SCHOOL OF MEDICINE

Dean: Philip Pizzo
Senior Associate Dean for Graduate Education and Postdoctoral Affairs: John Pringle
Senior Associate Dean for Medical Student Education: Charles Prober

The School of Medicine offers courses of study leading to the M.S., Ph.D., and M.D. degrees.

UNDERGRADUATE PROGRAMS IN THE SCHOOL OF MEDICINE

At the undergraduate level, a number of the school's courses are open to any registered Stanford student who has fulfilled the prerequisites, subject to the usual limits of course enrollment and faculty approval. In the classroom, the school offers courses targeted to undergraduates as well as graduate-level courses where advanced undergraduates with a strong background in the life sciences are welcome. Among these offerings are Stanford Introductory Seminars for freshmen and sophomores; interested students are encouraged to peruse the complete list of these offerings in the "Stanford Introductory Studies" section of this bulletin or at http://ual.stanford.edu/OO/intro_seminars/ IntroSemsOverview.

M.S. AND PH.D. PROGRAMS IN THE SCHOOL OF MEDICINE

The School of Medicine is home to graduate programs covering a broad range of disciplines within biomedicine leading to Ph.D. or M.S. degrees. These programs focus on interdisciplinary training with in-depth investigation of an original problem of fundamental importance to the biosciences. Each degree program sets its own curriculum, but many courses are taught by groups of faculty from multiple programs and departments. Flexibility is a priority to ensure that all students obtain the best possible training for pursuing careers in their areas of interest. The school is dedicated to training students from diverse backgrounds, and to the promotion of diversity in graduate education. Admission is through one of about 15 home programs. These home programs enable students to carry out dissertation research and training with School of Medicine faculty, as well as investigators in the departments of Biology and Biophysics in the School of Humanities and Sciences. Detailed information on School of Medicine M.S. and Ph.D. programs, curricula, and research can be found at http://med.stanford.edu/ms and http://med.stanford.edu/phd. Application information can be found at http://gradadmissions.stanford.edu.

M.D. PROGRAM IN THE SCHOOL OF MEDICINE

The School of Medicine seeks to attract students who are passionate about scholarship and wish to improve the health of the world's people through research, innovation, and leadership. The Stanford M.D. curriculum provides education in biomedical and clinical sciences along with study and independent research through scholarly concentrations. Emphasis is placed on interdisciplinary learning, with streamlined content and melding of basic science and clinical instruction across the curriculum. Blocks of unscheduled time allow for individual or group study, participation in elective courses, research, and reflection. Alternative pathways through the curriculum include an option of a fifth or sixth year of study as well as opportunities for pursuing a second degree, such as an M.P.H. or Ph.D.

Broad clinical science education occurs throughout the curriculum with exposure to patient care and the practice of medicine beginning on the first day of medical school. Students may begin clinical clerkships as early as May of the second year. A population health course combines classroom and experiential learning to provide understanding of the socioeconomic determinants of the health of patients and communities.

Scholarly concentrations offer opportunities for developing skills that enhance basic science and clinical training in areas such as bioengineering, biomedical ethics and medical humanities, biomedical informatics, clinical research, community health, health services and policy research, and the molecular basis of medicine. Through the scholarly concentration program, these skills may be applied in clinical areas housed within centers at Stanford such as the Comprehensive Cancer Center, the Cardiovascular Institute, the Neuroscience Institute, the Institute of Immunity, Transplantation, and Infection, and Women's Health at Stanford. Study in a scholarly concentration typically includes course work and research activities. Research for scholarly concentrations can be supported through the Medical Scholars program, which funds student research projects at Stanford and overseas.

Students with interests in medical research as a career are encouraged to investigate opportunities available through the Medical Scientist Training Program (MSTP). Stanford also collaborates with the University of California, Berkeley, to offer students opportunities for M.D./M.P.H. training. Details about these programs may be found at http://med.stanford.edu/combined_degree.

Stanford is committed to representing the diversity of the U.S. and California populations by seeking a diverse body of students who are interested in the intellectual substance of medicine and committed to advancing the field of health care, broadly defined. Provided an applicant to the school has completed basic courses in physics, chemistry, and biology, the choice of an undergraduate major may reflect other interests, including the arts and humanities. Course work in advanced biology such as biochemistry, molecular biology, or genetics and the behavioral sciences is recommended because of their importance in understanding health care. Breadth of interests and depth of experiences play an important role in the selection of students from among those applicants having superior academic records.

The M.D. degree requires 13 quarters of registration at full Med-MD tuition; the joint M.D./Ph.D. degree requires 16 quarters. All additional quarters are charged at the reduced Terminal Medical Registration (TMR) tuition rate, which is $2,251 per quarter in 2009-10. Completion of the M.D. degree must be achieved within six years, unless a petition is granted to extend this time frame. For further details on the M.D. degree, including admission requirements, see http://med.stanford.edu/md.

MULTIPLE-DEGREE PROGRAMS IN THE SCHOOL OF MEDICINE

MEDICAL SCIENTIST TRAINING PROGRAM

The Medical Science Training Program (MSTP) provides medical students with an opportunity to pursue an individualized program of research and course work leading to both the M.D. and Ph.D. degrees. It is designed to equip students for careers in academic investigative medicine, and emphasizes individualization of curricular and research programs for each trainee. Training for a combined M.D./Ph.D. should include the same content encountered by students who pursue each degree separately, but the total training time should be less than the sum of the time normally required for each degree. The flexible curriculum at Stanford's School of Medicine allows each student, in consultation with a preceptor and other advisers, to pursue a plan of study that satisfies the requirements for the M.D. degree and allows performance of doctoral-level research leading to the Ph.D. Students interested in joining the MSTP are considered for admission at the time of their application to the School of Medicine M.D. program and are asked to provide supplemental information relevant to their research background. Current Stanford M.D. students may also apply for admission to the MSTP. Further information regarding admission may be obtained from the MSTP administrator; details about the MSTP may be found at http://mstp.stanford.edu.

MASTER OF SCIENCE IN MEDICINE PROGRAM

The Master of Science in Medicine program admits Ph.D. students who have a commitment to translational research, but are not interested in becoming clinicians. The goal of the program is to train researchers in human biology and disease so they are better equipped to translate new scientific discoveries into useful medical advances. Students offered admission into any Ph.D. program at Stanford may apply for admission to the master's program. During their first five quarters, students take basic biomedical science courses with Stanford M.D. students. The School of Medicine M.D. curriculum is presented in a succinct format that allows time for students to concurrently complete their Ph.D. course requirements and lab rotations. By early in their second year, students choose a lab for their Ph.D. thesis research and complete their medical course work. They also elect a clinical mentor to discuss translational research needs and help to arrange a short clinical experience. Upon completion of the Ph.D., participating students receive an M.S. in Medicine. Details about the program can be found at http://msm.stanford.edu.

MEDICINE (MED)

UNDERGRADUATE COURSES IN MEDICINE

MED 1A. Leadership in Multicultural Health
Year-long course. Models of instruction for undergraduates serving as Stanford Medical Youth Science Summer Residential Program (SMYSP) staff. Observation, participation, and evaluation of leadership development and multicultural health theories and practices; school and community engagement and advocacy. 1 unit: class attendance and oral presentation; 2 units: class attendance and project portfolio; 3 units: class attendance, poster and oral presentation; 4 units: class attendance and reflective term paper. Applications for this year-long course must be submitted during autumn quarter. Contact Judith Ned: jned@stanford.edu, 650-498-4514. Current or past SMYSP Summer Residential Program staff.
1-4 units, Win (Winkleby, M; Ned, J)

MED 1B. Leadership in Multicultural Health
Models of instruction for undergraduates serving as Stanford Medical Youth Science Summer Residential Program (SMYSP) staff. Application of leadership development skills, multicultural health theories and practices, and school and community engagement and advocacy to creating and implementing activities for low-income high school students participating in the Summer Residential Program. 1 unit: class attendance and oral presentation; 2 units: class attendance and project portfolio; 3 units: class attendance, poster and oral presentation; 4 units: class attendance and reflective term paper. Prerequisite: MED 1A.
1-4 units, Spr (Winkleby, M; Ned, J)

MED 1C. Leadership in Multicultural Health
Students submit a written reflective term paper based on their experience as staff for the SMYSP Summer Residential Program. Prerequisite: MED 1A/B.
1 unit, Aut (Winkleby, M; Ned, J)

MED 70Q. Cancer and the Immune System
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. Myths and facts surrounding the idea that the immune system is capable of recognizing malignant cells. The biological basis and function of effector arms of the immune system; how these mechanisms may be used to investigate the biological basis and potential therapy of cancer. How the immune system functions.
3 units, Spr (Negrin, R)

MED 83Q. Ethical, Legal, and Social Dimensions of Stem Cell Research
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. Ethical, legal, social, and economic dimensions of stem cell research such as the discovery of human embryonic stem cells and the international landscape of public policy. How stem cells work, their role in the upkeep of the human body, and current and future uses in medicine. Issues at the intersection of science and society such as human-animal hybrids, notions of justice in intellectual property law, distribution of health care, and the major ethical frameworks defining the debate.
3 units, Spr (Scott, C)

MED 86Q. Seeing the Heart
(F,Dial) Stanford Introductory Dialogue. Introduction to biomedical technology, science, clinical medicine, and public policy through cardiovascular imaging. Invasive and noninvasive techniques to detect early stage heart disease and to see inside the heart and blood vessels. Topics include: common forms of heart disease, how they develop, and why they affect so many people; imaging technologies such as ultrasound, CT, MRI, PET, and optical; a cost-effective public screening program. Field trips to Stanford Medical Center imaging centers.
2 units, Win (McConnell, M)

MED 87Q. Women and Aging
(S,Sem) (Same as HUMBIO 87Q) Stanford Introductory Seminar. Preference to sophomores. Biology, clinical issues, social and health policies of aging; relationships, lifestyles, and sexuality; wise women and grandmothers. Sources include scientific articles, essays, poetry, art, and film. Service-learning experience with older women. GER:EC-Gender
5 units, Win (Winograd, C)

MED 88Q. Dilemmas in Current Medical Practice
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. Social, political, scientific, and economic forces influencing medical practice. Spiraling costs, impaired access to health care, and disillusionment toward the health care system. Attempts by government and medical insurers to control costs through managed care and health maintenance organizations. Medical education and how it has affected the practice of medicine. Alternative health care, preventive medicine, and the doctor-patient relationship. The paradox of health in America: why do so many people who are healthy feel unhealthy? Mandatory observation of instructors in their medical practices.
3 units, Aut (Croke, J; Jones, H)

MED 93Q. The AIDS Epidemic: Biology, Behavior, and Global Responses
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. How the discovery of the causative agent and the modes of transmission of HIV fueled a quest for prevention, treatments, and a vaccine. Discoveries in biology, biotechnology, epidemiology, and medicine during the last 20 years. Hypotheses about the origins of HIV as a human disease; the spread of AIDS and HIV; social, political, and economic consequences of the epidemic; and national and global responses.
3 units, Aut (Katzenstein, D)

MED 108Q. Human Rights and Health
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. History of human-rights law. International conventions and treaties on human rights as background for social and political changes that could improve the health of groups and individuals. Topics such as: regional conflict and health, the health status of refugees and internally displaced persons; child labor; trafficking in women and children; HIV/AIDS; torture; poverty, the environment and health; access to clean water; domestic violence and sexual assault; and international availability of drugs. Possible optional opportunities to observe at community sites where human rights and health are issues. Guest speakers from national and international NGOs including Doctors Without Borders; McMaster University Institute for Peace Studies; UC Berkeley Human Rights Center; Kiva. Powerpoint presentation on topic of choice required.
3 units, Win (Laws, A)

MED 143. Patient Health Education in Community Clinics
(Same as MED 243) (Open to undergraduate, graduate, and medical students) Principles of health education, theories of behavior change, methods for risk reduction. Presentations of health education modules, focusing on topics prevalent among underserved populations. Students apply theoretical frameworks to health education activities in the Cardinal Free Clinics.
2 units, Aut (Kao, P; Ho, E)

MED 147. Methods in Community Assessment, Evaluation, and Research
(Same as MED 247) Development of pragmatic skills for design, implementation, and analysis of structured interviews, focus groups, survey questionnaires, and field observations. Topics include: principles of community-based participatory research, including importance of dissemination; strengths and limitations of different study designs; validity and reliability; construction of interview and focus group questions; techniques for moderating focus groups; content analysis of qualitative data; survey questionnaire design; and interpretation of commonly-used statistical analyses.
3 units, Spr (Kiernan, M; Fortmann, S)

MED 149. Medical Interpreting: Skills and Etiquette
(Same as MED 249) Open to medical students, graduate and undergraduate students. The skills and etiquette of medical interpreting from a cross-cultural perspective. Includes an overview of the U.S. healthcare system and guest lectures on humanistic medicine. Requires two volunteer shifts at the Arbor Free Clinic. Successful completion qualifies students to become volunteer interpreters at the Stanford University Medical Center and the Arbor Free Clinic. Prerequisite: Fluency in a language other than English.
2 units, Win (Osterberg, L; Chen, Y)

MED 160. Physician Shadowing: Stanford Immersion in Medicine Series (SIMS)
Undergraduates are paired with a physician mentor at Stanford Hospital and Clinics, Lucile Packard Children's Hospital, or the Veteran's Administration Hospital. May be repeated for credit. Prerequisite: Application and acceptance to the SIMS program.
1 unit, Aut (Gesundheit, N; Fox, E), Win (Gesundheit, N; Fox, E), Spr (Gesundheit, N; Lewis, P)

MED 199. Undergraduate Research
Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.
1-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

GRADUATE COURSES IN MEDICINE

MED 201. Introduction to Internal Medicine
Introduction to the different roles internists play in health care. Weekly lectures augmented with opportunities for monitorship, shadowing, and clinical skills-building. Lecture topics include primary care, subspecialties, and non-clinical careers.
1 unit, Aut (Verghese, A)

MED 207. History of Medicine
Weekly lectures that trace the development of Western medical tradition from Babylonian, Egyptian, and Greek ancient cultures to the present.
1 unit, Win (Camargo, C)

MED 217. Technological Frontiers in Digestive Diseases
Focused on introducing engineering, bioengineering, and physical sciences students to technologies used in the clinical setting. Topics include: endoscopes to detect and remove cancer; minimally invasive surgery to treat obesity; measurements of propulsion through the intestine; and technologies to detect and stop internal bleeding. Observations in the clinical setting; visits to laboratories engaged in the development of new technologies.
2 units, Spr (Lowe, A; Milroy, J)

MED 227. Bedside Ultrasound
For pre-clinical or clinical medical students, and others with permission. Uses of ultrasound (US) at the bedside. Portable US machines (now the size of laptop computers) are used. How to identify the normal anatomy of the heart, abdomen, and pelvis using US. As proficiency increases, patients with abnormal physical findings are examined at the bedside, enabling students to compare the traditional physical examination with information obtained during US. The syllabus, Introduction to the Physical Examination with Diagnostic Ultrasound (2001), written by Drs. Wolfe and Thompson is used as the students' guide.
1 unit, Aut (Liang, D; Thompson, N), Win (Liang, D; Thompson, N), Spr (Liang, D; Thompson, N)

MED 228. Physicians and Social Responsibility
Social and political context of the roles of physicians and health professionals in social change; policy, advocacy, and shaping public attitudes. How physicians have influenced governmental policy on nuclear arms proliferation; environmental health concerns; physicians in government; activism through research; the effects of poverty on health; homelessness; and gun violence. Guest speakers from national and international NGOs.
1 unit, Aut (Laws, A)

MED 230. Rethinking International Health
Issues and players that shape international health today. How to develop a road map for thoughtful, responsible action. Topics include: the role of the physician and health care worker; health as a human right; successful interventions; children's and women's health; issues in immunization; economic development; and NGOs. Online interviews with influential leaders in international health.
2-3 units, Spr (Goldhaber-Fiebert, J)

MED 236. Psychosocial and Behavioral Health Interventions
For medical students, graduate students and undergraduates with senior standing in Human Biology or Psychology. Contemporary theory and conceptual frameworks for psychosocial and behavioral change interventions as applied in the context of contemporary models of community medicine. The trans-theoretical model of behavioral change, contemporary behavioral, cognitive behavioral, social cognitive and acceptance-based models of behavioral change. Current models of emotion regulation, goal setting and attainment, and the impact of personality and characterological features on behavior and behavioral change. Application of theory in practicum based community clinic settings. Prerequisite: Stanford HIPAA training.
1 unit, not given this year

MED 240. Sex Differences in Human Physiology and Disease
(Same as OBGYN 240, HUMBIO 140) Chromosomal and hormonal influences on cells, tissues, and organs that underlie the development of reproductive organs and sexual dimorphism of the neuroendocrine system. Consequences of sex hormones and environmental factors that differ between men and women in systems including the musculoskeletal, neurological, cardiovascular, and immunological. Guest lecturers. Prerequisite: Human Biology core or equivalent, or consent of instructor.
2-3 units, Win (Stefanick, M)

MED 242. Physicians and Human Rights
Weekly lectures on how human rights violations affect health. Topics include: regional conflict and health, the health status of refugees and internally displaced persons; child labor; trafficking in women and children; HIV/AIDS; torture; poverty, the environment and health; access to clean water; domestic violence and sexual assault; and international availability of drugs. Guest speakers from national and international NGOs including Doctors Without Borders; McMaster University Institute for Peace Studies; UC Berkeley Human Rights Center; Kiva.
1 unit, Win (Laws, A)

MED 243. Patient Health Education in Community Clinics
(Same as MED 143) (Open to undergraduate, graduate, and medical students) Principles of health education, theories of behavior change, methods for risk reduction. Presentations of health education modules, focusing on topics prevalent among underserved populations. Students apply theoretical frameworks to health education activities in the Cardinal Free Clinics.
2 units, Aut (Kao, P; Ho, E)

MED 244. Health Screening in the Community
Practicum in the basics of health care screening and counseling with minor lecture component. Includes, but is not limited to, blood pressure, diabetes, cholesterol, obesity, safe sex, tuberculosis, diet and smoking. Students organize and participate in one community health screening even each month during the quarter. Adjunct to Stanford free clinics courses (Arbor and Pacific), but with consent of instructor may be taken by students not volunteering at these clinics.
1 unit, Aut (Osterberg, L), Win (Osterberg, L), Spr (Staff), Sum (Osterberg, L)

MED 247. Methods in Community Assessment, Evaluation, and Research
(Same as MED 147) Development of pragmatic skills for design, implementation, and analysis of structured interviews, focus groups, survey questionnaires, and field observations. Topics include: principles of community-based participatory research, including importance of dissemination; strengths and limitations of different study designs; validity and reliability; construction of interview and focus group questions; techniques for moderating focus groups; content analysis of qualitative data; survey questionnaire design; and interpretation of commonly-used statistical analyses.
3 units, Spr (Kiernan, M; Fortmann, S)

MED 248. Student Rounds
Teams of preclinical students meet weekly with a clinical student to hear the history and physical of a recent case the clinical student encountered on the wards. Following the presentation, the preclinical students work together under the guidance of the clinical student to develop a problem list and plan, which are then compared with the problem list, plan, and orders made by the actual admitting team. In the course of presenting the cases, the clinical student describes personal experiences and practical components of ward work and daily clinical routine.
1 unit, Aut (Kenny, K), Win (Kenny, K), Spr (Kenny, K), Sum (Kenny, K)

MED 249. Medical Interpreting: Skills and Etiquette
(Same as MED 149) Open to medical students, graduate and undergraduate students. The skills and etiquette of medical interpreting from a cross-cultural perspective. Includes an overview of the U.S. healthcare system and guest lectures on humanistic medicine. Requires two volunteer shifts at the Arbor Free Clinic. Successful completion qualifies students to become volunteer interpreters at the Stanford University Medical Center and the Arbor Free Clinic. Prerequisite: Fluency in a language other than English.
2 units, Win (Osterberg, L; Chen, Y)

MED 250A. Medical Ethics I
Required for Scholarly Concentration in Biomedical Ethics and Medical Humanities. The field of bioethics, including theoretical approaches to bioethical problems. Contemporary controversies and clinical cases. Values that arise in different situations and clinical encounters. Issues include: genetics and stem cell research, rationing, ethical issues in care at the end of life, organ transplantation issues.
2 units, Win (Magnus, D)

MED 250B. Medical Ethics II
The integration of ethical theory with applications of theory or conceptual issues in medicine, health care, and the life and social sciences. Topic varies by year. Possible topics include: ethical issues in stem cell research; death and dying; genetics and ethics; concepts of health and disease; the ethics of international research; and ethical implications of new reproductive technology.
2 units, not given this year

MED 255. The Responsible Conduct of Research
Forum. How to identify and approach ethical dilemmas that commonly arise in biomedical research. Issues in the practice of research such as in publication and interpretation of data, and issues raised by academic/industry ties. Contemporary debates at the interface of biomedical science and society regarding research on stem cells, bioweapons, genetic testing, human subjects, and vertebrate animals. Completion fulfills NIH/ADAMHA requirement for instruction in the ethical conduct of research. Recommended: research experience.
1 unit, Aut (Karkazis, K), Win (Karkazis, K), Spr (Karkazis, K)

MED 255C. The Responsible Conduct of Research for Clinical Researchers
Engages clinical researchers in discussions about ethical issues commonly encountered during their clinical research careers and addresses contemporary debates at the interface of biomedical science and society. Medical and graduate students required to take RCR who are or will be conducting clinical research are encouraged to enroll in this version of the course. Prequisites: research experience recommended, instructor consent required.
1 unit, Aut (Karkazis, K)

MED 256. Global HIV/AIDS
(Same as HUMBIO 156) Public health, policy, and research issues. Resources at Stanford and institutions such as government, NGOs, and pharmaceutical, advocacy, and international organizations. Sources include biomedical, social, and behavioral sciences. Student projects. Guest lectures. Prerequisite: Human Biology core or equivalent, or consent of instructor.
3 units, Spr (Katzenstein, D)

MED 257A. Patient Advocacy in Community Clinics
Early clinical experience for pre-medical and medical students. Structured training and shadowing in preparation for a clinical role working with patients in community health clinics; the context of the work, populations served, and social role of physicians. Regular shifts at one of the course-affiliated clinic sites throughout the academic year. 1-2 units for students attending class meetings and performing clinic shifts. 3-4 units for a year-long, clinic-based project. Prerequisite: application.
1-4 units, Aut (Garcia, G; Banchoff, A)

MED 257B. Patient Advocacy in Community Clinics
Early clinical experience for pre-medical and medical students. Structured training and shadowing in preparation for a clinical role working with patients in community health clinics; the context of the work, populations served, and social role of physicians. Regular shifts at one of the course-affiliated clinic sites throughout the academic year. 1-2 units for students attending class meetings and performing clinic shifts. 3-4 units for a year-long, clinic-based project. Prerequisite: MED 257A
1-4 units, Win (Garcia, G; Banchoff, A)

MED 257C. Patient Advocacy in Community Clinics
Early clinical experience for pre-medical and medical students. Structured training and shadowing in preparation for a clinical role working with patients in community health clinics; the context of the work, populations served, and social role of physicians. Regular shifts at one of the course-affiliated clinic sites throughout the academic year. 1-2 units for students attending class meetings and performing clinic shifts. 3-4 units for a year-long, clinic-based project. Prerequisite: 257A,B
1-4 units, Spr (Garcia, G; Banchoff, A)

MED 258. Advanced Patient Advocacy in Community Clinics
Continuation of 257A,B,C for second-year students in Patient Advocacy Program; open to students who have worked in a clinical capacity in a community clinic setting. Skills training in areas such as health education counseling and group facilitation. Regular shifts at partner clinics. Students partner with clinic staff in developing and carrying out a service-learning or research project designed to meet the clinic's needs. May be repeated for credit. Prerequisites: 257A,B,C or consent of instructor.
1-3 units, alternate years, not given this year

MED 258A. Advanced Patient Advocacy in Community Clinics
Continuation of 257A,B,C for second-year students in Patient Advocacy Program; open to students who have worked in a clinical capacity in a community clinic setting. Skills training in areas such as health education counseling and group facilitation. Regular shifts at partner clinics. Students partner with clinic staff in developing and carrying out a service-learning or research project designed to meet the clinic's needs. Prerequisites: 257A,B,C or consent of instructor.
1-3 units, Aut (Garcia, G; Banchoff, A)

MED 258B. Advanced Patient Advocacy in Community Clinics
Continuation of 258A for second-year students in Patient Advocacy Program; open to students who have worked in a clinical capacity in a community clinic setting. Skills training in areas such as health education counseling and group facilitation. Regular shifts at partner clinics. Students partner with clinic staff in developing and carrying out a service-learning or research project designed to meet the clinic's needs. Prerequisites: 257A,B,C and 258A, or consent of instructor.
1-3 units, Win (Garcia, G; Banchoff, A)

MED 258C. Advanced Patient Advocacy in Community Clinics
Continuation of 258A/B for second-year students in Patient Advocacy Program; open to students who have worked in a clinical capacity in a community clinic setting. Skills training in areas such as health education counseling and group facilitation. Regular shifts at partner clinics. Students partner with clinic staff in developing and carrying out a service-learning or research project designed to meet the clinic's needs. Prerequisites: 257A,B,C and 258 A, B, or consent of instructor.

1-3 units, Spr (Garcia, G; Banchoff, A)

MED 259. Oaxacan Health on Both Sides of the Border
Required for students participating in the Community Health in Oaxaca summer program. Introduction to the health literacy and health-seeking behaviors of Oaxacan and other Mexican migrants; examines the health challenges these groups face. Through discussion and reflection, students prepare for clinical work and community engagement in Oaxaca, while also gaining knowledge and insight to make connections between their experiences in Mexico and their health-related work with Mexican immigrants in the Bay Area. Prerequisite: application and acceptance into the Community Health in Oaxaca Summer Program (http://och.stanford.edu/oaxaca.html).

2 units, Spr (Garcia, G; Banchoff, A)

MED 262. Economics of Health Improvement in Developing Countries
(Same as ECON 127) Application of economic paradigms and empirical methods to health improvement in developing countries. Emphasis is on unifying analytic frameworks and evaluation of empirical evidence. How economic views differ from public health, medicine, and epidemiology; analytic paradigms for health and population change; the demand for health; the role of health in international development. Prerequisites: ECON 50 and 102B, and consent of instructor.

5 units, not given this year

MED 272A. Biodesign Innovation Core: Needs Finding and Concept Creation
(Same as BIOE 374A, ME 368A) Two quarter sequence. Inventing new medical devices and instrumentation, including: methods of validating medical needs; techniques for analyzing intellectual property; basics of regulatory (FDA) and reimbursement planning; brainstorming and early prototyping. Guest lecturers and practical demonstrations. May be taken alone (2 units) or in combination with the project component (4 units).

2-4 units, Win (Yock, P; Zenios, S; Milroy, J; Brinton, T)

MED 272B. Biodesign Innovation Core: Concept Development and Implementation
(Same as BIOE 374B, ME 368B) Two quarter sequence. How to take a medical device invention forward from early concept to technology translation and development. Topics include prototyping; patent strategies; advanced planning for reimbursement and FDA approval; choosing translation route (licensing versus start-up); ethical issues including conflict of interest; fundraising approaches and cash requirements; essentials of writing a business or research plan; strategies for assembling a development team. May be taken alone (2 units) or in combination with the project component (4 units). Prerequisite: MED 272A, ME368A, or BIOE 374A.

2-4 units, Spr (Staff)

MED 275. Introduction Biopharmaceutical Innovation
Open to all students. Biotechnology and the pharmaceutical industry. Topics include the biopharmaceutical industry, historical trends, and experiences; research and development; intellectual property; drug approval: regulatory issues and agencies; business development; marketing; manufacturing; capital structure and financing; careers in biopharmaceutical industry. 2-unit option, lectures and weekly assignments, MED or S/NC grading only. 3-unit option, including a group project and final presentation, may be taken for a letter grade. May be repeated for credit.

2-3 units, Win (Gardner, P; Seam, A)

MED 276. Careers in Medical Technology
Career tracks in biomedical technology for medical, life science, engineering, business, and law students of all levels. Industry professionals describe career tracks, current roles, and industry perspectives. 2-unit option, lectures and weekly assignments, MED or S/NC grading only. 3-unit option, including a group project and final presentation, may be taken for a letter grade. May be repeated for credit.

2-3 units, Spr (Gardner, P; Seam, A)

MED 282. Early Clinical Experience at the Arbor Free Clinic
Students provide health care in a student-run clinic for the homeless and uninsured. Student volunteers are guided in the practice of medical interviews, history-taking and physical examinations as appropriate. Clinical students and attending physicians provide support and guidance as the team arrives at a diagnosis and management plan. Two units of credit is intended for Steering Committee members or for students who work at the clinic every other Sunday.

1-2 units, Aut (Osterberg, L), Win (Osterberg, L), Spr (Osterberg, L), Sum (Osterberg, L)

MED 283. Early Clinical Experience at Pacific Free Clinic
Hands-on experience at a student-run free clinic targeting immigrants in the San Jose area. Opportunity to work with an interpreter and learn about unique health care issues faced by immigrants. Students are expected to conduct history and physicals, present to the attending physician, help arrive at a diagnosis and plan and participate in basic procedures. 1 unit for limited commitment. 2 units for volunteers in training and students who volunteer a minimum of once a month. 3 units for Steering Committee members and students who volunteer a minimum of twice a month.

1-3 units, Aut (Staff), Win (Kao, P; Martin, M), Spr (Kao, P)

MED 289. Introduction to Bioengineering Research
(Same as BIOE 390) Preference to medical and bioengineering graduate students. Bioengineering is an interdisciplinary field that leverages the disciplines of biology, medicine, and engineering to understand living systems, and engineer biological systems and improve engineering designs and human and environmental health. Topics include: imaging; molecular, cell, and tissue engineering; biomechanics; biomedical computation; biochemical engineering; biosensors; and medical devices. Limited enrollment.

1-2 units, Aut (Taylor, C), Win (Taylor, C)

MED 295. Advanced Cardiac Life Support
(For clinical MD students only) Prepares students to manage the victim of a cardiac arrest. Knowledge and skills necessary for resuscitation of critically-ill patients. Clinical scenarios and small group discussions address cardiovascular pharmacology, arrhythmia recognition and therapy, acute coronary syndrome including myocardial infarction, ventricular dysrhythmias and defibrillation, and acute ischemic stroke. Requires pre-course preparation and an intensive two-day session on a Friday and Saturday. Students should get the approval of their Clerkship Coordinator before registering for the course. Recommended prerequisites: Medicine 300A, Pediatrics 300A, or Surgery 300A.

2 units, Aut (Giacomini, J), Win (Giacomini, J), Spr (Giacomini)

MED 299. Directed Reading in Medicine
Prerequisite: consent of instructor.

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

MED 370. Medical Scholars Research
Provides an opportunity for student and faculty interaction, as well as academic credit and financial support, to medical students who undertake original research. Enrollment is limited to students with approved projects.

4-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

MED 399. Graduate Research
Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

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

MEDICINE INTERDISCIPLINARY (INDE)

UNDERGRADUATE COURSES IN MEDICINE INTERDISCIPLINARY

INDE 183I. Early Clinical Experience in International Family and Community Medicine
(Same as INDE 283I) (Graduate students register for 283I.) For preclinical medical students; undergraduates by special arrangement. Interactive early clinical experience with physicians, community leaders, health care workers, and patients in Mexico, India, China, or Tibet. Emphasis is on community health from local and global perspectives. Social, political, historical, and economic backgrounds of the country and local region. Non-western attitudes, beliefs and practices regarding health care, including herbal and other complementary medicine; local institutions and infrastructure including schools, social services, and the public health care system; and policies that impact health and the provision of care. Prerequisites: conversational Spanish for Mexico; for medical students, completion of first year; for undergraduates, junior standing or higher. Undergraduates apply through International Alliance in Service and Education (IASE) for Mexico; Volunteers in Asia (VIA) for Asian sites. Medical students a

6-12 units, Aut (LeBaron, S), Win (LeBaron, S), Spr (LeBaron, S), Sum (LeBaron, S)

INDE 199. Undergraduate Directed Reading and Research in Family and Community Medicine
Interested students should contact the Center for Education in Family and Community Medicine administration. Prerequisite: consent of instructor.

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

GRADUATE COURSES IN MEDICINE INTERDISCIPLINARY

INDE 200. The Future of Academic Medicine
Required for first-year MSTP students; limited to MSTP. Presentations of research directions and opportunities by chairs of basic science, clinical departments, and PhD programs. Prerequisite: instructor consent.

1 unit, Aut (Kim, S)

INDE 207A. Medical Mandarin I: Beginning
Develops essential medical vocabularies and conversational communication skills. Teaches the pinyin pronunciation system, which provides an accessible method of learning basic phrases. The foundations of taking a comprehensive patient history in Mandarin and doing medical interviews at individual hospital divisions, including making introductions, soliciting symptoms, explaining health concepts (e.g. diseases and prescriptions). Main goals are to improve rapport with Chinese patients through Mandarin fluency in the medical setting and to promote understanding of Chinese culture in the context of health care. Students participating in classroom instruction only register for 1 unit. Students registering for 2 units participate in field activities as well.

1-2 units, Aut (Wang, X; So, S)

INDE 207B. Medical Mandarin II: Intermediate
For students who already have a basic command of spoken Chinese. Conversational communication skills practiced in a more advanced setting, including more sophisticated assessment of patient history and cultural components that influence diseases found in Chinese-speaking patients. Builds working vocabulary for organ system disease processes to conduct a full physical exam, and to describe treatment modalities for Chinese-speaking patients (diagnostic and therapeutic). Students participating in classroom instruction only register for 1 unit. Students registering for 2 units participate in field activities as well. Prerequisite: one semester of college-level Chinese or instructor assessment of fluency.

1-2 units, Aut (Wang, X; So, S)

INDE 207C. Medical Mandarin III: Advanced
Access advanced professional medical vocabulary, conduct medical research, and engage in discussions in Chinese. Aims at a proficiency level of medical interpreting or doing other independent work in Chinese. Students are also assisted in doing a project or projects related to a specific field of medicine. Students participating in classroom instruction only register for 1 unit. Students registering for 2 units participate in project activities as well. Prerequisite: Completion of Medical Mandarin II, or advanced Chinese proficiency.

1-2 units, Aut (Wang, X; So, S)

INDE 208C. Medical Mandarin III: Advanced
Access advanced professional medical vocabulary, conduct medical research, and engage in discussions in Chinese. Aims at a proficiency level of medical interpreting or doing other independent work in Chinese. Students are also assisted in doing a project or projects related to a specific field of medicine. Students participating in classroom instruction only register for 1 unit. Students registering for 2 units participate in project activities as well. Prerequisite: Completion of 207C, or advanced Chinese proficiency.

1-2 units, Win (Wang, X; So, S)

INDE 209C. Medical Mandarin III: Advanced
Access advanced professional medical vocabulary, conduct medical research, and engage in discussions in Chinese. Aims at a proficiency level of medical interpreting or doing other independent work in Chinese. Students are also assisted in doing a project or projects related to a specific field of medicine. Students participating in classroom instruction only register for 1 unit. Students registering for 2 units participate in project activities as well. Prerequisite: Completion of 208C or advanced Chinese proficiency.

1-2 units, Spr (Wang, X; So, S)

INDE 210. The Healer's Art
For pre-clinical and clinical medical students. Explores core dimensions of meaning, service and healing exemplified by the outstanding physician. Goals are to develop and preserve personal values such as service, harmlessness, compassion, altruism, self care, integrity, equality, justice, respect, and nurturing wholeness; to develop the compassionate listening skill that is foundational for clinical practice and for finding personal meaning and satisfaction; and to clarify a commitment to medicine as one's life's work. Clinical faculty facilitate small group sessions and participate in the discovery model process on an equal footing with students. The Healer's Art was originally developed by Dr. Rachel Naomi Remen, Clinical Professor at UCSF.

1 unit, Aut (Feldstein, B; LeBaron, S)

INDE 211. Creative Writing
For medical students - all levels of writing skill. Examines uses of creative writing, including understanding the experience of medical training.

1 unit, Win (Charlton, B; Shafer, A)

INDE 212. The Human Condition: Medicine, Arts, and Humanities
The interdisciplinary field of medical humanities: the use of the arts and humanities to examine medicine in personal, social, and cultural contexts. Topics include the doctor/patient relationship, the patient perspective, the meaning of doctoring, and the meaning of illness. Sources include visual and performing arts, film, and literary genres such as poetry, fiction, and scholarly writing. Designed for medical students in the Biomedical Ethics and Medical Humanities Scholarly Concentration, but all students are welcome.

2 units, Spr (Zaroff, L; Shafer, A)

INDE 213. Medical Tai Chi
Tai chi as a recognized form of complimentary and alternative medicine. Intended to promote student health and well-being and to decrease stress, depression, and anxiety through the practice of tai chi. Weekly practices under the instruction of world-renowned 20th generation tai chi expert, Master Shu Dong Li. Analysis of the literature regarding health benefits of tai chi.

2 units, Aut (Sundberg, M; LeBaron, S), Win (Andrews, J; LeBaron, S), Spr (Andrews, J; LeBaron, S)

INDE 214. Stanford Medical Student Clinical Journal
Provides an opportunity for editors of all levels to cultivate their skills and assist in preparing pieces submitted by colleagues for publication in the Stanford Medical Student Clinical Journal (SMSCJ). Students enrolled in the course work closely with student authors as well as other editors. Editors examine multiple categories of writing, including opinion pieces, poetry, memoirs, book reviews, case reports and investigative reports. The SMSCJ is published two to three times per year and highlights the diverse talents of Stanford medical students in both scientific writing and the humanities.

1 unit, Aut (Shafer, A; Connolly, A), Win (Shafer, A; Cross, P), Spr (Shafer, A; Cross, P)

INDE 216. Cells to Tissues
Focuses on the cell biology and structural organization of human tissues as self-renewing systems. Topics include identification and differentiation of stem cells, regulation of the cell cycle and apoptosis in normal and cancerous cells, cell adhesion and polarity in epithelial tissues, intracellular transport, and cell migration. Histology laboratory sessions examine normal and abnormal samples of blood, epithelia, skin, connective tissue, muscle, bone and cartilage. Patient presentations and small group discussions of current medical literature illustrate how cell biology influences medical practice.

3 units, Aut (Theriot, J; Connolly, A)

INDE 219. Mind-Body Medicine
Exploration of the interconnections among human capacities such as thought, emotion, belief, attitudes, and physical health. Reviews literature relevant to mind-body medicine. Discusses and practices specific skills (including mindfulness exercises, meditation, imagery, visualization, body awareness, autogenics, and biofeedback) to enhance self-awareness, self-expression, and stress management. Anticipated benefits to class participants include discovering and mobilizing their capacity to participate in valuable and proven methods of stress reduction, while dealing with the frustrations and alienation that many students experience in medical school and beyond. Prerequisite: Interest in PsychoNeuroimmunology.

1 unit, not given this year

INDE 220. Human Health and Disease I
Establishes the foundation for the Human Health and Disease block which spans Q3 (Spring quarter Year One) through Q5 (Winter quarter Year Two). The Human Health and Disease block presents organ system-based histology, pathology, physiology, pharmacology, and infectious disease in a sequence of interdisciplinary courses. Each organ-specific integrated course includes a review of the anatomy and related histology, normal function of that organ system, how the organ system is affected by and responds to disease including infection, and how diseases of that organ system are treated (therapeutics).

3 units, Win (Siegel, R; Whitlock, J; Regula, D)

INDE 221. Human Health and Disease II
Structure, function, disease, and therapeutics of the respiratory system and the cardiovascular system. See INDE 220 for a description of the Human Health and Disease block .

12 units, Spr (Regula, D; Kobilka, B; Kao, P; Cross, P; Whitlock, J)

INDE 222. Human Health and Disease III
Structure, function, disease, and therapeutics of the renal/genitourinary system, the gastrointestinal system, the endocrine system, male and female reproductive systems, and women's health. See INDE 220 for a description of the Human Health and Disease block .

15 units, Aut (Regula, D; Meyer, T; Lowe, A; Gesundheit, N; Hillard, P; Connolly, A; Siegel, R)

INDE 223. Human Health and Disease IV
Structure, function, disease, and therapeutics of the central nervous system, hematologic system and multi-systemic diseases. See INDE 220 for a description of the Human Health and Disease block.

11 units, Win (Regula, D; Cross, P; Siegel, R; Glader, B; Ferrell, J; Fisher, R)

INDE 226. History of Medicine Online
Via Internet. Topics include: ancient medicine, Egypt and Babylonia, ancient Greece and Rome, Europe in the Middle Ages and the Renaissance, 18th-century schools of thought, and technological medicine. Sources include Kleinman's core clinical functions, and text, pictures, hypertext links, and sound clips. For assistance accessing the course, email: cwpsupport@lists.stanford.edu.

1 unit, Aut (Shafer, A), Win (Shafer, A), Spr (Shafer, A)

INDE 227. Careers in Medicine: Pathways in the Medical Sciences
Open to medical students, graduate and undergraduate students. Interactive, seminar-style sessions expose students to diverse career opportunities and the challenges of developing work-life balance in medicine. Recognized experts in clinical medicine and biomedical research who have been innovators in their careers discuss their work, decision-points in their career pathways, and lifestyle aspects of their choices.

1 unit, Spr (Gesundheit, N)

INDE 228. Career Transition Planning: Taking Action Today for a Successful Tomorrow
Open to School of Medicine MD and graduate students; post-docs and clinical fellows may audit by consent of instructor. How to prioritize career goals and develop an effective job search campaign. Topics: translating scientific and clinical training into a variety of workplace environmennts, professional network development, professional interest assessment, recruiters' perspectives, credentials development, and creating a marketing plan. Guest speakers from myriad career fields. May be repeated for credit.

1 unit, Spr (Eberle, S)

INDE 229. Managing Difficult Conversations
(Same as GSBGEN 568) Dealing effectively with difficult interpersonal situations in medical contexts. Focus is on improving students' judgment as to how to prepare for and confront difficult discussions in medical situations. Relevant principles of professionalism, leadership, and psychology underlie the course pedagogy. Case-based; student-to-student and student-to-instructor role-playing in actual medical situations. Patient and physician-expert participation as class guests.

1 unit, Aut (Grousbeck, I; Prober, C)

INDE 231. Future Faculty Seminar
(Same as CTL 231) For graduate students from all disciplines who are considering faculty careers. Postdoctoral fellows, TGR students, and research/clinical trainees may audit by consent of instructor. Explores the broad spectrum of duties and opportunities presented through faculty positions beyond the research-related aspects. Develops awareness of resources and skills that lead to faculty success; answers field-specific and related faculty job questions through discussions with representatives of a variety of academic institutions and fellow course participants. Topics include: finding and obtaining faculty positions, negotiating and navigating the first year, and working toward tenure. May be repeated for credit.

1 unit, Aut (Eberle, S; Wright-Dunbar, R)

INDE 238. Current Concepts and Dilemmas in Genetic Testing
(Same as GENE 238) For M.D., biomedical graduate, and genetic counseling students. Issues arising from the translational process from research to commercialization. Diagnostic inventions and applications, community implications, newborn screening, cancer genetics, and pharmacogenomics. Guest experts.

2 units, Spr (Tobin, S; Schrijver, I; Cowan, T; Magnus, D)

INDE 241. Assistantship in Family and Community Medicine
Limited to MD students. In-depth experience with a family physician preceptor following the first or second year of the pre-clinical curriculum. Placements with family physicians' practices throughout California.

6-12 units, Aut (Grudzen, M; LeBaron, S), Sum (LeBaron, S; Grudzen, M)

INDE 244. Ethnicity and Medicine
Weekly lecture series introduces basic information about ethnic and cultural factors that impact patient care. Presents information about culturally sensitive health care services and addresses contemporary research issues involving minority and underserved populations. Topics include health care issues and indigenous medical practices of African Americans, Asians, Latinos, Native Amer-

icans, immigrants and refugees in both urban and rural settings. One unit for weekly lectures only; two units require additional discussions facilitated by course director; three units (non-medical graduate students and undergraduates) require weekly response papers and a research paper.

1-3 units, Spr (Garcia, R)

INDE 245. Women and Health Care
Lecture and seminar series. Topics of interest to women as health care consumers and providers. The historical role of women in health care; current and future changes.

1-2 units, Aut (Grudzen, M; LeBaron, S; Massion, C)

INDE 253. Rural Health with a Global Perspective
Health status of the population, availability of health services and institutions, personal and environmental factors affecting health and medical care, and present and future models for change. Three-day field trip to San Joaquin Valley and mountain sites.

3-5 units, not given this year

INDE 262A. Providing and Evaluating Health Education for Underserved Children
A service learning experience in community health. Students participate in developing health education materials for underserved middle school students based on principles of human biology and health science ; become knowledgeable about logic modes and other evaluation tools available for evaluating health education modules and community intervnetions; develop an implementation and evaluation plan. Prequisite for undergraduates: Human Biology core or equivalent or consent of instructor.

3 units, Win (Staff), Spr (Staff)

INDE 283I. Early Clinical Experience in International Family and Community Medicine
(Same as INDE 183I) (Graduate students register for 283I.) For preclinical medical students; undergraduates by special arrangement. Interactive early clinical experience with physicians, community leaders, health care workers, and patients in Mexico, India, China, or Tibet. Emphasis is on community health from local and global perspectives. Social, political, historical, and economic backgrounds of the country and local region. Non-western attitudes, beliefs and practices regarding health care, including herbal and other complementary medicine; local institutions and infrastructure including schools, social services, and the public health care system; and policies that impact health and the provision of care. Prerequisites: conversational Spanish for Mexico; for medical students, completion of first year; for undergraduates, junior standing or higher. Undergraduates apply through International Alliance in Service and Education (IASE) for Mexico; Volunteers in Asia (VIA) for Asian sites. Medical students a

6-12 units, Aut (LeBaron, S), Win (LeBaron, S), Spr (LeBaron, S), Sum (LeBaron, S)

NEUROSURGERY (NSUR)

UNDERGRADUATE COURSES IN NEUROSURGERY

NSUR 70Q. Experimental Stroke
(F,Dial) Stanford Introductory Dialogue. Preference to sophomores. How stroke is studied in the laboratory; advances in stroke research over the last two decades; and future directions. Topics include: cellular and molecular mechanisms of neuronal death and survival in the brain after stroke, including necrosis, apoptosis, inflammation, and cell signaling pathways; experimental tools for stroke treatment, such as gene therapy, cell therapy, hypothermia, preconditioning, postconditioning, and other pharmacological treatments; the gap and barrier between laboratory research and clinical translation.

2 units, Spr (Staff)

NSUR 199. Undergraduate Research
Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

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

GRADUATE COURSES IN NEUROSURGERY

NSUR 261. Principles and Practice of Stem Cell Engineering
(Same as BIOE 261) Quantitative models used to characterize incorporation of new cells into existing tissues emphasizing pluripotent cells such as embryonic and neural stem cells. Molecular methods to control stem cell decisions to self-renew, differentiate, die, or become quiescent. Practical, industrial, and ethical aspects of stem cell technology application. Final projects: team-reviewed grants and business proposals.

3 units, alternate years, not given this year

NSUR 278A. From Science to Business: Innovation in Neurologic Disease Beyond Neurosurgery
For medical, business, and engineering students. The process of innovation and company building in the medical field, emphasizing the neurosciences. Overview of neurological diseases; business and regulatory aspects of device and biotech product development. Guest speakers on healthcare entrepreneurship. Venture capital and entrepreneurial mentors guide interdisciplinary student teams in evaluating a solution to an unmet clinical need or a project within a biotech company. May be taken for 2 units without the team project.

2-4 units, alternate years, not given this year

NSUR 278B. Independent Study on Healthcare Innovation and Entrepreneurship
Continuation of NSUR 278A for students wishing to work on actual strategy and implementation of their idea developed in 278A or, more generally, for students who wish to develop a strategic plan for a specific healthcare (drug or device) venture.

2-4 units, Aut (Kallmeyer, V; Steinberg, G), Win (Kallmeyer, V; Steinberg, G), Spr (Staff), Sum (Kallmeyer, V)

NSUR 279. Concepts in Drug Delivery and Drug Device Combinations
Open to all graduate students. Issues relating to drug-device combination products, including review of recently approved products such as cardiac stent), and development, regulatory, and reimbursement issues. Emphasis is on market evaluation, product development, and regulatory strategies. Lecture only for 2 units; project for 4 units.

2-4 units, Win (Kallmeyer, V), alternate years, not given next year

NSUR 299. Directed Reading in Neurosurgery
Prerequisite: consent of instructor.

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

NSUR 370. Medical Scholars Research
Provides an opportunity for student and faculty interaction, as well as academic credit and financial support, to medical students who undertake original research. Enrollment is limited to students with approved projects.

4-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

ORTHOPEDIC SURGERY (ORTHO)

UNDERGRADUATE COURSES IN ORTHOPEDIC SURGERY

ORTHO 97Q. Sport, Exercise, and Health: Exploring Sports Medicine
(S,Sem) (Same as HUMBIO 97Q) Stanford Introductory Seminar. Preference to sophomores. Sports medicine is the practice of clinical medicine at the interface between health and performance, competition and well-being. While sports medicine had its origins in providing care to athletes, medical advances developed in care of athletes exerted a great effect on the nature and quality of care to the broader community. Topics include sports injuries, medical conditions associated with sport and exercise, ethics, coaching, women's issues, fitness and health, and sports science. Case studies.

3 units, Win (Matheson, G)

ORTHO 102. Orthopaedic Surgical Anatomy
(Same as ORTHO 202) Open to medical and undergraduate students. Opportunity to enhance knowledge of anatomy as it pertains to the practice of Orthopaedic Surgery and to improve dissection skills. Follows the operative anatomy syllabus used by the Stanford Orthopaedic Surgery Residency Program. Sessions led by Stanford Orthopaedic Surgery attendings and residents. Didactic sessions, prosection review, dissection.
2 units, Sum (Staff)

ORTHO 199. Undergraduate Research
Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.
1-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

GRADUATE COURSES IN ORTHOPEDIC SURGERY

ORTHO 202. Orthopaedic Surgical Anatomy
(Same as ORTHO 102) Open to medical and undergraduate students. Opportunity to enhance knowledge of anatomy as it pertains to the practice of Orthopaedic Surgery and to improve dissection skills. Follows the operative anatomy syllabus used by the Stanford Orthopaedic Surgery Residency Program. Sessions led by Stanford Orthopaedic Surgery attendings and residents. Didactic sessions, prosection review, dissection.
2 units, Sum (Staff)

ORTHO 222. Anatomy of Movement
Perspectives include orthopedic surgery, neurology, mechanical engineering, computer science, anthropology, and art. Anatomy and pathology affecting the human locomotor system. Normal function and functional deficit from disease or injury. Engineering dilemmas that assist or emulate human movement, such as design of an artificial joint or simulation of tendon transfers for nerve palsy. The expression of human movement in art masterpieces and photography. The evolution of the hand as it became an instrument of purpose. Student team projects. Lecture only for 2 units; project for 4 units.
2-4 units, Win (Ladd, A; Rose, J)

ORTHO 260. Tissue Engineering
Biological principles underlying the use of engineering strategies and biocompatible materials for tissue repair and regeneration. Structure, physiology, and mechanics of articular cartilage, bone, and dense soft connective tissues. Current ideas, approaches, and applications being implemented as therapeutic regimens for arthritis, spinal deformities, and limb salvage. Multidisciplinary constraints on the design and creation of tissue constructs. Prerequisite: familiarity with basic cell and molecular mechanisms underlying tissue differentiation.
3 units, Win (Smith, R)

ORTHO 370. Medical Scholars Research
Provides an opportunity for student and faculty interaction, as well as academic credit and financial support, to medical students who undertake original research. Enrollment is limited to students with approved projects.
4-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

SURGERY (SURG)

UNDERGRADUATE COURSES IN SURGERY

SURG 68Q. Current Concepts in Transplantation
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. Biological aspects of cell and organ transplantation, including issues that arise in the media. Diseases for which transplantation is a treatment, the state of the art in human transplantation, transplantation of animal tissue into humans (xenotransplantation), development of new tissue and organs in the laboratory (tissue engineering and cloning), and development of drugs and biological strategies to promote long-term survival of the tissue or organ (tolerance). How to write a scientific abstract, critique scientific literature, and research and present topics in contemporary transplantation.
3 units, Spr (Martinez, O; Krams, S)

SURG 69Q. It's All in the Head: Understanding Diversity, Development, and Deformities of the Face
(S,Sem) Stanford Introductory Seminar. Preference to sophomores. How the face conveys moods and emotions, and elicits reactions when disease or genetic disorders leave behind disfigurement. New work by evolutionary and molecular biologists concerning how variations in facial form are elicited; how tissues and molecules interact to form the face. How differences in facial anatomy affect an individual's self-perception and their acceptance in our beauty-conscious society.
3-4 units, Win (Helms, J; Brugmann, S)

SURG 70Q. Surgical Anatomy of the Hand: From Rodin to Reconstruction
(F,Dial) Stanford Introductory Dialogue. The surgical anatomy of the hand is extremely complex in terms of structure and function. Exploration of the anatomy of the hand in different contexts: its representation in art forms, the historical development of the study of hand anatomy, current operative techniques for reconstruction, advances in tissue engineering, and the future of hand transplantation.
2 units, Win (Chang, J)

SURG 101. Regional Study of Human Structure
Preference to seniors. Lectures in regional anatomy and dissection of the human cadaver; the anatomy of the trunk and limbs through the dissection process, excluding the head and neck.
5 units, Win (Gosling, J; Whitmore, I)

SURG 102. Theory of International Humanitarian Surgery
(Same as SURG 202) Open to undergraduate, graduate, and medical students. Focus is on understanding the ethics of international surgical aid, the role of surgery in international health, humanitarian theory, the role of students in the international health setting, and business and medicine in the social sector. Opportunities for international health service. Guest speakers include world-renowned physicians, CEOs, and public health workers.
4 units, Win (Samagh, S; Samagh, S; Laub, D; Chang, J)

SURG 111A. Emergency Medical Technician (EMT-1): Training and Application
(Same as SURG 211A) (Graduate students register for 211A.) Basics of life support outside the hospital setting; readiness training for emergencies on- or off-campus. Topics include emergency patient assessments, and cardiac, respiratory, and neurological emergencies. Lectures, practicals, and applications. Upon completion of SURG 111A,B,C or 211A,B,C, students are eligible to sit for the National Registry EMT licensure exam. Prerequisites: CPR certification; application (see http://surg211.stanford.edu), and consent of instructor.
3 units, Aut (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 111B. Emergency Medical Technician (EMT-1): Training and Application
(Same as SURG 211B) (Graduate students register for 211B.) Continuation of 111A/211A. Approach to traumatic injuries. Topics include head, neck, and trunk injuries, bleeding and shock, burn emergencies, and environmental emergencies. Lectures, practicals, and applications. Upon completion of SURG 111A,B,C or 211A,B,C, students are eligible to sit for the National Registry EMT licensure exam. Prerequisite: 111A/211A and consent of instructor.
3 units, Win (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 111C. Emergency Medical Technician (EMT-1): Training and Application
(Same as SURG 211C) (Graduate students register for 211C.) Continuation of 111B/211B. Special topics in EMS; topics include pediatric, obstetric, and gynecologic emergencies, EMS operations, mass casualty incidents, and assault. Lectures, practicals, and applications. Upon completion of SURG 111A,B,C or 211A,B,C, students are eligible to sit for the National Registry EMT certification exam. Prerequisite: 111B/211B, CPR-PR certification, and consent of instructor.
3 units, Spr (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 112A. Advanced Reading and Teaching for the EMT-1
(Same as SURG 212A) Advanced Topics in EMS and training in teaching BLS skills (Graduate students register for 212A.) Topics include advanced airway and stroke management, abdominal emergencies, and prehospital pharmacology. Prerequisites: SURG 111/211 A-C (or equivalent EMT-Basic certification), CPR for the Professional Rescuer certification, and consent of instructor. May be repeated for credit.
2-3 units, Aut (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 112B. Advanced Reading and Teaching for the EMT-1
(Same as SURG 212B) Advanced Topics in EMS and training in teaching BLS skills. (Graduate students register for 212B.) Topics include advanced assessment and treatment of the undifferentiated trauma patient (including advanced airway management, monitoring, and evaluation) and prehospital care in nontraditional locations. Prerequisites: SURG 111/211 A-C (or equivalent EMT-Basic certification), CPR for the Professional Rescuer certification, and consent of instructor. May be repeated for credit.
2-3 units, Win (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 112C. Advanced Reading and Teaching for the EMT-1
(Same as SURG 212C) Advanced Topics in EMS and training in teaching BLS skills. (Graduate students register for 212C.) Topics include advanced assessment and treatment of patients in difficult and advanced situations - mass casualty incidents, assaults, pediatrics; and advanced emergency skills - ultrasound, suturing. Prerequisites: SURG 111/211 A-C (or equivalent EMT-Basic certification), CPR for the Professional Rescuer certification, and consent of instructor. May be repeated for credit.
2-3 units, Spr (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 199. Undergraduate Research
Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.
1-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

GRADUATE COURSES IN SURGERY

SURG 201. Basic Cardiac Life Support
All medical students must be certified in Basic Cardiac Life Support before the end of the first (autumn) quarter. Students who provide documentation of certification received within six months prior to the date of matriculation will be exempted from the requirement. The course teaches one- and two-rescuer CPR, management of an obstructed airway, and CPR for infants and children. Upon completion of the course, students receive an American Heart Association certificate in BLS.
1 unit, Aut (Smith-Coggins, R)

SURG 202. Theory of International Humanitarian Surgery
(Same as SURG 102) Open to undergraduate, graduate, and medical students. Focus is on understanding the ethics of international surgical aid, the role of surgery in international health, humanitarian theory, the role of students in the international health setting, and business and medicine in the social sector. Opportunities for international health service. Guest speakers include world-renowned physicians, CEOs, and public health workers.
4 units, Win (Samagh, S; Samagh, S; Laub, D; Chang, J)

SURG 203A. Human Anatomy
Introduction to human structure and function presented from a medical perspective. Introduction to the physical examination and frequently-used medical imaging techniques. Students are required to attend lectures, actively participate in seminar groups, and engage in dissection of the human body in the anatomy laboratory. Surgery 203A presents structure of the thorax, abdomen, pelvis and limbs.
11 units, Aut (Gosling, J; Whitmore, I)

SURG 203B. Human Anatomy
Continues the introduction to human structure and function from a medical perspective, the physical examination, and frequently-used medical imaging techniques. Students are required to attend lectures, actively participate in seminar groups, and engage in dissection of the human body in the anatomy laboratory. Surgery 203B presents structure of the head, neck and back.
4 units, Win (Gosling, J; Whitmore, I)

SURG 204. Introduction to Surgery and Surgical Techniques
Innovative introduction to the various aspects of surgery directed at pre-clinical MD students. Students participate in interactive clinical surgical scenarios animated by attending physicians. Covers the spectrum of surgical specialties. Includes scrubbing techniques, basic instrument handling, and the opportunity to scrub in on operations at Stanford Hospital.
1 unit, Aut (Greco, R)

SURG 205. Advanced Suturing Techniques
Builds upon skills taught in the Surgical Interest Group's introductory suturing workshops. Techniques such as suturing in a hole, suturing different tissues, and hand, instrument and laparoscopic knot tying.
1 unit, Aut (Woodard, G; Visser, B)

SURG 208. Plastic Surgery Tutorial
Diagnosis, theory, and practice of plastic and reconstructive surgery. Limited to two students per faculty member.
2 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)

SURG 209. Plastic Surgery
Students participate in plastic and reconstructive surgery as functioning members of the clinical team. Students are exposed to operative surgery, emergency and trauma care, evaluation of operative candidates in the outpatient setting, and also attend teaching conferences. Limited to four students. Prerequisite: completion of first year or clinical experience.
1-18 units, Aut (Chang, J; Schendel, S; Lorenz, H; Longaker, M; Gurtner, G; Girod, S; Hentz, V; Lee, G), Win (Chang, J; Schendel, S; Lorenz, H; Longaker, M; Gurtner, G; Girod, S; Hentz, V; Lee, G), Spr (Staff), Sum (Chang, J; Schendel, S; Lorenz, H; Lo

SURG 211A. Emergency Medical Technician (EMT-1): Training and Application
(Same as SURG 111A) (Graduate students register for 211A.) Basics of life support outside the hospital setting; readiness training for emergencies on- or off-campus. Topics include emergency patient assessments, and cardiac, respiratory, and neurological emergencies. Lectures, practicals, and applications. Upon completion of SURG 111A,B,C or 211A,B,C, students are eligible to sit for the National Registry EMT licensure exam. Prerequisites: CPR certification; application (see http://surg211.stanford.edu), and consent of instructor.
3 units, Aut (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 211B. Emergency Medical Technician (EMT-1): Training and Application
(Same as SURG 111B) (Graduate students register for 211B.) Continuation of 111A/211A. Approach to traumatic injuries. Topics include head, neck, and trunk injuries, bleeding and shock, burn emergencies, and environmental emergencies. Lectures, practicals, and applications. Upon completion of SURG 111A,B,C or 211A,B,C, students are eligible to sit for the National Registry EMT licensure exam. Prerequisite: 111A/211A and consent of instructor.

3 units, Win (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 211C. Emergency Medical Technician (EMT-1): Training and Application
(Same as SURG 111C) (Graduate students register for 211C.) Continuation of 111B/211B. Special topics in EMS; topics include pediatric, obstetric, and gynecologic emergencies, EMS operations, mass casualty incidents, and assault. Lectures, practicals, and applications. Upon completion of SURG 111A,B,C or 211A,B,C, students are eligible to sit for the National Registry EMT certification exam. Prerequisite: 111B/211B, CPR-PR certification, and consent of instructor.

3 units, Spr (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 212A. Advanced Reading and Teaching for the EMT-1
(Same as SURG 112A) Advanced Topics in EMS and training in teaching BLS skills (Graduate students register for 212A.) Topics include advanced airway and stroke management, abdominal emergencies, and prehospital pharmacology. Prerequisites: SURG 111/211 A-C (or equivalent EMT-Basic certification), CPR for the Professional Rescuer certification, and consent of instructor. May be repeated for credit.

2-3 units, Aut (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 212B. Advanced Reading and Teaching for the EMT-1
(Same as SURG 112B) Advanced Topics in EMS and training in teaching BLS skills. (Graduate students register for 212B.) Topics include advanced assessment and treatment of the undifferentiated trauma patient (including advanced airway management, monitoring, and evaluation) and prehospital care in nontraditional locations. Prerequisites: SURG 111/211 A-C (or equivalent EMT-Basic certification), CPR for the Professional Rescuer certification, and consent of instructor. May be repeated for credit.

2-3 units, Win (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 212C. Advanced Reading and Teaching for the EMT-1
(Same as SURG 112C) Advanced Topics in EMS and training in teaching BLS skills. (Graduate students register for 212C.) Topics include advanced assessment and treatment of patients in difficult and advanced situations - mass casualty incidents, assaults, pediatrics; and advanced emergency skills - ultrasound, suturing. Prerequisites: SURG 111/211 A-C (or equivalent EMT-Basic certification), CPR for the Professional Rescuer certification, and consent of instructor. May be repeated for credit.

2-3 units, Spr (Gilbert, G; D'Souza, P; Espinoza, N)

SURG 223. Wilderness Medicine
Open to all students. Wilderness-related illnesses and injuries; framework for dealing with emergencies in the backcountry. Hands-on workshops. Topics include high altitude medicine, backcountry orthopedics, hypothermia, snake envenomations, search and rescue, and travel medicine. Opportunity for certification in Wilderness First Aid.

4 units, Spr (Weiss, E; Lipman, G)

SURG 225. Transplantation Science
Offers medical students a more in-depth understanding of the field of transplantation. Develops an understanding of transplant immunology, tissue typing, immunopharmacology, and transplant pathology. Includes such topics as heart and heart/lung transplantation, kidney/pancreas transplantation, liver transplantation, bone marrow transplantation, and donor issues. Focus is on the field of transplantation as it relates to preoperative care and management of patients prior to transplantation as well as the long term care and follow-up of patients. Guest speakers. Prerequisites: SURG 218 (Anatomy); BIOC 200 (may be taken concurrently).

1 unit, Win (Esquivel, C)

SURG 230. Obesity in America
Prevalence and effects of the obesity epidemic in America and the growing prevalence of associated comorbidities such as diabetes, hypertension, hyperlipidemia, sleep apnea, and joint problems. Risk factors, multi-disciplinary treatment options, the role of food in society, patients' perspectives, and current research in the field. Includes fieldtrips to grocery stores and restaurants.

1 unit, Win (Morton, J; Woodard, G)

SURG 231. Healthcare in Developing Countries: Haiti and Beyond
Lunchtime lecture series open to all students. Aims to answer the deceptively simple question: How can we improve health in the devoping world? Topics range from water sanitation to supply-side incentivization, from family planning to war zone surgery. Students gain useful skills for experience in international medicine. MD students and are eligible to apply for a sub-internship in surgery at Hopital Albert Schweitzer in Dechapelle, Haiti.

1 unit, Spr (Greco, R)

SURG 370. Medical Scholars Research
Provides an opportunity for student and faculty interaction, as well as academic credit and financial support, to medical students who undertake original research. Enrollment is limited to students with approved projects.

4-18 units, Aut (Staff), Win (Staff), Spr (Staff), Sum (Staff)