FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL

UGPC APPROVAL _____
UFS APPROVAL _____
SCNS SUBMITTAL _____
CONFIRMED _____
BANNER POSTED _____
ONLINE _____
MISC _____

DEPARTMENT NAME:
PHYSICS

COLLEGE OF:
CHARLES E. SCHMIDT COLLEGE OF SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX _____**RAT**_____ **COURSE NUMBER** _____**6629**____ **LAB CODE** (L or C) _

(*TO OBTAIN A COURSE NUMBER, CONTACT ERUDOLPH@FAU.EDU*)

COMPLETE COURSE TITLE **Advanced Photon Beam Radiation Therapy**

EFFECTIVE DATE
(first term course will be offered)
FALL 2010

CREDITS: 3

TEXTBOOK INFORMATION:
IMRT, IGRT, SBRT: Advances in the Treatment Planning and Delivery of Radiotherapy (Frontiers of Radiation Therapy and Oncology) **by L. Meyer, D. Kavanagh, J. A. Purdy, R. Timmerman.**

GRADING (*SELECT ONLY ONE GRADING OPTION*): **REGULAR** __X____ **PASS/FAIL** _____ **SATISFACTORY/UNSATISFACTORY** _____

COURSE DESCRIPTION, NO MORE THAN 3 LINES:
This course will cover the physics and clinical application of advanced external beam photon therapies with special emphasis on IMRT (Intensity Modulated Radiation Therapy).

PREREQUISITES W/MINIMUM GRADE:*	**COREQUISITES:**	**OTHER REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL):**
RAT 6628		

PREREQUISITES, COREQUISITES & REGISTRATION CONTROLS SHOWN ABOVE WILL BE ENFORCED FOR ALL COURSE SECTIONS.

*****DEFAULT MINIMUM GRADE IS D-.*

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE:
BOARD CERTIFIED MEDICAL PHYSICIST

Other departments, colleges that might be affected by the new course must be consulted. List entities that have been consulted and attach written comments from each. **NA**

Th. Leventouri, leventou@fau.edu, 561-297-2695
Faculty Contact, Email, Complete Phone Number

SIGNATURES

Approved by:	***Date:***
Department Chair: _____	_____
College Curriculum Chair: _____	_____
College Dean: _____	_____
UGPC Chair: _____	_____
Dean of the Graduate College: _____	_____

SUPPORTING MATERIALS

Syllabus—must include all details as shown in the UGPC Guidelines.

Written Consent—required from all departments affected.

Go to: *http://graduate.fau.edu/gpc/* to download this form and guidelines to fill out the form.

Email this form and syllabus to *sfulks@fau.edu* and *eqirjo@fau.edu* one week ***before*** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website by committee members prior to the meeting.

SYLLABUS

Course name: Advanced Photon Beam Radiation Therapy (3credit hours).
Course number: RAT 6629.
Section number: N/A
Pre-requisites: RAT 6628.
Instructor: Drs. Pella, Horowitz, Leventouri
Office number: SE 112
Telephone: x72695
E-mail: leventou@fau.edu
Required text: *IMRT, IGRT, SBRT: Advances in the Treatment Planning and Delivery of Radiotherapy (Frontiers of Radiation Therapy and Oncology)* by L. Meyer, D. Kavanagh, J. A. Purdy, R. Timmerman. KARGER, 2007.

Bibliography: *A Practical Guide to Intensity-Modulated Radiation Therapy*, by Memorial Sloan-Kettering Cancer Center, 2003.

Intensity-Modulated Radiation Therapy: The State of the Art, by Jatinder R. Palta and T. Rockwell Mackie, editors. Med. Phys. **30**, 3265 (2003).

Modern Technology of Radiation Oncology Volume 2, by Jacob Van Dyk, editor. Medical Physics Publishing, 2005.

Integrating New Technologies into the Clinic: Monte Carlo and Image-Guided Radiation Therapy, by Bruce H. Curran, James M. Balter, and Indrin J. Chetty, Program Directors. Medical Physics Publishing Corporation; 1st edition 2006.

Vendor's user manuals: BrainLab - for SRS, SRT, and SBRT, Varian for IGRT with Eclipse and OBI system, Electta same as Varian.

Course description and instructional objectives: This course will cover the physics and clinical application of advanced external beam photon therapies with special emphasis on IMRT (Intensity Modulated Radiation Therapy). Potentials topics: Istorical perspective of IMRT, Mathematical optimization for the inverse problem of intensity modulated radiation therapy. Physical optimization. Biological indices for evaluation and optimization of IMRT. IMRT delivery using serial Tomotherapy. Static and dynamic MLC IMRT. Functional requirements for IMRT. OBI and localization for IGRT. Radiation shielding for IMRT. Patient localization using optical and ultrasound techniques. Modulated electron therapy. Commissioning and quality assurance for IGRT (the OBI system). Commissioning and quality assurance for SRS (exact rac, Winston-Litz test). Clinical implementation of IMRT, IGRT, SRS, SRT, and SBRT. Monitor unit calculation and plan verification for IMRT. Methods to manage respiratory motion in radiation treatment. Compensated and Intensity Modulated Proton Therapy. Socio-economic Issues of IMRT. The future of IMRT. Novel Uses and applications of IMRT.

At the end of this course the students will be familiar with the current radiation treatment technology and methodologies. They will be able to analyze

properly a new plan and approve or disapprove it. They will be prepared to perform QA, calibrations and acceptance of the treatment planning systems, the MLCs, the OBI systems and all the necessary tools in order to perform IMRT, IGRT, SRS, and all new and advanced radiation therapy available at the present time.

Method of Instruction: The format of the course will be lectures, and reading assignments on RTOG protocols.

Assessment procedures and dates and times of tests and quizzes: 3 tests and the final exam will be given. Test 1, week 3. Test 2 week 6. Test 3 week 9. Final exam.

Grading: A: 100-93 % A-: 92-89 % B+: 88-85% B: 84-80% B-: 79-76% C+: 75-72 % C: 71-68 % C-: 67-65% F: <65%.

Academic integrity: Students are responsible for informing themselves about the Honor Code standards before performing any academic work. The link to more detailed information about academic honesty can be found at:
http://www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.
Scholastic dishonesty includes, among other things: plagiarism, copying other's work during a test, and using notes during a test. Any test or written assignment for which you are caught cheating will be marked as a zero grade, and the incident will be reported in accordance with Honor Code regulations.

Students with disabilities: In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability affecting execution of coursework must register with the Office of Students with Disabilities (OSD) located in Boca in the SU, room 133 (561-297-3880) or in Davie in MD I (954-236-1222), and follow all OSD procedures.