

# School of Medicine

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

Many courses in the School of Medicine are open to any registered Stanford student who has fulfilled the prerequisites, subject to the usual limits of course enrollment and faculty approval. The school also offers courses specifically for undergraduates, as well as graduate-level courses where advanced undergraduates with backgrounds in the life sciences are welcome. Among the undergraduate offerings are numerous Stanford Introductory Seminars for freshmen and sophomores, the Emergency Medical Technician program, Stanford Immersion in Medicine Physician Shadowing, Pre-Vet Advisory, and courses in Community Health, including participation in the Stanford Free Clinics. The school also offers several undergraduate courses through the Department of Biology and the Interdisciplinary Program in Human Biology in the School of Humanities and Sciences.

## 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 Stanford's School of Medicine Master's Degree Programs (<http://med.stanford.edu/ms>) and Ph.D. Programs (<http://med.stanford.edu/phd>) web site. Application information can be found at Stanford's Office of Graduate Admissions (<http://gradadmissions.stanford.edu>) web site.

## 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., M.B.A., Master's of Science in Epidemiology or Health Services Research, or a 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 begin clinical clerkships in June 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 is 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 Stanford's Dual Degree and Multi-Degree Programs ([http://med.stanford.edu/combined\\_degree](http://med.stanford.edu/combined_degree)) web site.

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. 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 the Medical Education at Stanford (<http://med.stanford.edu/md>) web site.

## Multiple-Degree Programs in the School of Medicine M.D./Ph.D.

Many M.D. students undertake a Ph.D. while they are at Stanford. Popular choices are School of Medicine programs in Bioengineering, Biomedical Informatics, or one of the 13 Biosciences home departments. At the School of Engineering, the Biomechanical Engineering M.D./Ph.D. program also makes a special effort to work with M.D. students.

## Medical Scientist Training Program

The Medical Scientist 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 flexibility of curricular and research programs for each trainee. Training for a combined M.D.-Ph.D. includes the same content encountered by students who pursue each degree separately, but the total training time is 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. 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.

## M.D./M.B.A.

M.D.. students interested in combining their medical training with training in business can take advantage of a dual degree M.D./M.B.A. program that allows students to obtain both degrees after completion of a 5-year curriculum. Students must apply to and be admitted by the Stanford Graduate School of Business, at the time of their admission to the medical school or after beginning their M.D.. studies.

## M.D./M.P.H.

A unique collaboration with UC Berkeley allows M.D.. students to pursue and obtain a Master of Public Health degree while still at the Stanford School of Medicine. This dual degree M.D./M.P.H. program is open to M.D. students who participate in the Scholarly Concentration in Community Health. Students must apply to and be admitted by the UC Berkeley program; course work is undertaken at the UC Berkeley campus.

## Ph.D./M.S.M.

The Master of Science in Medicine (<http://msm.stanford.edu>) program admits current Stanford 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 to be 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 co-mentor to discuss translational research needs and help to arrange a short clinical experience. Upon completion of the Program., participating students receive an M.S. in Medicine.

## M.D./M.S. Degrees

**Health Services Research:** The Master's Degree program in Health Services Research is a research-oriented program with a concentration on economics and statistics, outcomes research, cost-effectiveness, and technology assessment. The program is designed to complement training in the medical and social sciences and prepare students for research careers in health services or health policy analysis. The program provides specialized training in selected areas of health care policy, research methodology, and the application of these skills to a specific research problem. Course work requirements allow students to design a program of study suited to their individual backgrounds and interests.

**Epidemiology:** The Graduate Interdisciplinary Program in Epidemiology is a research oriented program that offers instruction and research opportunities leading to the M.S. degree in Epidemiology - the study of the distribution and determinants of diseases in populations.

**Medical Information Sciences:** An option for anyone who wishes to either perform research in Biomedical Informatics as clinical faculty at a school of medicine or for those who wish to continue into the health care industry or government. There is high need for trained individuals who understand the practice of medicine and who are able to develop and implement applications in biomedical informatics.

**Biomechanical Engineering:** Bioengineering is a fusion of engineering and the life sciences that promotes scientific discovery and the invention of new technologies and therapies through research and education. It encompasses both the use of biology as a new engineering paradigm and the application of engineering principles to medical problems and biological systems. The discipline embraces biology as a new science base for engineering.

## M.D./M.P.P. Degree

Matriculated M.D. students from Stanford's School of Medicine may apply for admission to the joint M.P.P./M.D. degree program ([http://publicpolicy.stanford.edu/jt\\_mdmp](http://publicpolicy.stanford.edu/jt_mdmp)). Applications are accepted anytime after a student has completed one year in the M.D. program. Students must obtain the permission of the School of Medicine to participate in the joint degree program. Students are required to devote two continuous years of full-time study to the completion of the first two years of the core M.D. curriculum. Students then devote one continuous academic year of study to the completion of the M.P.P. core curriculum. At other times, the student may be enrolled in either unit and may take courses from either unit to satisfy the joint degree requirements.

## Departmental Dual Degrees

**Education:** The Individually designed M.A. in Education is designed for Stanford doctoral students enrolled outside of the School of Education. Individuals enrolled at the doctoral level at Stanford can be considered for this program.

**E-IPER:** Stanford's Emmett Interdisciplinary Program in Environment and Resources (E-IPER) gives students a focused science, engineering, and technology background, allowing them to integrate science with law and business to address critical environmental and sustainability issues. [http://e-iper.stanford.edu/admissions.jointms\\_application.php](http://e-iper.stanford.edu/admissions.jointms_application.php)

**Public Policy:** Stanford University offers two master's programs in Public Policy. A Master's of Public Policy (M.P.P.) is a two-year professional degree and the Masters of Arts in Public Policy (M.A.) is a one-year non-professional degree. Students currently enrolled in other Stanford graduate programs, and applicants to those programs, may apply for either of the Public Policy master's programs. M.D. students are eligible to apply for a dual M.A. degree program See above for the joint M.D./M.P.P. program.

*Dean:* Lloyd Minor

*Senior Associate Dean for Graduate Education and Postdoctoral Affairs:* Daniel Herschlag

*Senior Associate Dean for Medical Education:* Charles Prober

## Medicine Interdisciplinary Courses

**INDE 200. The Future of Academic Medicine. 1 Unit.**

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

**INDE 201. Practice of Medicine I. 11 Units.**

Six quarter series extending throughout the first two years of the MD program, interweaving core skills training in medical interviewing and the physical examination with other major threads addressing the context of medical practice: information literacy, nutrition principles, clinical epidemiology and biostatistics, evidence-based practice, psychiatry, biomedical ethics, health policy, population health. Core clinical skills are acquired through hands-on practice, and evaluated through an extensive program of simulated medical encounters, in which students interview, examine, and manage patients in a mock clinic. The information literacy thread introduces students to informatics and knowledge management, biomedical informatics, and evidence-based medicine searching. Nutrition principles are acquired through interactive, web-based instruction, and reinforced through problem-based learning cases, which run in parallel to the basic science components over the first year. In epidemiology students learn the taxonomy of epidemiological studies, how to critically read a journal article, and how to recognize and understand the concepts behind different clinical study designs. Topics include bias, confounding, diagnostic testing and screening, and "how statistics can lie." Psychiatry introduces students to the unique role of medical students in talking with patients, the difference between process and content in patient communication, how to respond to breaks in the patient-physician relationship, and the relationship between the quality of the patient-physician interaction and health outcomes. Health care policy covers such topics as health insurance, physician payment, health care costs, access, measurement and improvement of quality, regulation and health care reform. Biomedical ethics includes important ethical issues in medical practice, such as confidentiality, privacy, and ethical issues relating to medical students. The population health curriculum exposes students to concepts of public health, community action, and advocacy, and includes a year-long, community-based project. At the end of this quarter students participate in a performance-based assessment of the medical interview skills.

**INDE 202. Practice of Medicine II. 8 Units.**

Medical interview and physical examination skills, information literacy, nutrition principles, evidence-based practice, health policy, and population health are covered. At the end of this quarter, students participate in a performance-based assessment of their medical interview and physical examination skills. See INDE 201 for a complete description of the Practice of Medicine course series.

**INDE 203. Practice of Medicine III. 8 Units.**

Medical interview and physical examination skills, biomedical literature retrieval and appraisal, nutrition principles, evidence-based practice, biomedical ethics, and population health are covered. Students begin clinical problem-solving sessions to learn the approach to common and important clinical problems. Cases integrate other course themes of population health, evidence-based practice, clinical ethics, nutrition, health policy, and behavioral medicine. Students begin transition from comprehensive to problem-focused patient encounters. Students also gain exposure to geriatrics, pediatrics, and interprofessional healthcare teams, and practice mental health interview skills. At the end of this quarter, students participate in a performance-based assessment of their medical interview and physical examination skills. See INDE 201 for a complete description of the Practice of Medicine course series.

**INDE 204. Practice of Medicine IV. 10 Units.**

The second year of the Practice of Medicine series (INDE 204 and 205) emphasizes clinical reasoning, clinical practicum, and clinical procedures. Students continue clinical problem-solving sessions to learn the approach to common and important clinical problems. Cases integrate other course themes of population health, evidence-based practice, clinical ethics, nutrition, health policy, and behavioral medicine. Students spend one-half day per week in a clinical setting, practicing medical interview, physical examination skills, oral presentations, and clinical note-writing under the mentorship of a clinical tutor. In the practicum, students also gain experience with other practical aspects of patient care. The Clinical Procedures segment introduces common and important procedures in clinical practice, including phlebotomy, intravenous line insertion, and electrocardiography.

**INDE 205. Practice of Medicine V. 8 Units.**

Continued emphasis on clinical reasoning, clinical practicum, and clinical procedures. Students continue clinical problem-solving sessions to learn the approach to common and important clinical problems. Cases integrate other course themes of population health, evidence-based practice, clinical ethics, nutrition, health policy, and behavioral medicine. Students spend one-half day per week in a clinical setting, practicing medical interview, physical examination skills, oral presentations, and clinical note-writing under the mentorship of a clinical tutor. In the practicum, students also gain experience with other practical aspects of patient care. For the Clinical Procedures segment, students will have an opportunity in the Emergency Department to practice performing procedures learned in the previous quarter. At the end of this quarter, students participate in a comprehensive four-station objective structured clinical examination (OSCE) performance-based assessment of their medical interview, physical examination, and clinical problem-solving skills.

**INDE 206. Practice of Medicine VI. 9 Units.**

This last segment of the Practice of Medicine series is an intensive, four-week learning experience to consolidate clinical skills from prior quarters, and a final preparation for transition to clerkships. An extensive series of workshops covers topics such as dermatology, ophthalmology, advanced clinical reasoning, advanced presentations, bedside skills, ethics, palliative medicine, advanced sexual history, electronic medical record, ekg interpretation, intravenous fluid and electrolyte management. Students practice clinical procedures with task trainers and on a cadaver. This quarter also includes a professionalism series to prepare students for entry into clinical practice. Special clinical practice sessions are held as a capstone to clinical skills preparation.

**INDE 207A. Medical Mandarin I: Beginning. 2-3 Units.**

Develops conversational communication skills and essential medical vocabularies. Teaches in 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) as well as daily survival conversations. 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 as well as daily life. Students registering for 3 units participate in clinic visits and field activities.

**INDE 207B. Medical Mandarin II: Intermediate. 2-3 Units.**

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 different tasks such as giving medical instructions and doing labs and tests. Builds working vocabulary for organ system, disease assessment to conduct a full physical exam, and to describe treatment modalities for Chinese-speaking patients (diagnostic and therapeutic). Students registering for 3 units participate in clinic visits and field activities. Prerequisite: one year of college-level Chinese or instructor assessment of fluency.

**INDE 207C. Medical Mandarin III: Advanced. 2-3 Units.**

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 registering for 3 units participate in clinic visits, field activities or projects. Prerequisite: completion of Medical Mandarin II, or advanced Chinese proficiency.

**INDE 207D. Professional Mandarin I. 2-3 Units.**

Designed for students who seek professional development via Mandarin. Coursework includes lectures, online classes, language partnerships, selected topics, projects and field activities. Goal is to enhance students' language abilities as professionals and facilitate a career. Students choose to enroll for 2 units or 3 units depending upon an agreed- upon workload approved by the instructor. Prerequisite: sound preparation in Mandarin as assessed by the instructor.

**INDE 208A. Medical Mandarin I: Beginning. 2-3 Units.**

Continuation of 207A. See description for 207A. Students participating in classroom and online instruction only register for 2 units. Students registering for 3 units participate in clinic visits and field activities as well.

**INDE 208B. Medical Mandarin II: Intermediate. 2-3 Units.**

Continuation of 207B. See description for 207B. Students participating in classroom and online instruction only register for 2 units. Students registering for 3 units participate in clinic visits and field activities as well.

**INDE 208C. Medical Mandarin III: Advanced. 2-3 Units.**

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. 3 units Includes clinic visits and field activities. Prerequisite: completion of 207C, or advanced Chinese proficiency.

**INDE 208D. Professional Mandarin II. 2-3 Units.**

Continuation of INDE 207D. Designed for students who seek professional development via Mandarin. Coursework includes lectures, online classes, language partnerships, selected topics, projects and field activities. Goal is to enhance students' language abilities as professionals and facilitate a career. Students choose to enroll for 2 units or 3 units depending upon an agreed- upon workload approved by the instructor. Prerequisite: INDE 207D.

**INDE 209A. Medical Mandarin III: Beginning. 2-3 Units.**

Continuation of 207A/208A. See description for 207A. Students participating only in classroom and online instruction register for 2 units. Students registering for 3 units participate in clinic visits and field activities as well.

**INDE 209B. Medical Mandarin III: Intermediate. 2-3 Units.**

Continuation of 207B/208B. See description for 207B. Students participating only in classroom and online instruction register for 2 units. Students registering for 3 units participate in clinic visits and field activities as well.

**INDE 209C. Medical Mandarin III: Advanced. 2-3 Units.**

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. 3 units Includes clinic visits and field activities. Prerequisite: completion of 208C or advanced Chinese proficiency.

**INDE 209D. Professional Mandarin III. 2-3 Units.**

Continuation of INDE 208D. Designed for students who seek professional development via Mandarin. Coursework includes lectures, online classes, language partnerships, selected topics, projects and field activities. Goal is to enhance students' language abilities as professionals and facilitate a career. Students choose to enroll for 2 units or 3 units depending upon an agreed- upon workload approved by the instructor. Prerequisite: INDE 208D.

**INDE 211. Creative Writing. 1 Unit.**

For medical students - all levels of writing skill. Examines uses of creative writing, including understanding the experience of medical training. May be repeated for credit.

**INDE 212. Medical Humanities and the Arts. 2 Units.**

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.

**INDE 214. Stanford Medical Student Journal. 1 Unit.**

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 Journal. 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 Journal is published two to three times per year and highlights the diverse talents of Stanford medical students in both scientific writing and the humanities.

**INDE 215. Queer Health and Medicine. 1 Unit.**

Explores specific, pertinent, and timely issues impacting the health of the lesbian, gay, bisexual, and transgender community; examines the role of the primary care physician in addressing the health care needs of this community. Guest lecturers provide a gender-sensitive approach to the medical care of the LGBT patient, breaking down homophobic barriers and reaffirming patient diversity. May be repeated for credit.

**INDE 216. Cells to Tissues. 3 Units.**

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, connective tissue, muscle, bone and cartilage. Patient presentations and small group discussions of current medical literature illustrate how cell biology influences medical practice.

**INDE 217. Physician Scientist Hour. 1 Unit.**

Enrollment is limited to MD, PhD, or MD-PhD students interested in careers as physician scientists. Focus is on aspects of developing careers in biomedical research through a mix of research lectures, clinical case presentations, and physician-scientist guest speakers.

**INDE 221. Human Health and Disease I. 11 Units.**

First course in three-sequence Human Health and Disease block. Focus is on structure, function, disease, and therapeutics of the respiratory system and the cardiovascular system. 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).



**INDE 222. Human Health and Disease III. 15 Units.**

Structure, function, disease, and therapeutics of the renal/genito-urinary 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 .

**INDE 223. Human Health and Disease IV. 11 Units.**

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.

**INDE 225. Popular and Clinical Nutrition: Food Facts, Fads, and Pharmacology. 1 Unit.**

Designed for medical students and other health care professionals. Lunchtime lectures review the epidemiological and clinical research related to eating patterns and misconceptions of the public, the mechanisms of pharmacological effects of food, and related topics common to patient nutritional concerns. Topics include fad diets, the impact of dietary addiction, longevity associated with caloric restriction, toxins in foods and the action of phytonutrients. Epidemiological, clinical, and biochemical studies are reviewed in the discussion of these and other topics.

**INDE 226. History of Medicine Online. 1 Unit.**

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. Enroll in Axess, then ask cwpsupport to be added to the course site as a student.

**INDE 227. Careers in Medicine: Pathways in the Medical Sciences. 1 Unit.**

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.

**INDE 228. Career Transition Planning: Taking Action Today for a Successful Tomorrow. 1 Unit.**

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 environments, 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.

**INDE 229. Managing Difficult Conversations. 1 Unit.**

(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. Enrollment limited to 20 medical students (2nd year and beyond) and 15 2nd year MBA students.

**INDE 230. Topics in Scientific Management. 1 Unit.**

Designed for postdocs and advanced graduate students. Reviews management skills necessary for successfully assuming leadership roles in scientific research. Addresses some of the most difficult aspects of developing, directing, and managing people and projects and running a research group, especially issues that new faculty have traditionally learned by trial and error over a number of years. Topics include: the faculty job search process and strategies, key elements in starting a lab, basic principles regarding legal dimensions of scientific activity (intellectual property, royalties, links with industry), team science, research ethics, communication and negotiation skills, and writing and securing grants.

**INDE 231A. Career Transitions: Academia. 1 Unit.**

Preference to PhD students in their fourth year or beyond and postdocs/fellows in their intended final year. Restricted to students in Biosciences and the School of Medicine. Focus is on practical, hands-on preparation of application materials (including interview and job talk) for academic positions. Provides practical, hands-on preparation for Bioscience PhD students, postdoctoral fellows and research/clinical trainees ready to apply to academic positions. It not only previews the academic hiring process, including tips from experienced faculty from different types of institutions, but also guides participants in the preparation and polishing of their application materials for success on the job market.

**INDE 231B. Career Prep and Practice: Academia. 1 Unit.**

Open to all Biosciences PhD students, postdocs/fellows and medical students/residents/fellows planning to pursue academic careers. Focus is on gaining a deeper understanding of faculty roles and responsibilities. Topics include how to balance teaching, research, service, lab set-up, grantwriting and publishing at different types of institutions. Features panels of experienced faculty members from different academic environments. More information available on course website: [web.stanford.edu/class/inde231b](http://web.stanford.edu/class/inde231b).

**INDE 232. Introduction to Academic Medicine for Physician-Scientists. 3 Units.**

Open only to accepted MSTP students. Presentations by Stanford faculty on professional development topics, including: choosing a dissertation advisor, giving oral presentations, writing a grant proposal, attending scientific meetings, developing a research career. Substantial writing component.

**INDE 233. Medical Education Seminar Series. 1 Unit.**

For pre-clinical and clinical medical students. A series of sessions rotating among the following formats: Medical Education journal club; education works-in-progress; topics in medical education design, implementation, and evaluation; teaching M&M; hot topics and controversies in medical education. May be repeated for credit.

**INDE 234. Introduction to Writing Research Proposals. 3 Units.**

Practical instruction in research proposal writing. Suitable for advanced graduate students. Substantial writing component. Enrollment by instructor approval only.

**INDE 235. Wilderness Leadership and Mentorship Skills for Medical Students. 2 Units.**

For MD/Master of Medicine wilderness pre-orientation trip (SWEAT) leaders. Training to engage with and prepare incoming first-year medical students for the rigors of medical school. Topics include: fundamentals of wilderness survival, wilderness equipment use, wilderness first aid, camping, outdoor leadership, mentorship, team building, improvisation, risk management, cultural competency, professionalism as a physician, reflection and resiliency, first-year curriculum, stress management and coping. Guest lectures from Stanford faculty, emergency medicine physicians, National Outdoor Leadership School wilderness instructors, learning strategy specialists, and mentorship development specialists.

**INDE 236. Introduction to Teaching and Mentoring. 1 Unit.**

Enrollment limited to medical students. An introduction to medical education teaching principles and skills. Topics include assessment of current teaching skills, reviews of performance, giving appropriate learner feedback, and best practices for interactive teaching. Also introduces the literature around the value of peer mentoring in the medical setting and how to apply this information. Recommended for medical students interested in or currently serving as teaching assistants or interested in future academic positions.

**INDE 239. Preparation and Practice for Biotechnology Business and Finance. 2 Units.**

Open to School of Medicine graduate students, medical students, residents and fellows. Focus on the process of new company development and skills for success in biotechnology business, entrepreneurship and finance, including management/leadership skill development, awareness of business terminology and theory. Topics include: financial analysis, feasibility, IP, case practice.

**INDE 255A. Health Policy, Finance and Economics I. 1 Unit.**

Open to medical students and resident physicians. Introduction to basic concepts and current issues in health policy, health finance, and health economics. Goals are to promote understanding of the forces that shape healthcare; to integrate medical students with graduate medical education (residents); to motivate participants to pursue further scholarly activity in these subjects through coursework, graduate programs or research. Team taught by world-renowned experts in their respective fields. Prerequisite: instructor consent.

**INDE 255B. Health Policy, Finance and Economics II. 1 Unit.**

Continuation of INDE 255A. Open to medical students and resident physicians. Introduction to basic concepts and current issues in health policy, health finance, and health economics. Goals are to promote understanding of the forces that shape healthcare; to integrate medical students with graduate medical education (residents); to motivate participants to pursue further scholarly activity in these subjects through coursework, graduate programs or research. Team taught by world-renowned experts in their respective fields. For medical students 255A is not prerequisite to 255B. Prerequisite: instructor consent.

**INDE 260. Journeys in Women's Health and Sex and Gender in Medicine. 1 Unit.**

Sponsored by the Stanford WSDM Center. Course focuses on health research on women and sex differences in medicine, acknowledges the "wisdom" of research and education on sex (e.g. chromosomes, gonads, gonadal hormones) and gender (sociocultural) factors influencing health. Brings alumni to share their professional journeys in the world of Women and Sex Differences in Medicine. Meets Women's Health Scholarly Concentration Requirement.  
Same as: FEMGEN 260X

**INDE 263. Microbiology and Infectious Diseases I. 4 Units.**

First course in a four-course series exploring microbiology, pathogenesis, and clinical issues associated with infectious diseases. Patient cases springboard discussion on viral, bacterial, fungal, protozoal and helminthic pathogens. Online videos and self-assessments followed by interactive sessions and problem sets.

**INDE 264. Microbiology and Infectious Diseases II. 1 Unit.**

Second course in a four-course series exploring microbiology, pathogenesis, and clinical issues associated with infectious diseases. Patient cases springboard discussion on viral, bacterial, fungal, protozoal and helminthic pathogens. Online videos and self-assessments followed by interactive sessions and problem sets.

**INDE 295. Bioethics and Anthropology Interdisciplinary Directed Individual Study. 3-5 Units.**

Supervised individualized study in bioethics and anthropology for a qualifying paper, research proposal, or project with an individual faculty member. May be repeated for credit.

**INDE 297. Reflections, Research, and Advances in Patient Care. 4 Units.**

Required for all MD students enrolled in clerkships at Stanford affiliated sites. Two-year curriculum designed to provide structured time for students to step back from clerkships, in order to promote reflection on and reinforcement for their learning in the clinical environment. Goals are: to discuss and reflect upon critical experiences in clerkships; to provide continuity of instruction in translational science topics across the curriculum; to reinforce and extend the study of behavioral, cultural, ethical, social and socioeconomic topics introduced in the Practice of Medicine course sequence; to expose students to recent advances in medical discoveries, emphasizing their application to clinical practice (translational medicine); and to develop research and critical thinking skills, acquiring new information in areas related to the Scholarly Concentrations. Components of this curriculum include Doctoring with CARE small groups, the Advances and Reflections in Medicine lecture/seminar series, and Scholarly Concentration breakout groups. The Friday afternoon lecture/seminars explore advances in biomedical sciences with applications to medical practice (translational medicine) as well as faculty career pathways, reflections on doctoring, and the context of medicine in society. All students in clinical clerkships must participate in all aspects of RRAP Days. Prerequisite: Concurrent enrollment in clinical clerkships.

**INDE 298. Women's Health Independent Project. 1 Unit.**

Required for Women's Health Scholarly Concentration. Students pursue individual projects under the supervision of a faculty member. Prerequisite: consent of instructor.

## Medicine Courses

**MED 1A. Leadership in Multicultural Health. 2 Units.**

Designed for undergraduates serving as staff for the Stanford Medical Youth Science Summer Residential Program (SRP). Structured opportunities to learn, observe, participate in, and evaluate leadership development, multicultural health theories and practices, and social advocacy. Utilizes service learning as a pedagogical approach to developing an understanding of the intersections between identity, power and privilege and disparities (health, education, environment), fostering knowledge and skills to become social advocates to address forms of inequities. Students explore approaches for identifying and tackling issues of equity (health and education) as well as learn fundamental skills necessary to implement activities for the Summer Residential Program.

**MED 1B. Identity, Power and Privilege in Multicultural Health. 1 Unit.**

An independent study service learning course designed to develop students' understanding of the intersection between identity, power, privilege, and disparities (health, education, environment). Students submit a written reflective term paper based on their experience as staff for the Summer Residential Program as well as their understanding of how constructs of identity, power and privilege impact low-income and underrepresented students in their pursuit of higher education. Prerequisite MED 1A.

**MED 10SC. Responses to the AIDS Epidemic. 2 Units.**

This course focuses on the HIV epidemic, contrasting the origin and spread of HIV and AIDS in Africa and the emergence of HIV in the U.S., in particular the history of HIV in San Francisco and the Bay Area. We will meet the people and visit the institutions which played key roles in the Public Health prevention, care, and treatment of HIV in San Francisco and consider the impact of HIV globally in our thinking about epidemic disease and the international responses to HIV. This will include key locations in the City, including the AIDS Grove, San Francisco General Hospital, the San Francisco Department of Public Health, the Castro, and local AIDS service organizations. Students will also hear from patients, physicians, and activists who are living with AIDS. We will also meet with scientists at UCSF, Stanford, and local pharmaceutical companies who are at the forefront of new prevention, therapeutic, and diagnostic research. By examining the relationship between the emergence of Gay activism and AIDS in California and New York and the pandemic in Southern Africa, the course will emphasize the multi-disciplinary and multi-sector approach to epidemic infectious disease. How do scientists, patients, epidemiologists, pharmaceutical companies, and policymakers develop effective responses to the AIDS epidemic? What are we learning from Africa and what can Africa learn from us about how communities react to deadly threats from infectious disease. AIDS experts from the Stanford community and Africa are invited to share their perspectives with us. In preparation for the seminar, you will be required to read *And the Band Played On* and Barnett and Whiteside's *AIDS in the Twenty-First Century* and selected scientific articles. As part of a group, you will also develop an AIDS-related project of your choice which you will present on the last day of class.

**MED 27SI. Alternative Spring Break: Healthcare of Underserved Communities in Central California. 1 Unit.**

Pre-field group directed reading for Alternative Spring Break: Healthcare of Underserved Communities in Central California.

**MED 28SI. Alternative Spring Break: Health Accessibility. 1 Unit.**

Alternative Spring Break class. Pre-field course for students participating in the Health Accessibility Alternative Spring Break trip. Focuses on the Bay Area and the current state of the U.S. healthcare system, how it has developed, and how it can be transformed to ensure greater accessibility for all.

**MED 50Q. Respiration. 3 Units.**

Preference to sophomores. Topics include: the biological basis for use of oxygen for aerobic metabolism in animals, human lung physiology and pathophysiology, comparative physiology of respiration in fish, birds and mammals, new insights into mammalian lung development, current challenges in human respiratory health including air pollution and lung cancer. Student presentations on specific topics based on literature research developed in consultation with the instructor. Application required.

**MED 51Q. Palliative Medicine, Hospice and End of Life Care for Diverse Americans. 3 Units.**

Introduces students to changing demographics of the aging and dying population in the United States. Topics include current issues in palliative medicine, hospice and end-of-life care for an increasingly diverse population. Includes simulated video case studies, real patient case discussions and collaborative field project. Application required.

**MED 70Q. Cancer and the Immune System. 2 Units.**

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.

**MED 71N. Hormones in a Performance-Enhanced Society. 3 Units.**

(Formerly 117Q) Preference to freshmen. Explores how the availability of hormone therapy has affected various aspects of daily lives. Topics include the controversies concerning menopause and its treatment; use of hormones in athletics; cosmetic use of hormones to enhance growth, strength, and libido; use of hormones as anti-aging drugs; and how the hormone system has influenced our notions of gender. Includes the biochemistry and physiology of the human endocrine system; how hormones influence behavior, and how to read a scientific paper.

**MED 73N. Scientific Method and Bias. 3 Units.**

Offers an introduction to the scientific method and common biases in science. Examines theoretical considerations and practical examples where biases have led to erroneous conclusions, as well as scientific practices that can help identify, correct or prevent such biases. Additionally focuses on appropriate methods to interweave inductive and deductive approaches. Topics covered include: Popper's falsification and Kuhn's paradigm shift, revolution vs. evolution; determinism and uncertainty; probability, hypothesis testing, and Bayesian approaches; agnostic testing and big data; team science; peer review; replication; correlation and causation; bias in design, analysis, reporting and sponsorship of research; bias in the public perception of science, mass media and research; and bias in human history and everyday life. Provides students an understanding of how scientific knowledge has been and will be generated; the causes of bias in experimental design and in analytical approaches; and the interactions between deductive and inductive approaches in the generation of knowledge.

**MED 86Q. Seeing the Heart. 2 Units.**

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.

**MED 87Q. Women and Aging. 5 Units.**

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. Service Learning Course (certified by Haas Center).

**MED 88Q. Dilemmas in Current Medical Practice. 3 Units.**

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.

**MED 94Q. Hormones, Health, and Disease. 2 Units.**

Preference to sophomores. The role of hormones in maintaining health; how abnormalities in hormones cause disease. Topics include: the pituitary, the master gland; thyroid hormones and metabolism; insulin and diabetes; adrenal steroids and hypertension; vitamin D, parathyroid hormone, and osteoporosis; sex hormones, birth control, pregnancy, and menopause; androgens, erectile dysfunction, and athletic performance; cholesterol, obesity, and cardiovascular risk. Recommended: background in human biology and physiology.

**MED 108Q. Human Rights and Health. 3 Units.**

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.

**MED 120N. Pathophysiology of Diseases of the Heart. 3 Units.**

Preference to freshmen. Introduces students to the anatomy, physiology, pathology and clinical aspects that comprise the discipline of cardiovascular medicine. Topics will include explanations of such pathologic states as heart attack, stroke, congestive heart failure, cardiac rhythm disturbances, and sudden cardiac death. Introduction to the underlying principles of diagnosis and treatment of heart disease are included in the syllabus.

**MED 121. Translational Research and Applied Medicine. 3 Units.**

(Same as MED 221; graduate and medical students enroll in MED 221) Open to undergraduate students, this course enables students to learn basic principles in the design, performance and analysis of translational medical research studies. The course includes both didactic seminars from experts in translational medicine as well as the opportunity to design and present a translational research project.

**MED 129. Health Care Systems Around the World. 4 Units.**

This course will explore the role of health care systems in societies around the world, identifying the common challenges facing health care systems and how different institutional structures in different countries perform in response to these challenges. We will structure the course around general conceptual frameworks related to key health system institutions (including financing, insurance, provider payment, patient cost-sharing, and the regulation of medical technology). From this foundation, we will draw on the experience of individual countries (high and low income, with heavy chronic disease and infectious disease burdens) to illustrate the function of these institutions under real-world circumstances observed around the globe.

Same as: HUMBIO 129W

**MED 130. The Practice of Happiness. 1 Unit.**

The Practice of Happiness is a 1-unit credit course that provides students with tools and strategies to develop a sustainable approach to their happiness and well-being. Students will learn breathwork- and meditation-based processes to decrease stress and increase happiness and peace. In addition, students will also engage in community-building group discussions, interactive processes, and study happiness-based research to discover for themselves what happiness is, and how it can be sustained as a personal practice. In addition to weekly sessions, there are 3 mandatory back-to-back sessions over a weekend in the quarter- hours will be Friday: 6:30pm - 10pm; Saturday/Sunday: 1pm - 5pm (exact dates TBD). See [yesplus.stanford.edu](http://yesplus.stanford.edu) for further insight into the program. Enrollment limited; priority to residents of Castano Hall; others selected by application.

**MED 143A. Patient Health Education in Community Clinics. 2 Units.**

Open to undergraduate, graduate, and medical students. Principles of health education, health coaching, 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. Application required.

Same as: MED 243A

**MED 143B. Patient Health Education in Community Clinics - Practicum. 2 Units.**

Open to undergraduate, graduate, and medical students. For students who have completed MED 143A/243A and currently volunteer in one of the course-affiliated clinic sites. Objective is to expand health education skills, discuss more complex health education topics, and reflect upon experiences in the clinic. Includes readings and online reflections. Prerequisite: successful completion of MED 143A/243A.

Same as: MED 243B

**MED 143C. Patient Health Education in Community Clinics - Practicum. 2 Units.**

Open to undergraduate, graduate, and medical students. For students currently volunteering in one of the course-affiliated clinic sites. Objective is to expand health education skills, discuss more complex health education topics, and reflect upon experiences in the clinic. Includes readings and online reflections. Pre-requisites: MED 143A/243A, Med 143B/243B.

Same as: MED 243C

**MED 145. Alternative Spring Break: Confronting HIV/AIDS in San Francisco. 2 Units.**

Preparation for the Alternative Spring Break trip. Current issues regarding HIV/AIDS worldwide and in the United States, with a specific focus on San Francisco. Topics include biology, transmission, prevention, pharmaceutical development, discrimination, stigma, access to health care, and perspectives of affected communities. See [asb.stanford.edu](http://asb.stanford.edu) for more information.

**MED 147. Methods in Community Assessment, Evaluation, and Research. 3 Units.**

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.

Same as: MED 247

**MED 149. Medical Interpreting at the Cardinal Free Clinics: The Qualified Bilingual Student Program. 2 Units.**

The quality of health care often depends as much on the interpreter as the provider. This foundation courses prepares bilingual students to work as medical interpreters in hospital and clinic settings. Students learn basic interpreting skills; ethics; communication techniques; medical vocabulary; key healthcare information; communication skills for advocacy; how to draft practical, working solutions, and professional development. By application only; must be an accepted Cardinal Free Clinic (CFC) interpreter volunteer. Applications accepted in Fall for Winter quarter and in Winter for Spring quarter. Students registering for this 2-unit course are required to interpret at the clinic a minimum of 2 weekend sessions; upon completion of this course, students can continue to volunteer at CFC for academic credit.

**MED 150SI. Clinical Foundations for Patient Navigators at Arbor Free Clinic. 1 Unit.**

Addresses key areas of learning for patient navigator volunteers at Arbor Free Clinic. Prepares patient navigators for their clinical role. Enrollment limited to current, active patient navigator volunteers.

**MED 157. Foundations for Community Health Engagement. 3 Units.**

Open to undergraduate, graduate, and MD students. Examination and exploration of community health principles and their application at the local level. Designed to prepare students to make substantive contributions in a variety of community health settings (e.g. clinics, government agencies, non-profit organization, advocacy groups). Topics include community health assessment; health disparities; health promotion and disease prevention; strategies for working with diverse, low-income, and underserved populations; and principles of ethical and effective community engagement.



**MED 158A. From Foodies to Freegans: Food Popular Topics in the Silicon Valley. 2 Units.**

This is a discussion-based survey course to introduce the complexities of many "pop topics" in food, such as obesity, sustainability, and local vs. organic food. Course offered over two quarters; second part is MED 158B. The course focuses on Silicon Valley and is taught through a food justice lens. The goal is to provide knowledge and new frameworks for conceptualizing food that transform the way students think about, eat, and purchase food. Furthermore, course content is aligned with Community Engaged Learning (CEL) so that students have the opportunity to collaborate with local partners to complete community-based projects relevant to course topics. Coursework involves class participation, critical reflection, and three papers written for different audiences in the food space.

**MED 158B. From Foodies to Freegans Practicum. 2 Units.**

Students work toward making change in the food system. This course matches students with a community partner in the local area who is working to address food issues, broadly defined. There are many ways to make meaningful impact, including working at Second Harvest Food Bank as a Health Ambassador, or to assist with the Healthy Cornerstore initiatives or Garden to Table with the Hispanic Chamber of Commerce. Provides students with the opportunity to apply their academic area of concentration within a community-based context that fits their interests. Med 158A highly recommended but not required as a prerequisite.

**MED 159A. Service-Learning in Migrant Health. 2 Units.**

Examines the intersection of migration, poverty and health; provides opportunities for engagement directly with community partners working with Bay Area Mexican migrant populations. Weekly knowledge and skills-building sessions covering the process of migration; the demographic characteristics of the local migrant population; the health and socioeconomic status of local migrant populations; current initiatives to improve their quality of life and well-being. Service opportunities include participation in community organizing; health education seminars; and health screening activities. Prerequisite: intermediate/advanced level of Spanish language proficiency.

**MED 159B. Service-Learning in Migrant Health. 2 Units.**

Second quarter of two-quarter series. Examines the intersection of migration, poverty and health; provides opportunities for engagement directly with community partners working with Bay Area Mexican migrant populations. Weekly knowledge and skills-building sessions covering the process of migration; the demographic characteristics of the local migrant population; the health and socioeconomic status of local migrant populations; current initiatives to improve their quality of life and well-being. Service opportunities include participation in community organizing; health education seminars; and health screening activities. Prerequisites: intermediate/advanced level of Spanish language proficiency, MED 159A.

**MED 160. Physician Shadowing: Stanford Immersion in Medicine Series. 1 Unit.**

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.

Same as: SIMS

**MED 182. Early Clinical Experience at the Cardinal Free Clinics. 1-2 Unit.**

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. One unit of credit for students who volunteer a minimum of twice per month. Two units of credit for students whose volunteer commitment is greater than twice per quarter. By application only. Visit <http://cfc.stanford.edu> for more information. Same as: MED 282

**MED 184. Team Leadership in the Cardinal Free Clinics. 1 Unit.**

Open to Steering Committee and Managers of Cardinal Free Clinics. Introduction to skills for effective leadership, including: conflict resolution, team dynamics, leadership styles, personality types, giving and receiving feedback, and group decision-making. Utilizes hands-on-activities and real-life clinic scenarios. Applied learning through shifts at the Cardinal Free Clinics and related project work.

Same as: MED 284

**MED 199. Undergraduate Research. 1-18 Unit.**

Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

**MED 200. The Medical Device Entrepreneur's Course Primer. 1 Unit.**

This course provides students and entrepreneurs a solid understanding of the complex US regulatory framework governing medical devices, in vitro diagnostics and drug-device combination products. Through class lectures, research and team assignments, class participants learn the key regulatory, clinical and ethical issues in biomedical product innovation. Focuses specifically on US investigational and marketing submission types and preparation of submission outlines, key steps to develop a product that will meet US regulatory requirements and development of regulatory strategy for a novel product. While there are no technical prerequisites, the course projects are challenging, and thus are more suitable for graduate and advanced undergraduate students.

**MED 200A. Practical Applications for Qualitative Data Analysis. 2 Units.**

(Same as PEDS 202A) First quarter of a two-quarter course. Gain experience analyzing qualitative data using qualitative analysis software (i.e. Nvivo, Dedoose). Conduct analysis using your own or existing data sources. Explore multiple qualitative data analysis topics through class lectures, foundational readings and hands-on learning. Core topics include: grounded theory, qualitative data analysis approaches, software-based analysis, cleaning and coding of data, and interpreting data. Note: Preference will be given to medical students and undergraduate students that have successfully completed an introductory qualitative methods course. Enrollment in subsequent MED 202B required.

**MED 200B. Practical Applications for Qualitative Data Analysis. 2 Units.**

(Same as PEDS 202B) Second quarter of a two-quarter course provides hands-on experience summarizing qualitative data and describing findings for dissemination. Final course product will be a draft manuscript for submission with students listed as co-authors. Core topics include: identifying themes and representative quotes, community-engaged dissemination, abstract submission, posters, oral presentations, manuscript writing, and journal selection. Prerequisite: Successful completion of MED 202A.

**MED 200SI. Primary Care Presentations. 1 Unit.**

This course is a lecture series offered during the winter quarter. The aim of this seminar is to allow medical students to experience the mindset of primary care physicians in real time. Classes feature presentations of patient cases submitted by Stanford faculty. Faculty presenters are provided with the diagnostic information for the cases in a sequential manner during and not in advance of each class, allowing students to learn from the thought process of physicians in real time as they put together the differential diagnosis, interpret diagnostic information, deliberate treatment and management options, and discuss other thoughts about the cases.

**MED 201. Internal Medicine: Body as Text. 1 Unit.**

Body as Text refers to the idea that every patient's body tells a story. The narrative includes the past and present of a person's social and medical condition; it is a demonstration of the phenotype. The art of reading the body as text was at its peak in the first half of the 20th century, but as technology has become ascendant, bedside skills and the ability to read the text have faded. Beyond scientific knowledge and medical facts, it is this often forgotten craft which is at the heart of the excitement of being an internist. This course introduces students to the art of the clinical exam, to developing a clinical eye, and learning to see the body in a completely different way.

**MED 202. Alternative Spring Break: Rural and American Indian Health Disparities. 3 Units.**

Open to MD, graduate, and undergraduate students. Classroom preparation followed by a one week spring break service learning experience on a reservation in South Dakota. Introduces students to the challenges and promise of Native American and rural health care, and the role of communities as leaders and problem solvers. Includes lectures, discussion and readings pertaining to Native American culture, current research in Native American health, and the methods and practice of community based participatory research. Culminates in formulation of a plan for communicating with and engaging community partners in South Dakota: Indian Health Services, Habitat for Humanity, Porcupine Clinic, Teach for America, and Sinte Gleska University.

**MED 203. Patient Partner Skills: in Care Transitions. 1 Unit.**

A clinical and quality improvement experience for pre-clerkship medical students. The course provides early clinical experience for pre-clerkship medical students, to engage with patients in multiple healthcare environments (inpatient medicine/outpatient medicine/skilled nursing facilities/patients' quest; homes). Students gain an understanding of the challenges patients face during the transitions, and learn and help design quality improvement initiatives to improve patient outcomes and reduce readmissions. Course features include working as part of an interdisciplinary healthcare team and promoting patient empowerment. Students work closely with Stanford Department of Medicine faculty and with Stanford Internal Medicine residents, and are trained to use health coaching, motivational interviewing, and shared decision-making skills.

**MED 204. Access and Delivery of Essential Medicines to Poor and Underserved Communities. 1 Unit.**

Student initiated lecture series. Guest speakers. Topics include: neglected diseases, underserved and impoverished markets, disease profiles of lower and middle income countries, pricing and distribution of biomedical end products, intellectual property in medicine and its effect on delivery of healthcare.

**MED 206. Meta-research: Appraising Research Findings, Bias, and Meta-analysis. 3 Units.**

Open to graduate, medical, and undergraduate students. Appraisal of the quality and credibility of research findings; evaluation of sources of bias. Meta-analysis as a quantitative (statistical) method for combining results of independent studies. Examples from medicine, epidemiology, genomics, ecology, social/behavioral sciences, education. Collaborative analyses. Project involving generation of a meta-research project or reworking and evaluation of an existing published meta-analysis. Prerequisite: knowledge of basic statistics.

Same as: CHPR 206, HRP 206, STATS 211

**MED 207. History of Medicine. 1 Unit.**

Begins with studying Shamanistic medicine, practiced by humans throughout the globe, for millennia. Covers magico-religious medicine developed in ancient Egypt, Mesopotamia and Greece; the 4th Century BC with Hippocrates beginning to separate medicine from religion and magic; the slow progress in ancient Rome, the medieval period, and during the Renaissance; and the acceleration in the pace of discoveries in the last few centuries, as medicine became more scientific, complex, and specialized as Pasteur developed the germ theory of disease, Darwin and Mendel's publications begin the development of Evolution and of Genetics, Watson and Crick solved the mystery of DNA structure, organ transplants began, and imaging procedures such as CT and MRI came into being. Lectures are profusely illustrated, and, for the sake of comparison, two equally ancient systems of medicine, the traditional Chinese and the Vedic, are briefly reviewed.

**MED 209. Health Law: Quality and Safety of Care. 3 Units.**

(Same as LAW 727) Concerns about the quality of health care, along with concerns about its cost and accessibility, are the focal points of American health policy. Considers how legislators, courts, and professional groups attempt to safeguard the quality and safety of the health care patients receive. The course approaches "regulation" in a broad sense. Focuses on regimes for determining who may deliver health care services (e.g. licensing and accreditation agencies), legal and ethical obligations providers owe to patients (e.g. confidentiality, informed consent), individual and institutional liability for substandard care, and various proposals for reforming the medical malpractice system. Includes discussion of the Patient Protection and Affordable Care Act (aka, "Obamacare"), which is launching many new initiatives aimed at assuring or improving health care quality.

**MED 212. Methods for Health Care Delivery Innovation, Implementation and Evaluation. 2 Units.**

Preference given to postgraduate fellows and graduate students. Focus is on implementation science and evaluation of health care delivery innovations. Topics include implementation science theory, frameworks, and measurement principles; qualitative and quantitative approaches to designing and evaluating new health care models; hybrid design trials that simultaneously evaluate implementation and effectiveness; distinction between quality improvement and research, and implications for regulatory requirements and publication; and grant-writing strategies for implementation science and evaluation. Students will develop a mock (or actual) grant proposal to conduct a needs assessment or evaluate a Stanford/VA/community intervention, incorporating concepts, frameworks, and methods discussed in class. Priority for enrollment for CHPR 212 will be given to CHPR master's students.

Same as: CHPR 212, HRP 218

**MED 213. Compassion Cultivation for the Physician-in-Training. 1 Unit.**

Provides mentored practice and growth in students' knowledge, skills and attitudes in compassion cultivation for one's self and others. Integrates traditional contemplative practices with contemporary psychology and scientific research on compassion.

**MED 215A. Health Policy PhD Core Seminar I--First Year. 2 Units.**

Seminar series is the core tutorial for first-year Health Policy and Health Services Research graduate students. Major themes in fields of study including health insurance, healthcare financing and delivery, health systems and reform and disparities in the US and globally, health and economic development, health law and policy, resource allocation, efficiency and equity, healthcare quality, measurement and the efficacy and effectiveness of interventions. Blocks of session led by Stanford expert faculty in particular fields of study.

Same as: HRP 201A

**MED 215B. Health Policy PhD Core Seminar II--First Year. 2 Units.**

Second in a three-quarter seminar series is the core tutorial for first-year Health Policy and Health Services Research graduate students. Major themes in fields of study including health insurance, healthcare financing and delivery, health systems and reform and disparities in the US and globally, health and economic development, health law and policy, resource allocation, efficiency and equity, healthcare quality, measurement and the efficacy and effectiveness of interventions. Blocks of session led by Stanford expert faculty in particular fields of study.

Same as: HRP 201B

**MED 215C. Health Policy PhD Core Seminar III--First Year. 2 Units.**

Third in a three-quarter seminar series is the core tutorial for first-year Health Policy and Health Services Research graduate students. Major themes in fields of study including health insurance, healthcare financing and delivery, health systems and reform and disparities in the US and globally, health and economic development, health law and policy, resource allocation, efficiency and equity, healthcare quality, measurement and the efficacy and effectiveness of interventions. Blocks of session led by Stanford expert faculty in particular fields of study.

Same as: HRP 201C

**MED 220. Literature and Human Experimentation. 3-5 Units.**

This course introduces students to the ways literature has been used to think through the ethics of human subjects research and experimental medicine. We will focus primarily on readings that imaginatively revisit experiments conducted on vulnerable populations: namely groups placed at risk by their classification according to perceived human and cultural differences. We will begin with Mary Shelley's *Frankenstein* (1818), and continue our study via later works of fiction, drama and literary journalism, including Toni Morrison's *Beloved*, David Feldshuh's *Miss Evers Boys*, Hannah Arendt's *Eichmann* and Vivien Spitz's *Doctors from Hell*, Rebecca Skloot's *Immortal Life of Henrietta Lacks*, and Kazuo Ishiguro's *Never Let Me Go*. Each literary reading will be paired with medical, philosophical and policy writings of the period; and our ultimate goal will be to understand modes of ethics deliberation that are possible via creative uses of the imagination, and literature's place in a history of ethical thinking about humane research and care.

Same as: AFRICAAM 223, COMPLIT 223, CSRE 123B, HUMBIO 175H

**MED 221. Translational Research and Applied Medicine. 2-3 Units.**

(Same as MED 121; undergraduate students enroll in MED 121) Open to graduate students and medical students, this course enables students to learn basic principles in the design, performance and analysis of translational medical research studies. The course includes both didactic seminars from experts in translational medicine as well as the opportunity to design and present a translational research project. Students enrolling for 3 units are paired with a TRAM translational research project and work as a team with TRAM trainees and faculty on a weekly basis, as arranged by the instructor, and present a final project update at the end of the quarter.

**MED 222. The Medical Malpractice System. 2 Units.**

Focus is on policy and law pertaining to the medical malpractice system in the U.S. Readings include a mix of articles from the medical, law and health policy literatures, as well as some legal cases. Includes problem-based learning and small group work.

**MED 223. Cardiovascular and Pulmonary Sciences Seminar. 3 Units.**

Weekly modified journal club primarily for CVP Scholarly Application students, Cardiovascular Institute graduate students, clinical and research fellows, and faculty. Open to other graduate students and medical students (Advanced undergraduate students with permission of instructor). Each meeting begins with an overview of a particular area by a faculty member, followed by presentation of a seminal paper in that area by a postdoctoral fellow or a graduate student. Discussion follows the presentation, after which the faculty moderator meets separately with the students for further questions and discussion.

**MED 225. U.S. Human Rights NGOs and International Human Rights. 1 Unit.**

(Same as LAW 782) Many US human rights non-government organizations, including the US philanthropic sector, work on international human rights. The US government also engages with the private sector in "partnerships" that twins US foreign aid human rights action with corporate expertise. This weekly series will feature speakers who lead these human rights NGOs, philanthropic enterprises, and corporate partnerships, and also policy experts and scholars, to explore the pro's and con's of this scenario. Same as: ETHICSOC 15R, IPS 271A, POLISCI 203

**MED 226. Practical Approaches to Global Health Research. 3 Units.**

Enrollment limited to graduate students; undergraduates in their junior or senior year may enroll with consent of instructor only. Introduces research methods for conducting studies involving health in low-income context. Focuses on developing a concept note to support a funding proposal. addressing research question of student's interest. Skills developed include developing a compelling research question; synthesizing a focused literature review; selecting and adapting appropriate study design, target population, sampling methods, data collection and analysis; addressing human subject issues; developing productive cross-collaboration.

Same as: HRP 237, IPS 290

**MED 227. Bedside Ultrasound. 1-2 Unit.**

For preclinical or clinical medical students, and others with permission. Introduces students to diagnostic ultrasound at the bedside. The normal anatomy of the heart, abdomen, and pelvis pertinent to ultrasound is taught. Some pathology involving these areas is also introduced. As the students' proficiency increases, those electing to can visit the Pacific Free Clinic to be introduced to scanning patients. 1 unit for class attendance only 2 units for class attendance and participation in the Pacific Free Clinic.

**MED 228. Physicians and Social Responsibility. 1 Unit.**

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.

**MED 229. Introduction to Global Health. 1 Unit.**

Provides an overview of global health and how it is similar to and different from public health and tropical medicine. Topics include the evolution, economics, politics of global health, major players in global health, and issues of geography, politics, humanitarianism, human rights, science, research, culture and disease.

**MED 232. Discussions in Global Health. 2 Units.**

The goal of this interactive series is to encourage students to think broadly about the variety of activities encompassed within global health and the roles of various entities, including NGOs, governments, and healthcare providers, in responding to large-scale health crises, building health systems, and caring for patients in developing countries. Examines challenges in global health such as organizing medical responses to natural disasters, providing healthcare to societies in conflict, and integrating traditional and modern approaches to healing. Case studies are used to critique strategies employed by organizations that work to improve medical care in poor settings.

**MED 233. Global Health: Beyond Diseases and International Organizations. 4 Units.**

Provides multidisciplinary trainees insight into over-arching themes of global health. Topics include systemic issues affecting healthcare progress globally, ethical and thoughtful approaches to solving these issues, as well as economics, water sanitation, public health, organizations in global health, human rights, involvement in NGOs, ethics of overseas work, and other non-medical aspects of this subject. This course will cover some of the essentials of patient care while working in the field as well including child health care, malaria, TB, and HIV.



**MED 234. Literature and Global Health. 3-5 Units.**

This course examines the ways writers in literature and medicine have used the narrative form to explore the ethics of care in what has been called the developing world. We will begin with an introduction to global health ethics as a field rooted in philosophy and policy that address questions raised by practice in resource-constrained communities abroad. We will then spend the quarter understanding the way literature may deepen and even alter those questions. For instance: how have writers used scenes of practice in Africa, the Caribbean or South Asia to think through ideas of mercy, charity, beneficence and justice? How differently do they imagine such scenes when examining issues of autonomy, paternalism and language? To what extent, then, do novels and memoirs serve as sites of ethical inquiry? And how has literary study revealed the complexities of narrating care for underserved communities, and therefore presented close reading as a mode of ethics for global health? Readings will include prose fiction by Albert Camus, Joseph Conrad, Amitav Ghosh and Susan Sontag as well as physician memoirs featuring Frantz Fanon, Albert Schweitzer, Abraham Verghese and Paul Farmer.

Same as: AFRICAAM 229, AFRICAST 229, COMPLIT 229, CSRE 129B, FRENCH 229, HUMBIO 175L

**MED 235. Designing Research-Based Interventions to Solve Global Health Problems. 3-4 Units.**

The excitement around social innovation and entrepreneurship has spawned numerous startups focused on tackling world problems, particularly in the fields of education and health. The best social ventures are launched with careful consideration paid to research, design, and efficacy. This course offers students insights into understanding how to effectively develop, evaluate, and scale social ventures. Using TeachAIDS (an award-winning nonprofit educational technology social venture used in 78 countries) as a primary case study, students will be given an in-depth look into how the entity was founded and scaled globally. Guest speakers will include world-class experts and entrepreneurs in Philanthropy, Medicine, Communications, Education, and Technology. Open to both undergraduate and graduate students.

Same as: AFRICAST 135, AFRICAST 235, EDUC 135, EDUC 335, HRP 235, HUMBIO 26

**MED 236. Economics of Infectious Disease and Global Health. 3 Units.**

Introduction to global health topics such as childhood health, hygiene, drug resistance, and pharmaceutical industries from an economic development perspective. Introduces economic concepts including decision-making over time, externalities, and incentives as they relate to health.

Same as: HUMBIO 124E

**MED 237. Health Law: Improving Public Health. 3 Units.**

(Same as Law 762) Examines how the law can be used to improve the public's health. Major themes explored include: what authority does the government have to regulate in the interest of public health? How are individual rights balanced against this authority? What are the benefits and pitfalls of using laws and litigation to achieve public health goals? Investigates these issues in several contexts, including the control and prevention of infectious disease, laws aimed at preventing obesity and associated noncommunicable diseases, tobacco regulation, ensuring access to medical care, reproductive health, lawsuits against tobacco, food and gun companies, and public health emergencies.

**MED 240. Sex and Gender in Human Physiology and Disease. 2-3 Units.**

Chromosomal, hormonal and environmental influences that lead to male and female reproductive systems and neuroendocrine regulation and intersex variants. Masculinizing and feminizing effects of endogenous and exogenous sex hormones and other factors, in particular gender, on the musculoskeletal, neurological, cardiovascular, immunological and other systems and tissues, e.g. adipose, skin, etc. over the lifecourse, from conception to puberty, through reproductive phases (including changes during the menstrual cycle up to and beyond menopause in women, and with aging in both sexes). Transgender health issues. Guest lecturers.

Prerequisite: Human Biology core or equivalent, or consent of instructor. Undergraduate students must enroll for 3 units.

Same as: FEMGEN 241, HUMBIO 140

**MED 241. Clinical Skills for Patient Care in Free Clinics. 1 Unit.**

Enrollment in this course is by application only for advanced volunteers at the Cardinal Free Clinics. Focus is on preparing students to gain early clinical experience by teaching basic skills such as taking patient histories, working with interpreters, providing motivational interviewing, and presenting cases to medical students or physicians. Students learn through classroom lectures and practice sessions. Upon successful completion of a competency assessment, students are able to serve in a clinic role in the Cardinal Free Clinics. Prerequisite: Advanced standing as a volunteer at the Cardinal Free Clinics.

**MED 242. Physicians and Human Rights. 1 Unit.**

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.

**MED 243A. Patient Health Education in Community Clinics. 2 Units.**

Open to undergraduate, graduate, and medical students. Principles of health education, health coaching, 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.

Application required.

Same as: MED 143A

**MED 243B. Patient Health Education in Community Clinics - Practicum. 2 Units.**

Open to undergraduate, graduate, and medical students. For students who have completed MED 143A/243A and currently volunteer in one of the course-affiliated clinic sites. Objective is to expand health education skills, discuss more complex health education topics, and reflect upon experiences in the clinic. Includes readings and online reflections. Prerequisite: successful completion of MED 143A/243A.

Same as: MED 143B

**MED 243C. Patient Health Education in Community Clinics - Practicum. 2 Units.**

Open to undergraduate, graduate, and medical students. For students currently volunteering in one of the course-affiliated clinic sites. Objective is to expand health education skills, discuss more complex health education topics, and reflect upon experiences in the clinic. Includes readings and online reflections. Pre-requisites: MED 143A/243A, Med 143B/243B.

Same as: MED 143C

**MED 246. The Medical Interview for Spanish Speakers. 1 Unit.**

Student led forum for practicing and learning medical Spanish related specifically to the medical interview. Prepares clinical students to interact more effectively with Spanish speaking patients in clinics. Classes are topical; each class includes a demonstration, medical vocabulary practice, and conversational practice on the topic of the day.



**MED 247. Methods in Community Assessment, Evaluation, and Research. 3 Units.**

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.

Same as: MED 147

**MED 248. Student Rounds. 1 Unit.**

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.

**MED 252. Outcomes Analysis. 4 Units.**

Methods of conducting empirical studies which use large existing medical, survey, and other databases to ask both clinical and policy questions. Econometric and statistical models used to conduct medical outcomes research. How research is conducted on medical and health economics questions when a randomized trial is impossible. Problem sets emphasize hands-on data analysis and application of methods, including re-analyses of well-known studies. Prerequisites: one or more courses in probability, and statistics or biostatistics.

Same as: BIOMEDIN 251, HRP 252

**MED 253. Applied Grant-Writing Skills for Community and Clinical Research. 2 Units.**

Skill-building in writing scientific research proposals. Topics include: grant proposal preparation; scientific literature review; developing research aims; decision-making on study design & methodology; planning statistical analyses; determining research compliances, timelines and resources. Students develop drafts of potential projects, peer-review and critique writing samples, and receive detailed feedback from instructor on all aspects of research projects.

**MED 255. The Responsible Conduct of Research. 1 Unit.**

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. Prerequisite: research experience recommended.

**MED 255C. The Responsible Conduct of Research for Clinical and Community Researchers. 1 Unit.**

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. Graduate students required to take RCR who are or will be conducting clinical research are encouraged to enroll in this version of the course. Prerequisite: research experience recommended.

**MED 257A. Community Health Advocacy. 2 Units.**

First of a three-quarter course series providing students with knowledge and concrete skills for working with and advocating for underserved populations. Through coursework and placements in community health clinics and social service organizations, students broaden and deepen their understanding of the social and economic determinants of health, how they impact underserved populations, and the various levels at which these challenges can be addressed. Fellows engage in structured activities centered around supporting the mission of placement organizations. Students must apply and be accepted into the program the winter preceding enrollment; application information at [och.stanford.edu](http://och.stanford.edu). Additional prerequisites: Med 157 or equivalent coursework. Spanish language proficiency required for most placements.

**MED 257B. Community Health Advocacy. 2 Units.**

Second of a three-quarter course series that provides students with knowledge and concrete skills for working with and advocating for underserved populations. Through coursework and placements in community health clinics and social service organizations, student will broaden and deepen their understanding of the social and economic determinants of health, how they impact underserved populations, and the various levels at which these challenges can be addressed. Student will engage in structured activities that center around supporting the mission of their placement organization: direct service with clients and design and implementation of a capacity-building project. Weekly Monday evening classroom meetings serve as a forum for teaching and training, discussion of class readings and placement experiences, project development, and troubleshooting and support. Prerequisites: MED 257A.

**MED 257C. Community Health Advocacy. 2 Units.**

Third of a three-quarter course series that provides students with knowledge and concrete skills for working with and advocating for underserved populations. Through coursework and placements in community health clinics and social service organizations, students broaden and deepen their understanding of the social and economic determinants of health, how they impact underserved populations, and the various levels at which these challenges can be addressed. Student engage in structured activities that center around supporting the mission of their placement organization: direct service with clients and design and implementation of a capacity-building project. Weekly evening classroom meetings serve as a forum for teaching and training, discussion of class readings and placement experiences, project development, and troubleshooting and support. Prerequisites: MED 257A/B.

**MED 258A. Policy Advocacy in Community Health. 2 Units.**

In order to affect broad-based change in the health of populations, advocates must look upstream to the social and economic factors that impact health. Most powerful among these factors are the policies that shape our lives and the context in which we make individual and collective decisions. This course gives students the skills and tools to influence the policy process through various avenues, including legislative and media advocacy. Students select a current community health issue of interest and track relevant policy initiatives and media coverage of the issue to serve as the foundation for the application of real-time advocacy strategies. Prerequisites: MED 257A or consent of instructor.

**MED 259. Oaxacan Health on Both Sides of the Border. 2 Units.**

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; 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. Service Learning Course (certified by Haas Center). Prerequisite: application and acceptance into the Community Health in Oaxaca Summer Program (<http://och.stanford.edu/oaxaca.html>).

**MED 260. HIV: The Virus, the Disease, the Research. 3-4 Units.**

Open to medical students, graduate students in biological sciences, undergraduates with strong biological background. Topics: immunopathogenesis immune deficits, opportunistic infections including TB, and malignancies; genomics viral genetic analyses that have traced the origin of HIV-1 and HIV-2 to primates, dated the spread of infection in humans, and characterized the evolution of the virus within infected individuals; antiretroviral drug development identification of drug targets, structure-based drug design, overcoming drug resistance, pivotal clinical trials, and role of community activism; clinical management solutions in high- and low-income countries; vaccine development learning from past failures and the future of engineering the human immune response. 4 units includes a final project assigned in consultation with the instructor to fit the individual student's background and area of HIV interest.  
Same as: IMMUNOL 260

**MED 262. Economics of Health Improvement in Developing Countries. 5 Units.**

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 ECON 102B.  
Same as: ECON 127

**MED 263. Advanced Decision Science Methods and Modeling in Health. 3 Units.**

Advanced methods currently used in published model-based cost-effectiveness analyses in medicine and public health, both theory and technical applications. Topics include: Markov and microsimulation models, model calibration and evaluation, and probabilistic sensitivity analyses. Prerequisites: a course in probability, a course in statistics or biostatistics, a course on cost-effectiveness such as HRP 392, a course in economics, and familiarity with decision modeling software such as TreeAge.  
Same as: HRP 263

**MED 271. Global Biodesign: Medical Technology in an International Context. 1-3 Unit.**

(Same as OIT 587) This course examines the development and commercialization of innovative medical technologies in different global settings. Faculty and guest speakers from the medtech field will discuss the status of the industry, as well as opportunities in and challenges to medical technology innovation unique to seven primary geographic regions: Africa, China, Europe, India, Japan, United States and Latin America. Students will be exposed to the biodesign innovation process, which provides a proven approach for identifying important unmet medical needs and inventing meaningful solutions to address them. They will also explore key differences between the covered geographies, which range from emerging markets with vast bottom-of-the-pyramid and growing middle class populations, to well-established markets with sophisticated demands and shifting demographics. The class will utilize real-world case studies and class projects (for 3-unit students) to promote engagement and provide a hands-on learning experience. There is no 2 unit option for this course.  
Same as: BIOE 371

**MED 272A. Biodesign Innovation: Needs Finding and Concept Creation. 4 Units.**

This is the first quarter of a two-quarter course series (OIT 384/OIT 385). In this course, students learn how to develop comprehensive solutions (most commonly medical devices) to some of the most significant medical problems. The first quarter includes an introduction to needs finding methods, brainstorming and concept creation. Students learn strategies for understanding and interpreting clinical needs, researching literature and searching patents. Working in small entrepreneurial multidisciplinary teams, students gain exposure to clinical and scientific literature review, techniques of intellectual property analysis and feasibility, basic prototyping and market assessment. Students create, analyze and screen medical technology ideas, and select projects for future development. Final presentations at the end of the winter quarter to a panel of prominent inventors and investors in medical technology provide the impetus for further work in the spring quarter. Course format includes expert guest lecturers (Thu: 4:15 to 6:15 pm), faculty-led practical demonstrations and coaching sessions, and interactive team meetings (Tues: 4:15 to 6:15 pm). Projects from previous years included: prevention of hip fractures in the elderly; methods to accelerate healing after surgery; less invasive techniques for bariatric surgery; point of care diagnostics to improve emergency room efficiency; novel devices to bring specialty-type of care to primary care community doctors. More than 300,000 patients have been treated to date with technologies developed as part of this program and more than thirty venture-backed companies were started by alums of the program. Students must apply and be accepted into the course. The application is available online at <http://biodesign.stanford.edu/bdn/courses/bioe374.jsp>.  
Same as: BIOE 374A, ME 368A

**MED 272B. Biodesign Innovation: Concept Development and Implementation. 4 Units.**

Two-quarter sequence (see OIT384 for complete description of the sequence). The second quarter focuses on how to take a conceptual solution to a medical need forward into development and potential commercialization. Continuing work in teams with engineering and medical colleagues, students will learn the fundamentals of medical device prototyping; patent strategies; advanced planning for reimbursement and FDA approval; choosing a commercialization route (licensing vs. start-up); marketing, sales and distribution strategies; ethical issues including conflict of interest; fundraising approaches and cash requirements; financial modeling; essentials of developing a business or research plan/canvas; and strategies for assembling a development team. Final project presentations are made to a panel of prominent venture and corporate investors. New students (i.e. students who did not take OIT384 in the winter quarter) may be admitted, depending on team needs. Candidates need to submit an application at <http://biodesign.stanford.edu/bdn/courses/bioe374app.jsp> by March 1.  
Same as: BIOE 374B, ME 368B

**MED 273. BIODESIGN FOR MOBILE HEALTH. 1-3 Unit.**

This seminar examines the emerging mobile health industry. Mobile health is the provision of health services and information via mobile technologies such as mobile phones and wearable sensors. Faculty from Stanford University and other academic institutions and guest lecturers from the mobile health industry discuss the driving needs, opportunities and challenges that characterize the emerging mobile health innovation landscape, and present an overview of the technologies, initiatives and companies that are transforming the way we access health care today.  
Same as: BIOE 273

**MED 274. Design for Service Innovation. 4 Units.**

(Same as OIT 343/01) Open to graduate students from all schools and departments. An experiential project course in which students work in multidisciplinary teams to design new services to address the needs of medically patients. Project teams partner with "safety net" hospitals and clinics to find better ways to deliver care to the low income and uninsured patients these institutions serve. Students learn proven innovation processes from experienced GSB, d. school, and SoM faculty, interface with students from across the university, and have the opportunity to see their ideas translated into improvements in the quality and efficiency of healthcare in the real world. Prerequisite: admission to the course is by application only. Applications available at <http://DesignForService.stanford.edu>. Applications must be submitted by November 16, 2011. Same as: BIOE 372, HRP 274

**MED 275B. Biomedical Innovation Incubator. 2-5 Units.**

Introduction to medical device design and prototyping. Regulatory aspects, marketing, venture capital. 2 unit option: weekly seminar series and assignments; open to all. 5 unit option: weekly seminar series, hands-on medical device prototyping project in conjunction with Stanford Medical Faculty. 5 unit option by application only. Graduate students may take project option for 3 units. Project application and more information at [bit.ly/ssbincubator](http://bit.ly/ssbincubator).

**MED 282. Early Clinical Experience at the Cardinal Free Clinics. 1-2 Unit.**

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. One unit of credit for students who volunteer a minimum of twice per month. Two units of credit for students whose volunteer commitment is greater than twice per quarter. By application only. Visit <http://cfc.stanford.edu> for more information. Same as: MED 182

**MED 283A. L-CHAMP Year 2. 1 Unit.**

Restricted to MD students who have completed MED 281 ABC. Emphasis on health coaching in clinical settings. Repeatable for credit with instructor request; approval. Prerequisites: Successful completion of MED 281A, 281B and 281C.

**MED 283B. L-CHAMP Year 2. 1 Unit.**

Restricted to MD students who have completed MED 281A, 281B, and 281C. Second year sequence for L-CHAMP with emphasis on health coaching in clinical settings. Repeatable for credit with instructor request; approval. Prerequisites: Successful completion of MED 281A, 281B and 281C.

**MED 284. Team Leadership in the Cardinal Free Clinics. 1 Unit.**

Open to Steering Committee and Managers of Cardinal Free Clinics. Introduction to skills for effective leadership, including: conflict resolution, team dynamics, leadership styles, personality types, giving and receiving feedback, and group decision-making. Utilizes hands-on-activities and real-life clinic scenarios. Applied learning through shifts at the Cardinal Free Clinics and related project work. Same as: MED 184

**MED 289. Introduction to Bioengineering Research. 1-2 Unit.**

Preference to medical and bioengineering graduate students with first preference given to Bioengineering Scholarly Concentration medical 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. Students and faculty make presentations during the course. Students expected to make presentations, complete a short paper, read selected articles, and take quizzes on the material. Same as: BIOE 390

**MED 290. Independent Study with the Program in Bedside Medicine. 1-5 Unit.**

Students work with their faculty mentor on projects and studies that are broadly centered around the following questions: How do we teach and emphasize to students, residents, physicians (and beyond) in the medical field the need to master bedside skills? How does bedside medicine effect patient care? How has patient care changed with the omnipresence of technology in our lives? How is bedside medicine going to change in the next few decades, centuries? In investigating these questions, students utilize scientific articles and data, engage patients, and collaborate with BedMed faculty and staff. Independent study projects culminate in a presentation to the BedMed team, with the potential for posters or manuscripts. Students paired with faculty based on their area of interest and faculty/project needs. As the Program in Bedside Medicine emphasizes the human connection with patients, students are encouraged to engage patients within our program for teaching sessions, research studies, among other projects. Most of the faculty students with whom students will work are a part of the Stanford Medicine 25 Initiative: <http://stanfordmedicine25.stanford.edu/about/>. Students are encouraged to develop relevant projects with the initiative as a foundation. Enrollment varies with and is limited to faculty need. Repeatable for credit; more than one quarter of commitment expected.

**MED 295. Advanced Cardiac Life Support. 2 Units.**

(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.

**MED 299. Directed Reading in Medicine. 1-18 Unit.**

Prerequisite: consent of instructor.

**MED 370. Medical Scholars Research. 4-18 Units.**

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.

**MED 399. Graduate Research. 1-18 Unit.**

Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.