of research support. The quality of research will be assessed by at least three professors at arm's length drawn from comparable Institutions. (One of the three referees may be an associate professor.)

3.3. **Administration**

Service in departmental, college or council committees is not required; it is generally expected that tenure candidates at the assistant professor level will devote most of their efforts to teaching and research. Candidates are expected to be involved in departmental matters through attendance and participation in departmental meetings and committee meetings.

4. Promotion to Associate Professor or Tenure at the Associate Professor Level

4.1. **Teaching**

The standard of teaching performance outlined under "Tenure at the Assistant Professor Level" will be applied in the present instance. In addition, an active and effective role in graduate student supervision will attest to that member's abilities in training and motivating students.

4.2. **Research & Scholarly Work**

Evidence of an on-going active research program is required. This is judged by the information outlined in section 1.4. The evidence should show that the candidate has a mature research program that will be maintained into the future. For tenure consideration at the Associate Professor level, letters from three external referees at arm's length, who hold full professorship at other comparable institutions, will also be required.

4.3. **Administration**

It is expected that the candidate will have assumed an increased responsibility in departmental and university affairs through service on committees. Lack of strong committee participation would not hold back promotion provided the research and/or teaching categories are of superior quality.

5. Promotion to Full Professor or Tenure at the Full Professor Level

5.1. **Teaching**

In addition to the criteria listed under "Promotion to Associate Professor", it is desirable that the candidate will have served on the Departmental committees associated with program content and development and, thus, to have obtained an overall view of the department's course structure.

Recognition will be given to work dedicated to teaching, such as the publishing of physics textbooks and monographs, the creation of internet courses and materials, or the writing of papers in refereed journals concerned with physics pedagogy.

5.2. **Research & Scholarly Work**

A candidate must have a record demonstrating active, mature, independent research and scholarly activity, which has contributed substantially to the development of the candidate's field. The

quality and innovative nature of this work will be considered, not just quantity of publications. The publication of papers in recognized journals, or the publication of books in specialized areas of physics are all regarded as clear evidence that the candidate has met the requirement. The quality of research will be assessed by three external referees at arm's length who hold full professorship at other comparable institutions.

Other criteria that may be used to assess the candidate's research are detailed in section 1.4.

5.3. **Administration**

Willingness to participate effectively in departmental committees is expected. The candidate should also be willing to perform committee work at the college and university levels and to engage in public service activity if called upon to do so. Public service might include the holding of executive positions in professional societies, serving on Royal Commissions, and editorships. An outstanding contribution in administration or public service (for example, authorship of a commissioned report) might be judged as a scholarly contribution.

6. Criteria for Special Salary Increase

Special salary increases or merit increases will be recommended for faculty members whose service in a year, or cumulatively for a number of years, is of a standard above what is normally expected for a person in that rank. What is normally expected has already been indicated under the criteria for "Promotion to Associate Professor" and for "Promotion to Full Professor". It is recognized that more is expected of a professor than of an associate professor and that this extra burden usually arises from extra administrative duties.

In evaluating a faculty member for merit increase, it is recognized that more is expected of a professor than an associate professor, and more of an associate professor than of an assistant professor. Also, consistently excellent performance in one or more areas for an "accumulated period" is highly regarded in the department.

The Department Head will attempt (with help from colleagues) to judge the merit of each faculty member in light of all the factors listed above and make recommendations to the College Review Committee after serious and extended deliberations.

6.1. **Teaching**

The Department Head will be involved either directly or indirectly with all facets of teaching, and is given the responsibility (with selected colleagues) of judging a candidate's teaching merit. Any of the various sources of information outlined in section 1.2 may be used to make the candidate's case. The faculty member is encouraged to assemble a teaching dossier of information that would support their case for merit based on teaching.

6.2. **Research and Scholarly Work**

The judgement on whether a faculty member's research contribution is of a superior nature for the time period under review will be made by considering the criteria detailed in section 1.4.

6.3. Administration

Administrative work beyond that which is appropriate for a faculty member at their level will be required for consideration for a special merit increase.

Approved by the Department on December 7, 2000

Appendix

Physics Journals

General Physics Journals

Annals of Physics	Physics Essays
Applied Physics Letters	Physics Letters A
Canadian Journal of Physics	Physics Report
Europhysics Letters	Progress in Theoretical Physics
Journal of Applied Physics	Review of Scientific Instruments
Journal of Physics A, D	Reviews of Modern Physics
Nature	Science
Physical Review Letters	

Astronomy, Astrophysics, and Gravity

Astronomy and Astrophysics	Monthly Notices of Royal Astronomical Society
Astrophysical Journal	Astroparticle Physics
Classical and Quantum Gravity	
General Relativity and Gravitation	

Nuclear and Particle Physics

European Physical Journal A, C, D	Nuclear Instruments and Methods A
International Journal of Modern Physics A, D	Nuclear Physics A
Journal of High Energy Physics	Nuclear Physics B
Journal of Physics G	Physical Review C and D
Modern Physics Letters A	Physics Letters B
	Progress in Nuclear Physics

Plasma Physics

IEEE Trans. Plasma Science	Physical Review E
Journal of Plasma and Fusion Research	Physics of Plasmas
Journal of Plasma Physics	Plasma Physics and Controlled Fusion
Nuclear Fusion	Plasma Sources Science and Technology

Condensed Matter Physics

Applied Physics A	Journal of Polymer Science
Applied Surface Science	Journal of Vacuum Science and Technology A & B
European Physical Journal B	Nuclear Instruments and Methods B
Journal of Chemistry and Physics of Solids	PhysChemComm
Journal of Electron Spectroscopy and Related Phenomena	Physica C: Superconductivity
Journal of Low Temperature Physics	Physical Review B
Journal of Materials Chemistry	Solid State Communications
Journal of Materials Science	Surface Science
Journal of Physics: Condensed Matter	Surface Science Reports
	Thin Solid Films

Space, Atmospheric and Planetary Physics

Advances in Space Research	Journal of Atmospheric Science
Annales Geophysicae	Journal of Geophysical Research
Applied Optics	Journal of Quantitative Spectroscopy and Radiative Transfer
Geomagnetism and Aeronomy	Planetary and Space Science
Geophysical Research Letters	Radio Science
Icarus	Solar Physics
Journal of Atmospheric and Solar Terrestrial Physics	Space Science Reviews

Physics Teaching

American Journal of Physics

Physics Teacher

The above is not an exhaustive list, but all have world-wide recognition in their respective physics communities.