197T. Tutoring in Biological Sciences (1-5)
Discussion—2-6 hours. Prerequisite: upper division standing and consent of instructor. Assisting the instructor by tutoring students in one of the Biological Sciences' regular courses. May be repeated for credit. (P/NP grading only.)—I, II, III (I, II, III)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. May offer group study courses under this number.

Biomedical Engineering (A Graduate Group)

J. Kent Leach, Ph.D., Chairperson of the Group
530-754-9149

Group Office. 2316 Genome and Biomedical Sciences Facility 530-752-2611;
http://www.bme.ucdavis.edu/graduate/

Faculty

Ralph C. Aldredge, III, Ph.D., Professor
Mechanical and Aerospace Engineering, Physiology

Kyrilos Athanasiou, Ph.D., Distinguished Professor
Biomedical Engineering, Orthopaedic Surgery

Sharon Aviran, Ph.D., Assistant Professor
Biomedical Engineering

Keith Baar, Ph.D., Assistant Professor
Neurology, Physiology, and Behavior

Ramsey D. Badawi, Ph.D., Associate Professor
Radiology, Biomedical Engineering

Craig J. Benham, Ph.D., Professor
Biomedical Engineering, Mathematics

John M. Boone, Ph.D., Professor
Radiology, Biomedical Engineering

Michael H. Bonacorso, Ph.D., M.D., Professor
Radiology

Owen Carmichael, Ph.D., Associate Professor
Neurology, Computer Science

James Chan, Ph.D., Assistant Professor
Pathology and Laboratory Medicine

Abhijit J. Chaudhari, Ph.D., Assistant Professor
Radiology

Ye Chen-Izu, Ph.D., Assistant Professor
Biomedical Engineering, Pharmacology

Simon R. Cherry, Ph.D., Professor
Biomedical Engineering, Radiology

Blaine Christiansen Ph.D., Assistant Professor
Orthopaedic Surgery, Medicine

Colleen Clancy, Ph.D., Professor (Pharmacology)
Fitz Roy E. Curry, Ph.D., Professor (Physiology & Membrane Biology, Biomedical Engineering)

Cristina Davis, Ph.D., Professor
Mechanical and Aerospace Engineering

Yang Du, Ph.D., Professor
Biomedical Engineering

Marc T. Facciotti, Ph.D., Assistant Professor
Biomedical Engineering

Katherine W. Ferrara, Ph.D., Professor
Biological and Agricultural Engineering

David Fyhrie, Ph.D., Professor
Orthopaedic Surgery, Medicine, Biomedical Engineering

Jeffery C. Gibling, Ph.D., Professor
Chemical Engineering and Materials Science

Mark G. Goliger, Ph.D., Associate Professor
Neurology, Physiology, and Behavior

Frederic Gorin, Ph.D., Professor
Neurology

Dominik R. Houdenschild, Ph.D., Assistant Professor
Orthopaedic Surgery

David A. Howes, Ph.D., Professor
Neurology, Physiology, and Behavior

Volkmar Heinrich, Ph.D., Associate Professor
Biomedical Engineering

Johannes W. Hett, Ph.D., Professor (Pharmacology)

Stephen Howell, M.D., Adjunct Professor
Mechanical and Aerospace Engineering

Thomas Huser, Ph.D., Adjunct Professor
Internal Medicine

Sanjay Joshi, Ph.D., Associate Professor
Mechanical and Aerospace Engineering, Orthopaedic Surgery

Thomas Jue, Ph.D., Professor (Biological Chemistry)

Richard A. Kizil, Ph.D., Professor
Electrical and Computer Engineering

Patrick Koehl, Ph.D., Associate Professor
Computer Science

Gerald J. Kost, Ph.D., M.D., Professor (Pathology)

Tonya L. Kuhl, Ph.D., Professor (Chemical Engineering and Materials Science, Biomedical Engineering)

Kit S. Lam, Ph.D., Professor
Biochemistry & Molecular Medicine

J. Kent Leach, Ph.D., Associate Professor
Biomedical Engineering, Orthopaedic Surgery

AngieLouise Louie, Ph.D., Professor
Biomedical Engineering

Laura Marcu, Ph.D., Professor
Biomedical Engineering, Neurological Surgery

Dennis L. Matthews, Ph.D., Professor
Neurological Surgery

Alexander Magliner, Ph.D., Professor (Mathematics)

Christopher J. Murphy, D.V.M., Ph.D., Professor (Surgical & Radiological Sciences)

Jan Nolta, Ph.D., Professor (Internal Medicine)

Stephen O'Driscoll, Ph.D., Assistant Professor
Electrical and Computer Engineering

Tingrui Pan, Ph.D., Assistant Professor
Biomedical Engineering

Atul Parikh, Ph.D., Professor
Biomedical Engineering, Chemical Engineering, and Materials Science

Anthony G. Passerini, Ph.D., Associate Professor
Biomedical Engineering

Jinyi Qi, Ph.D., Professor (Biomedical Engineering)

Bahram Ravani, Ph.D., Professor (Mechanical and Aerospace Engineering)

A. Hari Reddi, Ph.D., Professor (Orthopaedic Surgery, Medicine)

Alexander Rezvani, Ph.D., Professor
Biomedical Engineering

Crystal M. Ripplinger, Ph.D., Assistant Professor (Pharmacology)

David Rocke, Ph.D., Distinguished Professor
Biomedical Engineering, Public Health Sciences

Leonor Saiz, Ph.D., Assistant Professor (Biomedical Engineering)

Narin Sanigklin, Ph.D., Professor
Mechanical and Aerospace Engineering

Michael A. Savageau, Ph.D., Distinguished Professor (Biomedical Engineering)

J. Anthony Seibert, Ph.D., Professor
Radiology

Scott T. Simon, Ph.D., Professor
Biomedical Engineering

Vivek S. Srinivasan, Ph.D., Assistant Professor
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Biomedical Engineering

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Biomedical Engineering

Susan M. Stover, D.V.M., Ph.D., Professor (Anatomy, Physiology and Cell Biology)

J. Anthony Seibert, Ph.D., Professor
Radiology

Ilias Tagkopoulos, Ph.D., Assistant Professor
Computer Science, Genome Center

Yoshikazu Takeishi, M.D., Professor (Dermatology)

Cheemeng Tan, Ph.D., Assistant Professor
Biomedical Engineering

Alice Taranlal, Ph.D., Professor (Pediatrics, Cell Biology and Human Anatomy, Medicine)

Sebastian Wachsmann-Hogiu, Ph.D., Associate Professor (Pathology and Laboratory Medicine)

John Werner, Ph.D., Professor (Ophthalmology)

Jeffrey Walton, Ph.D., Associate Research Physicist (NMR Facility)

Keith R. Williams, Ph.D., Senior Lecturer
Neurology, Physiology and Behavior

Saichiro Yamada, Ph.D., Associate Professor
Biomedical Engineering

Yohei Yokobayashi, Ph.D., Associate Professor
Biomedical Engineering

Emeriti Faculty

Maury L. Hull, Ph.D., Professor Emeritus
Mechanical and Aerospace Engineering, Biomedical Engineering

Graduate Study. The Graduate Group in Biomedical Engineering offers programs of study and research leading to the M.S. and Ph.D. degrees. The programs of study prepare students for professional work in the effective integration of engineering with medical and biological sciences. Research strengths lie in the areas of imaging, tissue engineering and regenerative medicine, sensor and MEMs systems, cellular and molecular mechanics, computational modeling, targeted therapeutics, orthopedic biomechanics, biofluids and transport, and human movement. This broad interdisciplinary program is best suited for students who are capable of and comfortable with considerable independence. Each student, together with an advisor, defines a specific course of study suited to individual needs.

Preparation. The Group regards strong competence in mathematics and engineering as necessary for successful completion of study. Prior course work in these areas is emphasized in the evaluation of applications. Some undergraduate training can be acquired after admission to the Group, but it may require an additional year of study.

Courses. See Engineering: Biomedical, on page 250.

Biophysics (A Graduate Group)

Alexei Stuchebrukhov, Ph.D., Chairperson of the Group
Group Office. 310 Life Sciences; 530-752-4863;
http://biosci3.ucdavis.edu/GradGroups/BPH/

Faculty

Jawdat Al-Bassam, Ph.D., Assistant Professor
Chemistry

Toby Allen, Ph.D., Associate Professor [Chemistry]
James B. Ames, Ph.D., Associate Professor [Chemistry]

Engler, Post Baldwin, Ph.D., Professor
Molecular and Cellular Biology

R. David Britt, Ph.D., Professor [Chemistry]

Tsung-Yu Chen, Ph.D., Associate Professor [Neurology]

R. Holland Cheng, Ph.D., Professor
Molecular and Cellular Biology

Colleen Clancy, Ph.D., Associate Professor
Pharmacology

Daniel L. Cox, Ph.D., Professor [Physics]

Stephen P. Cramer, Ph.D., Professor [Applied Sciences]

Yong-Duan, Ph.D., Professor [Applied Sciences]

Robert H. Fairbairn, Ph.D., Associate Professor
Neurology

Roland Fallier, Ph.D., Associate Professor
Chemical Engineering and Materials Science

Katherine Ferrara, Ph.D., Professor
Biomedical Engineering

Andrew J. Fisher, Ph.D., Professor [Chemistry]

Alla F. Fomin, Ph.D., Assistant Professor
Physiology and Membrane Biology

David Goodin, Ph.D., Professor [Chemistry]
200B. Current Techniques in Biophysics (3)
Lecture—3 hours. Prerequisite: Physics 108 and Biology 101-105; course 202 highly recommended; graduate standing. Introduction to the science and technology of biomedical optics and photonics, with an overview of applications to medicine and the life sciences. Emphasis on research supported by the NSF Center for Biophotonics at UC Davis Medical Center. [Same course as Applied Science Engineering 255 and Biomedical Engineering 255.]

200LA. Biophysics Laboratory (3)—I, II, III. (I, II, III.) Faller, Lebrilla, Krol, Koehl, LaMar, Parmeggiani, Parikh, Raychaudhuri, Russell, Schmid, Siegel, Stuchebrukhov, Yeh
Laboratory—two 18-hour rotations. Prerequisite: course 200 (may be taken concurrently). One five-week laboratory assignment in the research laboratories of Biophysics Graduate Group faculty members. Individual research projects with emphasis on methodological, technical, and experimental design. May be repeated for credit two times. [I, II, III, I, II, III.]

225. Biophotonics in Medicine and the Life Sciences (3)
Lecture/discussion—3 hours. Prerequisite: Physics 108 and Biology 101-105; course 202 highly recommended; graduate standing. Introduction to the science and technology of biomedical imaging. Students choose from the broad bio-physics research venues a research laboratory that matches their interests and career goals. [Same course as Applied Science Engineering 255 and Biomedical Engineering 255.]

200LB. Biophysics Laboratory (6)—II. (II.) Faller, Lebrilla, Krol, Koehl, LaMar, Parmeggiani, Parikh, Raychaudhuri, Russell, Schmid, Siegel, Stuchebrukhov, Yeh
Laboratory—two 18-hour rotations. Prerequisite: course 200 (may be taken concurrently). Two five-week laboratory assignments in the research laboratories of Biophysics Graduate Group faculty members. Individual research projects with emphasis on methodological, technical, and experimental design. May be repeated for credit two times. [I, II, III, I, II, III.]

231. Biological Nuclear Magnetic Resonance (3)
Lecture—3 hours. Prerequisite: Molecular and Cellular Biology 221A or the equivalent or consent of instructor. Principles and applications of magnetic resonance in biology and medicine. Fundamental concepts and the biophysical basis for magnetic resonance applications in areas of tissue characterization in imaging, metabolic regulation, and cellular bioenergetics. [Same course as Biological Chemistry 231.]

241. Membrane Biology (3)
Lecture—3 hours. Prerequisite: Biological Sciences 102, 103 or 104 or consent of instructor. Advanced topics on membrane biochemistry and biophysics. Relationship of the unique properties of biomembranes to their roles in cell biology and physiology. [Same course as Molecular Biology and Cellular Biology 241.]

271. Optical Methods in Biophysics (4)
Lecture—3 hours; discussion/laboratory—1 hour. Prerequisite: Biological Sciences 102 or the equivalent, Applied Science Engineering 108B or the equivalent, and Chemistry 110A or the equivalent. Principal optical techniques used to study biological structures and their related functions. Specific optical techniques useful in the studies of proteins and nucleic acids, membrane-protein and membrane-protein interactions. Biomedical applications of optical techniques. [Same course as Applied Science Engineering 271.]

290. Research Conference in Biophysics (1)
Discussion—1 hour. Prerequisite: graduate standing in Biophysics and/or consent of instructor; course 299 concurrently. Presentation and discussion of faculty and graduate-student research in biophysics. May be repeated for credit. [S/U grading only.]

290C. Research Seminar in Biophysics (1)
Seminar—1 hour. Prerequisite: graduate standing or consent of instructor. Presentation of current research by experts in biophysics. May be repeated for credit. [S/U grading only.]