Guidelines for Accreditation
of
Graduate Educational Programs in Medical Physics

Commission on Accreditation
of
Medical Physics Educational Programs

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Preface

The Commission on the Accreditation of Medical Physicists Educational Programs (CAMPEP) is a nonprofit organization whose objectives are the review and accreditation of educational programs in medical physics. This document describes the procedure for application to CAMPEP for accreditation of a graduate educational program in medical physics, a process requiring a comprehensive, unbiased evaluation. Institutions are encouraged to suggest additions and modifications to this procedure where appropriate to improve the accreditation process.

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1 ACCREDITATION

1.1 Definition and Scope

Accreditation of a graduate educational program in medical physics is recognition that the program conforms with standards approved by the Commission on the Accreditation of Medical Physicists Educational Programs (CAMPEP). These standards are set such that the program will equip students with appropriate skills to pursue a career in medical physics. Such standards require that established levels of educational opportunities are offered by the program and that the program curriculum is up-to-date, inclusive, and challenging to the students. In reviewing a program, CAMPEP pays special attention to the overall quality of the program as judged by the number and competence of the teaching staff; teaching loads, rigor, breadth and depth of instructional offerings; adequacy of facilities and supporting personnel; the aptitude and commitment of its students; and the performance of its graduates.

CAMPEP has established guidelines for graduate educational programs (Master of Science and Doctor of Philosophy degree or equivalent) in medical physics and for the evaluation of such programs by the Commission. Reasons for significant deviation from these guidelines must be satisfactorily justified by the institution requesting accreditation.

CAMPEP accreditation of a program does not address the clinical competency of individual graduates. Certification that an individual Medical Physicist has demonstrated a minimum level of professional knowledge is currently available from the American Board of Radiology (ABR), the American Board of Medical Physics (ABMP) and the Canadian College of Physicists in Medicine (CCPM). These certification agencies are not concerned with the accreditation of educational and training programs in medical physics.

1.2 Rationale

Throughout the history of medical physics in North America there has been a number of pathways for individuals to enter the field of medical physics. Initially these pathways included formal education in physics or a related science combined with on-the-job training in a preceptorship relationship with one or more established medical physicists. More recently, medical physics programs have become established in academic institutions. Differences in these programs, together with the variety of alternate entry paths still available to persons interested in medical physics, are recognized as one of the strengths of medical physics in North America. However, this diversity also necessitates that educational and clinical training standards for entry into the field of medical physics be established and maintained.

2 EVALUATION PROCESS

The CAMPEP Board of Directors is the governing body for the accreditation process. The CAMPEP Graduate Education Program Review Committee (GEPRC) is responsible to the CAMPEP Board of Directors for reviewing medical physics graduate education programs seeking accreditation and for recommending action following the evaluation process. The CAMPEP Board reviews the recommendations of the GEPRC and reports to the institution all actions by CAMPEP regarding program accreditation.

CAMPEP is always willing to discuss with chairpersons of medical physics, radiology, radiation oncology and nuclear medicine departments and other university administrative offficials all aspects of clinical training and education in medical physics. If requested, CAMPEP will offer suggestions and guidance to those institutions wishing to improve their clinical training and educational programs in medical physics.

2.1 Accreditation Application

The initial application submitted to the chair of the GEPRC of CAMPEP must include the following:

Official Request for Accreditation and Evidence of Commitment

A letter from the principal administrative officer of the institution inviting CAMPEP to conduct an evaluation of the medical physics graduate education program is required. An institution's request for its program to be evaluated by CAMPEP is totally voluntary and, as such, the institution agrees to abide by the decision of the CAMPEP Board of Directors.

University Accreditation

Institutions offering graduate medical physics educational programs must be accredited by a nationally recognised accrediting body. This accreditation is important since an educational program in medical physics requires broad institutional support in areas such as physics, mathematics, anatomy, biochemistry, physiology, radiobiology, therapeutic radiology, diagnostic radiology, and nuclear medicine. A copy of this accreditation certificate must be included with the application.

Demonstration of Stability

The program should have documented stability, be of adequate size, with adequate faculty and staff, appropriate curricular offering, and sufficient facility resources. A minimum requirement is that a program have at least five graduates in the previous three years. In addition, at the beginning of the current academic year, a minimum of 8 students should be enrolled in its M.Sc. and/or Ph.D. programs and at least 50% of these students should have been in the program for at least one year.

2.2 Steps Involved

Provided that the institution applying for accreditation satisfies the preliminary requirements listed above, the accreditation process involves seven steps.

1. The preparation of a self-study evaluation by the institution applying for accreditation. The primary purpose of the self-study is to document the operation of the program. This document is the primary vehicle for the CAMPEP's evaluation of a program applying for accreditation. Secondarily, the self-study should provide the information for a program to critically evaluate itself and to produce goals for its improvement. (The self-study is discussed in detail in Section V of the Guidelines. The official request and institutional accreditation documentation should be contained in the self-study in an appendix. The demonstration of stability should be presented in the self-study.) The self-study evaluation shall be sent to the chairman of the CAMPEP Graduate Education Program Review Committee. Fully electronic submission is required to reduce handling costs and expedite distribution. The fee for accreditation is available on the web-site at www.campep.org. A check for that amount should be made out to CAMPEP and enclosed with the self-study.

2. The review of the self-study by CAMPEP.

3. Any questions or concerns raised during this review are communicated to the graduate program director for a response.

4. When all questions or concerns raised during the review of the self-study have been answered or resolved, a site visit is scheduled. Site visits are always scheduled for first time applicant institutions but may not be deemed necessary for institutions being re-evaluated. In all cases, institutions applying for reaccreditation will be visited, at the least, on every other occasion on which they apply for reaccreditation (i.e., at least once every ten years).

5. Immediately following a site visit, the CAMPEP site visit team prepares a summary with appropriate recommendations for submission to the CAMPEP Board of Directors.

6. The site visit team's summary and recommendations, together with the self-study evaluation and all associated correspondence, are submitted to the CAMPEP board of Directors for consideration.

7. The resulting recommendation of the CAMPEP Board of Directors is communicated to the applicant institution.

2.3 On Site Program Review

2.3.1 Purpose and Structure

Provided the self-study and the program director's response are found to be consistent with the Guidelines, a site visit is always scheduled for first time application institutions. Institutions applying for reaccreditation will be visited at least once in any ten year period. The site visit requires one or two days during a regular institutional period. The dates are scheduled so that they are mutually convenient to the site visit team and the medical physics program director. A time is selected that will permit the members of the site visit team to meet with one or more of the principal administrative officials of the institution, the faculty, and the students.

The purpose of the site visit is to examine selected areas of the program identified in the self-study review where questions may exist; to meet and talk personally with faculty members, students, and administrative officials; to observe the adequacy of facilities; to assess the aptitude and commitment of students and faculty; to observe the general educational and scientific environment at the institution; and to obtain any additional data that CAMPEP needs for its evaluation.

The site visit team should be provided with a list of the records generated by the medical physics programs including, but not limited to, databases, application records, and transcripts. For each set of records, the list shall include the description, location, method of access, time to access, and duration that records are stored. Any records to which the site-visit team has legal access should be available for review at their request. Also available for review to the site-visit team should be theses and dissertations produced by the program, and the course exams and qualifying exams for the current and preceding academic year.

2.3.2 Site Visit Team Composition

The site team is generally composed of two or more members of the CAMPEP Graduate Educational Program Review Committee. The members are experienced educators and scientists thoroughly familiar with CAMPEP's criteria and knowledgeable about both administrative and technical aspects of conducting successful programs. In the selection of members of the site visit team for a particular on-site evaluation visit, every effort is made to eliminate any conflict of interest or bias. For instance, a graduate of the institution under evaluation, or a person having a close and continuing relationship with the institution, would not be chosen to assist in the visit and evaluation. Neither would one be selected who is a faculty member at an institution in the same immediate geographical area nor from one having any substantial number of its graduates on the faculty at the institution being evaluated.

2.4 Action Following Evaluation

The actions taken by CAMPEP following an initial evaluation are:

(1) Accreditation, (2) Deferral or (3) Accreditation Withheld.

A program is accredited if it meets the spirit and substance of the criteria established by CAMPEP for graduate education in medical physics. Accreditation is granted for up to five years. In deferral, a final decision is postponed until specific additional information is provided or to allow an adequate period of time for the institution to implement planned or suggested improvements in the program. Accreditation of the program is withheld if the program does not meet CAMPEP's criteria nor does it appear that program changes could be achieved within a reasonable period of time to qualify for accreditation.

In the event of accreditation, the name of the institution then appears on the list of colleges, universities, and/or medical institutions whose programs have been accredited by CAMPEP. The list is published in the AAPM Directory and on the CAMPEP web-site and will be included in CAMPEP's annual report. CAMPEP will also provide a certificate of accreditation.

3 GUIDELINES FOR SELF-STUDY

Topic	Maximum Length
I Program Goal and Objectives	***1 Page***
II Program Evolution and History	***1 Page***
III Program Structure and Governance	***2 Pages***
IV Curriculum	***6 Pages***
A Degree Requirements	
B Design and Content	
C Sample Academic Plans	
D Evaluation of Curriculum	
V Students	***6 Pages***
A Admissions	
B Recruitment Efforts	
C Enrollment	
D Evaluation of Student Progress	
E New Student Orientation	
F Safety	
VI Resources	***3 Pages***
A Faculty	
B Finances	
C Facility	
VII Future Plans	***2 Pages***
A Summary of Strength and Needs	
B Further Developments and Improvement	
Appendices	
A Letters of Invitation and Institutional Commitment	
1 Principal Administrative Officer of the Institution	
2 Departmental Chairman	
B Documentation of Institutional Accreditation	
C Course Summaries	
D Program Graduates	
E Faculty Biographical Sketches and Program Roles (no more than 5 pages for each faculty member).	

I Program Goals and Objectives

The objective of a program must be clearly formulated. It is essential that the program prepare its students (1) for further education, teaching, and research in medical physics, and (2) to assume appropriate responsibilities in the clinical practice of medical physics under the supervision of a certified medical physicist or to enter a medical physics residency program in at least one subspecialty (radiation oncology, diagnostic radiology, or nuclear medicine).

II Program Evolution and History

A brief history of the program's evolution including faculty, staff, and students should be presented. Education occurs best in a stable and supportive environment. Moreover, program development will produce an evolution in the depth and breadth of training. If an institution is preparing a self-study in maintenance of its accreditation, significant changes in the program since the previous self-study should be noted here and described in more detail in the appropriate section of the self-study.

III Program Structure and Governance

The accreditation review will assess the stability and continuity of the organizational structure in which the training program is conducted. The self-study should delineate relationships to other programs, particularly other academic programs, that serve to provide students with the necessary knowledge and broad understanding of the fundamentals of medical physics. The relationship to clinically oriented programs, such as residency training programs for physicians, should be described.

The position of the medical physics program within an institution shall be clearly defined. The academic organization, such as the status of the faculty members in the program, the process by which the faculty that teach and direct graduate student education are approved, and the procedure for granting degrees are all pertinent. The process and frequency of institutional review should be noted together with the rights of the faculty vis-à-vis the institutional desires. Any collaborative arrangements among departments shall be specified. If several departments participate in the program, the role and commitment of each should be explained. Likewise, the access to clinical facilities and equipment should be described.

The program shall be headed by a program director responsible for coordinating the faculty, recruiting students, advising the students, and evaluating and promoting the program. The position of the program director in the academic and clinical organization is of key importance and must be explained, together with the relationship of the key director to other participating individuals, groups, and organizations. The process by which the program director is chosen should be noted.

The mechanism by which the faculty is approved by the program should be discussed along with the means by which the direction and content of the program is governed by the faculty. Communication amongst the faculty is considered key in any program. Faculty committees and meetings should be listed and their purpose defined. The process by which the various committees are established and committee members chosen should be described.

IV Curriculum

A Degree Requirements

The requirements for graduation from the program shall be defined. This shall include didactic curriculum, (e.g., lecture and laboratory) method of clinical training, (e.g., clinical rotations) and research training (e.g., special project, thesis, or dissertation). In addition, any other requirements for graduation (e.g., minimum grade point average or maximum time for graduation) should be stated.

B *Design and Content*

The curriculum should be consistent with recommendations presented in AAPM Reports Number 2, "Training Programs in medical physics," and Number 79 "Academic Program Recommendations for Graduate Degrees in Medical Physics." Curricula will be evaluated with regard to intent, as opposed to strict adherence to these recommendations. The self-study document shall include a summary of each course offering attached as an appendix.

During the site visit, examples of homework assignments should be available for review upon request together with faculty evaluations of students and students' evaluations of the course and instructor.

C Sample Academic Plans

This section should include sample academic plans that are distributed to incoming students. Since programs include required and optional courses and students do not always enter the programs in synchrony with the course offerings, these plans should document an adequate frequency of courses. If some required courses are offered every other year, then academic plans for students entering on even or odd years should be included. The provision for individual student needs and interests should be discussed.

D Curriculum Evaluation and Modification

The process by which the institution approves the curriculum and course content as well as changes in the curriculum and course content should be described. The methodology for the evaluation of courses by the students and faculty should be described along with the frequency of evaluation and the mechanism for change.

V Students

A Admissions

The application packet sent to prospective students should be described. This packet should include information on the field of medical physics, a description of the institution's medical physics program, information on the admission standards concerning degrees, undergraduate coursework (and graduate coursework, if appropriate), GPA, GRE scores, TOEFL scores, etc., and sufficient information on the application process for the student to make an application to the program.

Students entering a medical physics graduate program shall have acquired a strong foundation in basic physics. This should be documented by either an undergraduatue degree in physics or a degree in a related engineering or physical science with course work equivalent to a minor in physics (includes at least three upper level undergraduate courses). If applicants with deficiencies in their physics background are conditionally admitted to the program, the provision for remedial training in physics shall be provided and should be described in the self-study.

The method of processing a student application shall be described, including the evaluation process and the method of informing students of action taken on their application. Application due dates and an admission process time line should be specified.

Admission policies shall be nondiscriminatory except as related to standards for academic qualifications. The quality of the entering student shall be such that successful completion of the required training is not precluded by inadequate qualifications upon admission. The general aptitude, commitment and qualifications of students will be considered in the accreditation evaluation. The self-study shall provide information about the students admitted to the program for the previous five years. It should include previous degrees, GPA, GRE scores, and any other information that can be easily compared with admission guidelines.

B Recruitment Efforts

Recruitment efforts should be discussed in this section. Each program should have active recruitment efforts which could include contacts with nearby university physics departments or their Society for Physics Students and booths at local meetings of the American Physical Society.

C Enrollment

A medical physics program shall have sufficient numbers of matriculating students so that the program is active and stimulating to the students, and so that they can be provided with a continuity of course offerings. At the beginning of the academic year, a minimum of 8 students should be enrolled in its M.Sc. and/or Ph.D. programs, and at least 50% of these students should have been in the program for at least one year. The latter provides continuity and student tradition. Program capacity shall be clearly stated. A list and status of all students in the program at the beginning of the academic year immediately prior to the self-study shall be provided here. This shall include time of entry into program, name of faculty supervisor, and source of funding.

The average time for full-time students to obtain a Masters degree when entering the program with an appropriate background should be no longer than two years. Good students should be able to complete the program in less time. Similarly, the average time beyond the M.Sc. for Ph.D. students to matriculate should be three years, i.e., a total of five years of graduate study and research. Average matriculation on times greater than these for full time students are indicative of poor program structure and management.

The accreditation commission will consider the professional status and accomplishments of past students, since this outcome is an important indicator of the quality of the program. The ability of graduates to become satisfactorily employed and the results of evaluation of individual graduates by independent organizations (for example, through professional certification) can provide valuable insight into the effectiveness of a program.

D Evaluation of Student Progress and Student-Faculty Interactions

The methods for evaluating student progress shall be delineated. This may include meetings with the program director, dean, or faculty committees. The governance process to handle the progress of students that are not satisfactory and students' grievances should be discussed. The interaction of faculty and students shall be described. Sufficient academic guidance shall be given so that the students graduate in a timely and efficient manner.

E New Student Orientation

It is important that new students are properly oriented upon entry into the program. The self-study should include a description of its orientation process. The incoming student should clearly understand graduation requirements, student administrative procedures, and any other program expectations. The student should be aware of program resource faculty, laboratories, research opportunities, and funding. In general, the student should have a good overview of the program.

F Safety

Students will be working in a radiation and high voltage environment, where the potential exists for bodily injury to themselves and others. Students entering a program will have a background in physics and should be sufficiently aware of potential hazards so that they will not be in any immediate danger. The program should have some introductory safety training in potential dangers of high voltage. The program should have a published set of guidelines and restrictions for using potentially dangerous equipment. The Self-Study shall indicate the program's safety activities.

VI Resources

A Faculty

A biographical sketch of each participating faculty or staff shall be provided in appendix E. The student-to-teacher ratio shall be presented and projected for the immediate future.

B Finances

The primary financial resource required to run a successful graduate education program is student funding. The goal of any graduate education program should be to fund its students 100% of the time at a level typical of graduate student stipends. Listed should be the methods available to finance graduate assistantships and fellowships (e.g. teaching assistantships, research assistantships, or fellowships). Availability of financial aid shall be discussed. The self-study should identify the program's mechanism for assisting students in obtaining funding. The financial burden of a student should be itemized in the self-study. This would include average costs for tuition, books, insurance, housing, and any other costs specific to being a student. The level(s) of student funding, including any benefits (e.g. insurance, tuition, books), shall be identified.

C Facilities

The self-study shall list by category all facilities used by the students. Their location, availability, and specialty shall be indicated. Classrooms should be easily accessible by the student and have adequate capacity for the class size. They should meet modern standards of lighting, ventilation, and comfort and be equipped with adequate visual aids (blackboard, overhead projector, slide projector, television, and video projection equipment).

Student offices should be available, particularly for M.Sc. students for whom a thesis is required and for Ph.D. students. Office space should include an

assigned space to sit. Student offices should be reasonably located, e.g., in or near research laboratories used by the student. Students should have access to adequate office supplies, copying equipment, and computers.

Student laboratories, teaching laboratories, and faculty laboratories accessible to the students shall be listed. These laboratories should be sufficient for academic and research goals of the program. Laboratories should have reasonable recent models of instruments and equipment available to students. Clinical equipment available for research should be indicated. Machine and electronic shops should be accessible, and there should be provisions for maintenance and prompt repair of laboratory equipment and instruments used by the students.

Programs should have adequate clinical facilities. Procedures should be in place (1) to allow the student reasonably short access time to clinical equipment, (2) to provide students sufficient training and technical support to ensure safe and proper use of equipment, and (3) to ensure that equipment is left in the proper state for clinical use the next day.

The institution should have a library with holdings related to the size and nature of the medical physics program and the research activities of staff and students. There should be a minimum of 10 current periodicals, with back runs of no less than 10 years, and a range of other reference materials relevant to medical physics.

VII Future Plans

A Summary of Strengths and Needs

The program review shall conclude with a summary of the program's strengths and needs as perceived by the program itself. The program may receive additional feedback of this type from CAMPEP as part of its evaluation.

B Further Development and Improvements

Based on the program's objectives, the program shall produce a set of goals that, if achieved, would improve the program by capitalizing on its strengths and addressing its needs. Again, the program may receive additional feedback in the form of recommended development from CAMPEP as part of its evaluation.

Appendices

A Letters of Invitation and Institutional Commitment

1 Principal Administrative Officer of the Institution

2 Departmental Chairman

B Documentation of Institutional Accreditation

C Course Summaries

Each summary should include:

(a) Course title, instructor(s), and contact hours;
(b) Frequency and time of offering;
(c) Texts and other materials used;
(d) Course outline indicating time allocated to the different topics;
(e) Method of student evaluation; and
(f) Method of faculty evaluation.
(g) One set of exams;
(h) If laboratory sessions are included, one set of experiments and description of content, and
(i) One student's evaluation of the course and instructor.

D Program Graduates

A table of all program graduates (in reverse chronological order) for at least the previous 10 years (if that old) is required. For each student, provide the following information: degree awarded, semester (quarter) of graduation or completion of degree requirements, length of time in program, medical physics specialty (if applicable), thesis or dissertation title (if any), faculty supervisor, current status or occupation, and board certifications (note: some of this information may be private and require a release).

E Faculty Biographical Sketches and Program Roles

(typically 2 and no more than 5 pages per faculty member). The sketches should include the faculty member's appointments, role in the program, education, training, board certifications, licenses, a one-paragraph description of primary clinical responsibilities and interests, a one-paragraph description of research interests, inter and extramural support for the previous five years, selected publications in refereed journals (highlight those including student research), list of students supervised (include degree, year of graduation, thesis or dissertation title, if appropriate) and currently supervising, list of student committees upon which the individual has served and is currently serving, list of courses taught for previous three years, and list of previous and present administrative committee appointments. The faculty should be categorized by primary areas of specialty in medical physics.

4 MAINTENANCE OF ACCREDITATION

4.1 Re-Evaluation

A certificate of accreditation of a medical physics graduate education program is valid for a maximum 5 year period. ***CAMPEP requires that the institution apply for re-evaluation by 1 June of the last year of the accreditation period***. A re-evaluation is similar to an initial application, the steps involved are the same, a new self-study is required and the fee for re-evaluation is the same as for initial accreditation. The new self-study should follow the outline and content described in Section 5 of the Guidelines. It is the responsibility of the program to inform CAMPEP in the self-study of significant changes to the program that may have occurred during the period of accreditation. After evaluation of the self-study document by CAMPEP, the review team may decide that a site visit is not required for re-accreditation.

4.2 Action Following Re-Evaluation

The actions typically taken by CAMPEP following re-evaluation are:

(1) Accreditation Continued, (2) Probation, or (3) Accreditation Withdrawn.

When the decision of the CAMPEP is for continued accreditation, the program director is notified in a letter that includes any suggestions and recommendations CAMPEP might deem appropriate to promote the continued strength and vitality of the program. If the application for re-accreditation is not successful, CAMPEP may suggest either placing a program on probation or withdrawing accreditation. In either case, the reasons for this action are described in a letter to the program director.

An institution is placed on probationary status prior to any decision to withdraw accreditation. Probationary status occurs whenever significant changes have occurred in the medical physics department and/or program that, in the judgment of CAMPEP, might prevent the institution from offering a program that meets CAMPEP's criteria. If compliance is not achieved within the prescribed period, accreditation of the program is withdrawn.

Accreditation is also withdrawn if, upon completion of the re-evaluation, it is clearly evident that the program does not meet CAMPEP's criteria.

5 CHECKS AND BALANCES

5.1 Appeals of Adverse Decisions

Adverse decisions by the Commission are placement on probation or the withdrawal or denial of accreditation. An institution may petition for review of an adverse decision if it believes that CAMPEP has not adhered to its own established policies and procedures or has failed to consider all of the evidence and documentation presented during the evaluation. The petition should be addressed to the president of CAMPEP and must be sent not less than 30 days following the date of the letter advising the institution of the adverse decision. Moreover, all information supporting the petition must be received by CAMPEP within 60 days of the date of the letter advising the institution of the adverse decision.

Upon receipt of a petition and supporting information, CAMPEP will conduct a review which may include a conference with representatives of the institution if appropriate. CAMPEP will subsequently report its findings to the institution.

5.2 Procedures for Complaints

Any administrative official of an institution, department chairman, faculty member, student, or other person, who disagrees with one or more of the policies or activities of CAMPEP and wishes to present a complaint, should do so in a letter to the president of CAMPEP with appropriate documentation. The same procedure is to be followed should the complaint allege failure of an accredited institution to adhere to CAMPEP's criteria or allege that there is a situation tending to jeopardize the quality and vitality of a program at an accredited institution. It will then be the responsibility of CAMPEP to investigate the matter and to advise the complainant of CAMPEP's conclusions not later than 30 days following CAMPEP's next regularly scheduled meeting.

6 CONFIDENTIALITY OF INFORMATION

Institutions requesting the cooperation of CAMPEP for the evaluation of their graduate medical physics educational programs are expected to provide the Commission with detailed information pertinent to the programs. Institutions on the accredited list of CAMPEP are obligated to do so periodically as one of the conditions for continued accreditation. The information provided and all related discussion and correspondence between CAMPEP and an institution are solely for the confidential use of CAMPEP. In the event an institution appeals a CAMPEP decision, CAMPEP would request permission from the institution to release to the appeal bodies that information necessary for the proper conduct of the appeal.

In its annual reports, CAMPEP identifies those institutions whose programs are currently accredited. These annual reports also summarize statistical information provided by each institution about its medical physics graduates. Otherwise, CAMPEP holds confidential and does not release information about a particular program or evaluation.