RADIOLOGY

Emeriti: (Professors) Herbert L. Abrams, Gerald Friedland, David A. Goodwin, Henry H. Jones, Albert Macovski, William H. Northway, Lewis Wexler, Leslie M. Zatz

Chair: Gary M. Glazer

Professors: Scott W. Atlas, Richard A. Barth, Christopher F. Beaulieu, Sanjiv Sam Gambhir, Gary M. Glazer, Gary H. Glover, Michael L. Goris, Robert J. Herfkens, R. Brooke Jeffrey, Barton Lane, Ann Leung, Michael Marks, I. Ross McDougall, Robert E. Mindelzun, Michael Moseley, Sandy Napel, Matilde Nino-Murcia, Norbert J. Pelc, Geoffrey Rubin, George Segall, F. Graham Sommer

Associate Professors: Patrick D. Barnes, Francis Blankenberg, Bruce Daniel, Terry Desser, Huy M. Do, Nancy Fischbein, Dominik Fleischmann, Garry E. Gold, Lawrence Hofmann, Debra M. Ikeda, Beverley Newman, Eric W. Olcott, Daniel M. Spielman, Daniel Y. Sze

Associate Professors (Research): Kim Butts-Pauly, Craig Levin, Sylvia Plevritis

Assistant Professors: Sandip Biswal, Frandics P. Chan, Nishita Kothary, William Kuo, Andrew Quon, Kathryn J. Stevens, Joseph Wu, Greg Zaharchuk

Assistant Professors (Research): Roland Bammer, Xiaoyuan Chen, Rebecca Fahrig, Samira Guccione, Brian Hargreaves, David Paik

Web Site: http://www-radiology.stanford.edu

Courses given in Radiology have the subject code RAD. For a complete list of subject codes, see Appendix.

The Department of Radiology does not offer degrees; however, its faculty teach courses open to medical students, graduate students, and undergraduates. The department also accepts students in other curricula as advisees for study and research. Undergraduates may also arrange individual research projects under the supervision of the department's faculty. This discipline focuses on the use of radiation, ultrasound, and magnetic resonance as diagnostic, therapeutic, and research tools. The fundamental and applied research within the department reflects this broad spectrum as it relates to anatomy, pathology, physiology, and interventional procedures. Original research and development of new clinical applications in medical imaging is supported within the Radiological Sciences Laboratory.

COURSES

The following courses are open to undergraduates and graduate students.

RAD 101. Readings in Radiology Research—Prerequisite: consent of instructor.

1-18 units, Aut, Win, Spr, Sum (Staff)

RAD 199. Undergraduate Research—Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

1-18 units, Aut, Win, Spr, Sum (Staff)

RAD 208. Experimental Nuclear Medicine—Computer applications in medicine, particularly in the use of radioisotopes as tracers. Recommended: some knowledge of physiology and calculus.

2 units, Win, Sum (Goris, M)

RAD 220. Introduction to Imaging and Image-Based Human Anatomy—(Same as BIOE 220.) The physics of medical imaging and human anatomy through medical images. Emphasis is on normal anatomy, contrast mechanisms, and the relative strengths of each imaging modality. Labs reinforce imaging techniques and anatomy. Recommended: basic biology, physics, and math.

3 units, Win (Gold, G; Butts-Pauly, K)

RAD 222A. Multimodality Molecular Imaging in Living Subjects I-(Same as BIOE 222A.) Instruments for imaging molecular and cellular events using novel assays. Instrumentation physics, chemistry of molecular imaging probes, and applications to preclinical models and clinical disease management.

4 units, Aut (Gambhir, S; Rao, J)

RAD 222B. Multimodality Molecular Imaging in Living Subjects II—(Same as BIOE 222B.) In vivo imaging techniques and applications to preclinical models and clinical disease management. Focus on cancer research, neurobiology, cardiovascular and musculoskeletal diseases.

4 units, Win (Gambhir, S; Rao, J)

RAD 226. In Vivo Magnetic Resonance Spectroscopy and Imaging—Collections of identical independent nuclear spins are described by the classical vector model of magnetic resonance imaging (MRI); however, interactions among spins, as occur in many in vivo processes, require a more complete description. Physics and engineering principles of these in vivo magnetic resonance phenomena with emphasis on current research questions and clinical applications. Topics: quantum mechanical description of magnetic resonance, density matrix theory, product operator formalism, relaxation theory and contrast mechanisms, spectroscopic imaging, spectral editing, and multinuclear studies. Prerequisites: EE 369B or familiarity with magnetic resonance, working knowledge of linear algebra.

3 units, Win (Spielman, D)

RAD 227. Functional MRI Methods—(Same as BIOPHYS 227.) Basics of functional magnetic resonance neuroimaging, including data acquisition, analysis, and experimental design. Journal club sections. Cognitive neuroscience and clinical applications. Prerequisites: basic physics, mathematics. Recommended: neuroscience.

3 units, alternate years, not given this year

RAD 228. Magnetic Resonance Imaging Programming Seminar—Primarily for students working on research projects involving MRI pulse sequence programming. Introductory and student-initiated topics in seminars and hands-on labs. Image contrast mechanisms achieved by pulse sequences that control radiofrequency and gradient magnetic fields in real time, while acquiring data in an organized manner for image reconstruction. Prerequisites: EE 369B and consent of instructor.

2 units, Aut (Staff), Spr (Hargreaves, B)

RAD 299. Directed Reading in Radiology—Prerequisite: consent of instructor.

1-18 units, Aut, Win, Spr, Sum (Staff)

RAD 399. Graduate Research—Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

1-18 units, Aut, Win, Spr, Sum (Staff)