

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—COURSE CHANGE REQUEST¹

UGPC APPROVAL _____
 UFS APPROVAL _____
 SCNS SUBMITTAL _____
 CONFIRMED _____
 BANNER POSTED _____
 CATALOG _____

DEPARTMENT: PHYSICS	COLLEGE: CHARLES E. SCHMIDT COLLEGE OF SCIENCE
COURSE PREFIX AND NUMBER: PHZ 5304	CURRENT COURSE TITLE: INTRODUCTION TO NUCLEAR PHYSICS
CHANGE(S) ARE TO BE EFFECTIVE (LIST TERM): FALL 2013	TERMINATE COURSE (LIST FINAL ACTIVE TERM):
CHANGE TITLE TO: NUCLEAR MEDICAL PHYSICS CHANGE PREFIX FROM: PHZ TO: RAT CHANGE COURSE NO. FROM: 5304 TO: 6687 CHANGE CREDITS ² FROM: TO: CHANGE GRADING FROM: TO: CHANGE DESCRIPTION TO: This course covers the fundamentals of nuclear physics and its application in the medical field as recommended by the AAPM. At the end of the course the students should have a good understanding of the physics and instrumentation of nuclear medicine.	CHANGE PREREQUISITES/MINIMUM GRADES TO*: Permission of the Instructor CHANGE COREQUISITES TO*: CHANGE REGISTRATION CONTROLS TO: *Please list both existing and new pre/corequisites, specify AND or OR, and include minimum passing grade.
Attach syllabus for ANY changes to current course information	
Should the requested change(s) cause this course to overlap any other FAU courses, please list them here.	Please consult and list departments that might be affected by the change(s) and attach comments. ³

Faculty contact, email and complete phone number:
Th. Leventouri, leventou@fau.edu, 561-297-2695

Approved by: Department Chair: _____ College Curriculum Chair: _____ College Dean: _____ UGPC Chair: _____ Graduate College Dean: _____ UFS President: _____ Provost: _____	Date: _____ _____ _____ _____ _____ _____	1. Syllabus must be attached; see guidelines for requirements: www.fau.edu/provost/files/course_syllabus.2011.pdf 2. Review Provost Memorandum: Definition of a Credit Hour www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf 3. Consent from affected departments (attach if necessary)
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Email this form and syllabus to UGPC@fau.edu one week before the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.



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Professional Master's of Science in Medical Physics (MSMP) Course Syllabus

1. Course title/number, credit hours: RAT 6687 INTRO NUCLEAR PHYSICS, 3 credit hours.

2. Prereq/coreq: Permission of the Instructor.

3. Course logistics

a. Fall Term 2012

b. Notation if online course: N/A

c. Class location and time: SE 101, Mo, We 4:00-5:20

4. Instructor contact information

a. Instructor's name – Dr. Theodora Leventouri

b. Office address – Science & Engineering Bld, SE 43, Room 112

c. Office hours: Mo, We 1-2 SE 112, and open door policy.

d. Contact telephone number – office (561) 297-2695 fax (561) 297-2662

e. E-mail address – leventou@fau.edu

5. TA contact information N/A

6. Course description

Radioactive decay processes, techniques of particle detection and energy measurement, nuclear reactions and scattering experiments, introduction to theories of nuclear structure, fission and fusion processes, charged particle accelerators, and nuclear reactions. A course covering the fundamental principles of nuclear physics and its application in the medical field.

7. Course objectives/student learning outcomes

At the end of this course the students are expected to have a good understanding of: radiation quantities and units, types and sources of ionizing radiation, interactions of charged particles and photons with matter, radioactivity, using the radiation physics knowledge that medical physicists need for efficient and safe dealings with ionizing radiation.

8. Required texts/readings

Textbook: *Physics in Nuclear Medicine*, third edition, S. R. Cherry, J. A. Sorenson, M. E. Phelps (Saunders).

9. Supplementary/recommended readings

Bibliography:

Sources of Journal Articles

American Association of Physicist in Medicine (AAPM)

[http://scitation.aip.org/medphys/Medical Physics](http://scitation.aip.org/medphys/Medical%20Physics)

American Institute of Physics–<http://www.aip.org/ojs/service/html>

10. Course topical outline (15 weeks)

1: Review of Basic Atomic and Nuclear Physics. Modes of Radioactive Decay.

- 1HW: Problems.
 2: Activity, Methods for determining decay factors, Image-Frame decay corrections, Specific Activity, Decay of a mixed radionuclide sample, Parent-Daughter Decay.
 2HW: Questions/Problems.
 3: Radionuclide and Radiopharmaceutical production.
 3HW: Problems.
 4: E1, Gas-filled detectors, Semiconductor detectors, Scintillation detectors.
 4HW: Example problems.
 5: Electronic instrumentation for radiation detectors, cathode ray tube.
 5HW: Questions/Problems.
 6: Nuclear counting statistics, propagation of errors, statistical analysis, statistical tests.
 6HW: Questions/Problems.
 7: Pulse-Height spectrometry with NaI(Tl). Problems in radiation detection and measurement.
 7HW: Questions/Problems.
 8: E2. Counting systems. The Gamma camera.
 8HW: Web reading.
 9: Performance characteristics of the gamma camera.
 9HW: Questions.
 10: Image quality in nuclear medicine. Basic methods for evaluating image quality.
 10HW: Journal Articles reading.
 11: Tomographic reconstruction in nuclear medicine. Single photon emission computed tomography (SPECT).
 11HW: Questions/Web Reading.
 12: E3. Positron Emission Tomography. Annihilation coincidence detection.
 12HW: Questions/Problems
 13: PET detector, data acquisition, clinical applications and research of PET.
 13HW: Journal Articles reading.
 14: Digital imaging in nuclear medicine. Internal radiation dosimetry.
 14HW: Problems.
 15: Radiation safety.
 15HW: Web AAPM reading.
 16: Final Exam.

Exam Dates

- | | |
|--------------|--------------------|
| E1 | Monday, 9/17/12 |
| E2 | Monday, 10/15/12 |
| E3 | Wednesday, 11/7/12 |
| FINAL | Monday, 12/3/12 |

11. Course evaluation method

The letter grade is decided from four exams (25/100 each) including the final. Class participation and literature research are important in determining the letter grade from the grading scale. Additional point will be given to raise the grade to the higher letter grade. Further explanation will be discussed in class.

12. Grading scale

A: 100-92 %

A-: 91-86 %

B+: 85-80%

B: 79-70%

B-: 69-60%

F: <60%

13. Policy on makeup tests, late work, and incompletes

Student meets with the Instructor for arrangements.

14. Special course requirements N/A

15. Classroom etiquette policy (if applicable)

University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions."

16. Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) -- in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all OSD procedures.

<http://www.fau.edu/policies/files/1.13%20Disabilities%20and%20Accommodations%20FINAL%209-18-12.pdf>

17. Honor Code policy statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at

http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf