State of Rhode Island and Providence Plantations
Council on Postsecondary Education
OFFICE OF THE POSTSECONDARY COMMISSIONER
560 Jefferson Boulevard Suite 100
Warwick, Rhode Island 02886-1304

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Enclosure 5b3.
January 13, 2016

TO: Members of the Council on Postsecondary Education

FROM: Jim Purcell, Ed.D, Commissioner for Postsecondary Education

DATE: January 5, 2016

RE: Notice of Change: Revision of the Master of Science in Medical Physics at the University of Rhode Island

## Background

The University of Rhode Island developed a five-year combined Bachelor of Science in Physics and Master of Science in Medical Physics program, which was approved by the Board of Governors for Higher Education in December 2010. The program is offered in partnership with the Radiation Oncology Department at Rhode Island Hospital, the Warren Alpert Medical School of Brown University, and the Rhode Island Nuclear Science Center. The program was accredited in 2014 by the Commission on Accreditation of Medical Physics Education Programs (CAMPEP). CAMPEP only accredits graduate education programs in Medical Physics and therefore, can accredit a Master in Medical Physics and the master's component of the BS in Physics/MS in Medical Physics program at URI. To remain in compliance with accreditation requirements, the University is now requesting to offer direct entry into the MS in Medical Physics to students with undergraduate degrees in physics or a related discipline; the BS in Physics to the MS in Medical Physics program will continue to be an option at URI. The Medical Physics program is also proposing curriculum revisions in response to accreditation requirements.

## Rationale

The field of medicine is facing a significant shortage of well-trained and qualified medical physicists. The challenge has grown because of the increased use of complex technology in radiation oncology and medical imaging. This is a highly specialized field and the preparation of medical physicists can only be accomplished through multidisciplinary graduate education.

The main objectives of the Master of Medical Physics program are to prepare students for further graduate education and careers in teaching and research and to prepare students for careers as medical physicists, which require successfully passing the American Board of Radiology (ABR) examinations. According to

rules adopted in 2014, students must be enrolled and in good standing or have graduated from a CAMPEP-accredited program to be eligible to sit for the ABR Part 1 Examination. Students who successfully complete the MS in Medical Physics program are eligible to enter a two-year CAMPEP-accredited residency program. The Radiation Oncology Department at Rhode Island Hospital runs a CAMPEP-accredited residency program; URI graduates have a very good chance of being accepted at this or at other residency programs. To be eligible to take Part II of the ABR Examination, students must have passed Part I and completed a CAMPEP-accredited residency. Passing Part III of the ABR Examination leads to eligibility for medical physicists' positions at hospitals. A certified medical physicist with a master's degree earns a median salary of $180,000-$185,000.

**Interinstitutional and Institutional Considerations**

Currently, the only other graduate program in New England that is CAMPEP-accredited is at the University of Massachusetts at Lowell. URI believes that it has a unique opportunity to take the lead in creating one of the first Medical Physics programs in New England by combining the knowledge and expertise in physics, biological physics, and medical physics available at the university, the Rhode Island Nuclear Science Center, and Rhode Island Hospital.

**Program**

The Master of Medical Physics program at University of Rhode Island will have two entry points: Students may enroll in the BS in Physics and apply for the MS in Medical Physics program at the end of their junior year, or students may apply to the masters program after earning a BS in physics or an equivalent degree in engineering with advanced physics courses.

**Curriculum**

The combined BS in Physics and MS in Medical Physics program requires 162 credits; the total number of credits remains unchanged in the revised curriculum. Several courses were modified to better address the knowledge required in the medical physics, and one new medical imaging course was added to meet CAMPEP requirements:

> STA 307 (Introductory Biostatistics) is replaced by STA 411 (Biostatistics II) which is more appropriate for students with a math and physics background.
>
> PHY 610 (Mathematical Methods in Physics II) is replaced by a new course PHY 585 (Advanced Clinical Medical Imaging). Imaging is a required component of medical physics education; the addition of this course content was requested by CAMPEP.
>
> ELE 562 (Biomedical Instrumentation Design) is replaced by PHY 565 (Radiation Detection, Instrumentation and Data Analysis), which has been modified to include topics related to instrumentation in the field of medical physics.
>
> PHY 691 (Advanced Special Topics) is replaced by PHY 591 (Special Problems) since 600-level courses are not a requirement for the MS degree.

In addition to the changes listed above, adjustments were proposed in the following courses:

> PHY 510 Mathematical Methods of Physics I
> PHY 555 Radiation Oncology
> PHY 560 Experimental Methods in Condensed Matter Science

The master's degree requires 12 credits of prerequisites and 41 credits of which no more than 6 credits may be below the 500-level. This is a non-thesis program which requires that at least one course will require a substantial paper involving significant independent study; in addition, students must pass a final oral and written exam. It is expected the program can be completed in two years.

**Students**
The department's goal for the program is 10 students in the MS component of the program.

**Faculty**
Courses in the program are taught by faculty in the URI Physics Department, the Rhode Island Hospital-Brown University Medical School faculty, and the staff at the Rhode Island Nuclear Science Center at the URI Bay Campus.

**RIOPC Review**
When the combined BS/MS program was originally proposed, it was reviewed by an external evaluator as required by Board of Governor's *Regulations Governing Academic Changes in Rhode Island Public Institutions of Higher Education*. The reviewer noted that the program brings together outstanding physics faculty at URI working in collaboration with outstanding faculty at Rhode Island Hospital (RIH). Specifically, he noted that several of the faculty at Rhode Island Hospital are nationally recognized in the field and experienced in teaching Medical Physics and Radiation Oncology Physics. Further, the RIH facility includes state of the art technologies that will benefit students preparing to become medical physicists.

RIOPC staff reviewed the information on the proposed revision of the curriculum and the addition of direct entry into the Master of Medical Physics program which was supplied by the University of Rhode Island. The academic changes presented are within the mission, role and scope of the University of Rhode Island and do not require Council approval.