HEALTH RESEARCH & POLICY (HRP)

HRP 199. Undergraduate Research. 1-18 Unit.
Students undertake investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

HRP 201A. Health Policy Graduate Student Tutorial I. 1-2 Unit.
Seminar series is the core tutorial for first-year Health Policy PhD students and all MS Health Policy 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. 2 unit registration requires written responses to assigned reading questions.
Same as: MED 215A

HRP 201B. Health Policy Graduate Student Tutorial II. 1-2 Unit.
Second in a three-quarter seminar series, the core tutorial is for first-year Health Policy PhD students and all MS Health Policy 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: MED 215B

HRP 201C. Health Policy Graduate Student Tutorial III. 1-2 Unit.
Third in a three-quarter seminar series, the core tutorial is for first-year Health Policy PhD students and all MS Health Policy 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: MED 215C

This introductory course is a practicum in which students will learn the basics of R and use the programming language to analyze health datasets by application of classical statistical methods. A familiarity with basic descriptive and inferential statistics is required. It is assumed that students will have no (or very little) prior experience with R. Class sessions will include some lecture content and hands-on coding by each student on their own computers. Students will practice using R with open-source and simulated datasets. The primary goal of the course is to equip students with a basic and fundamental understanding of R's capabilities, experience using R with practice datasets, and the ability to extend their facility with R as their needs dictate. Students enrolled for 2 units will have additional weekly practice problems assigned.
Same as: CHPR 202

HRP 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, MED 206, STATS 211

HRP 207. Introduction to Concepts and Methods in Health Services and Policy Research I. 2 Units.
Primarily for medical students in the Health Services and Policy Research scholarly concentration. Topics include health economics, statistics, decision analysis, study design, quality measurement, cost benefit and effectiveness analysis, and evidence based guidelines.

HRP 208. Introduction to Concepts and Methods in Health Services and Policy Research II. 2 Units.
Primarily for medical students in the Health Services and Policy Research scholarly concentration; continuation of 207. Topics include health economics, statistics, decision analysis, study design, quality measurement, cost benefit and effectiveness analysis, and evidence based guidelines. Recommended: 207.

HRP 209. Health Law: The FDA. 2-3 Units.
(Same as LAW 3003) Open to law and medical students; other graduate students by consent of instructor. The FDA’s regulatory authority over drugs, biologics, medical devices, and dietary supplements. The nature of the pharmaceutical, biotech, medical device, and nutritional supplement industries.

HRP 211. Law and Biosciences: Neuroscience. 3 Units.
(Same as LAW 3006) Legal, social, and ethical issues arising from advances in neuroscience, including effects upon law and society through improvements in predicting illnesses and behaviors, reading minds through neuroimaging, understanding responsibility and consciousness, treating criminal behavior, and cognitive enhancement.

HRP 212. Cross Cultural Medicine. 3 Units.
Developing interviewing and behavioral skills needed to facilitate culturally relevant health care across all population groups. Discussions focus on explicit and implicit cultural influences operating in formal and informal medical contexts.

HRP 213. Writing in the Sciences. 2-3 Units.
Primarily for medical students in the Clinical Research Scholarly concentration; open to graduate students except Epidemiology graduate students. Development of research questions and plans for statistical analysis. Study design, sample size and power calculations, and statistical analysis of study data. Analytic methods to carry out statistical power and sample size calculations. Prerequisites: 225, and 258 or 259, or consent of instructor.

HRP 214. Scientific Writing. 2-3 Units.
Step-by-step through the process of writing and publishing a scientific manuscript. How to write effectively, concisely, and clearly in preparation of an actual scientific manuscript. Students are encouraged to bring a manuscript on which they are currently working to develop and polish throughout the course. Please note 3-units students will additionally write and revise a manuscript.

HRP 216. Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research. 2-3 Units.
Topics include: advanced aspects of study design and data analyses; evaluating confounding and interaction; modeling continuous characteristics of exposure; building prediction models; methods of summarizing literature and quantifying effect sizes (meta-analysis); handling missing data; and propensity score methods. 3 units requires a data analysis project. Prerequisites: 258 or 261, or consent of instructor.
HRP 218. 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, MED 212

HRP 219. Evaluating Technologies for Diagnosis, Prediction and Screening. 3 Units.
New technologies designed to monitor and improve health outcomes are constantly emerging, but most fail in the clinic and in the marketplace because relatively few are supported by reliable, reproducible evidence that they produce a health benefit. This course covers the designs and methods that should be used to evaluate technologies to diagnose patients, predict prognosis or other health events, or screen for disease. These technologies can include devices, statistical prediction rules, biomarkers, gene panels, algorithms, imaging, or any information used to predict a future or a previously unknown health state. Specific topics to be covered include the phases of test development, how to frame a proper evaluation question, measures of test accuracy, Bayes theorem, internal and external validation, prediction evaluation criteria, decision analysis, net-utility, ROC curves, c-statistics, net reclassification index, decision curves and reporting standards. Examples of technology assessments and original methods papers are used. Knowledge of statistical software is not required, although facility with at least Excel for basic calculations is needed. Open to students with an understanding of introductory biostatistics, epidemiologic and clinical research study design. Undergraduates may enroll with consent of instructor.

HRP 220. Law and the Biosciences: Genetics. 3 Units.
(Same as LAW 3004) Open to all law or medical students; other graduate students by consent of the instructor. Focus is on ethical, legal, and social issues arising from advances in our knowledge of human genetics. Includes forensic uses of genetics, genetic testing, widespread genome sequencing, the consequences of genetics for human reproduction, and the ethics of genomic biobanks for research. Research paper required.

HRP 221. Introduction to Data Management and Analysis in SAS. 2 Units.
Provides hands-on introduction to basic data management and analysis techniques using SAS. Data management topics include: Introduction to SAS and SAS syntax, importing data, creating and reading SAS datasets, data cleaning and validation, creating new variables, and combining data sets. Analysis techniques include: basic descriptive statistics (e.g., means, frequency) and bivariate procedures for continuous and categorical variables (e.g., t-tests, chi-squares).

HRP 222. Epidemiology of Infectious Diseases. 3 Units.
Principles of the transmission of the infectious agents (viruses, bacteria, rickettsiae, mycoplasma, fungi, and protozoan and helminth parasites). The role of vectors, reservoirs, and environmental factors. Pathogen and host characteristics that determine the spectrum of infection and disease. Endemicity, outbreaks, and epidemics of selected infectious diseases. Principles of control and surveillance.

HRP 223. Advanced Epidemiologic Methods. 3 Units.
The theory and applied methods for causal inference in epidemiology. Focus on the potential outcomes model and related methods including inverse probability weights, G-computation, and targeted maximum likelihood estimation. Other contemporary topics may be included. Learning is facilitated through in-class discussion, critical review of peer-reviewed literature, and applied laboratories in R. Prerequisites: HRP 225, HRP 226, and HRP 261 or equivalent (or permission of instructor).

HRP 224. Social Entrepreneurship and Innovation Lab (SE Lab) - Global & Planetary Health. 3-4 Units.
Social Entrepreneurship and Innovation Lab (SE Lab) - Global & Planetary Health is a Collaboratory workshop for students/fellows to design and develop innovative social ventures addressing key challenges in health and the environment, especially in support of the UN Sustainable Development Goals (SDGs 2030). Your mandate in identifying problems and designing solutions is broad and flexible! SE Lab is open to students and fellows across Stanford and combines design thinking exercises, short lectures & case studies, workshops, small group teamwork, presentations, guest speakers, and faculty, practitioner and peer feedback to support you and your team in generating and developing ideas and projects that will change the world! Join SE Lab with an idea or simply the desire to join a team. Enrollment limited to 30. Same as: MED 224, PUBLPOL 224

HRP 225. Introduction to Epidemiologic and Clinical Research Methods. 3 Units.
The skills to design, carry out, and interpret epidemiologic studies, particularly of chronic diseases. Topics: epidemiologic concepts, sources of data, cohort studies, case-control studies, cross-sectional studies, sampling, measures of association, estimating sample size, and sources of bias. Prerequisite: A basic/introductory course in statistics or consent of instructor.

HRP 226. Intermediate Epidemiologic and Clinical Research Methods. 3 Units.
The principles of study design, measurement, confounding, effect modification, and strategies for minimizing bias in clinical and epidemiologic studies. Prerequisite: 225 or consent of instructor.

HRP 227. Law and the Biosciences: Genetics. 3 Units.
(Same as LAW 3004) Open to all law or medical students; other graduate students by consent of the instructor. Focus is on ethical, legal, and social issues arising from advances in our knowledge of human genetics. Includes forensic uses of genetics, genetic testing, widespread genome sequencing, the consequences of genetics for human reproduction, and the ethics of genomic biobanks for research. Research paper required.

HRP 228. Spectrum Scholars Seminar. 1 Unit.
Preference to trainees awarded Stanford internal KL2, TL1 grants. Focus is on students and junior faculty who have received a Spectrum KL2 or TL1 Award. Discussions include progress and challenges involved in starting and conducting clinical research, current courses, time management and resources; support from peers; education and professional development. All scholars are required to attend a weekly seminar series meeting throughout the year that will cover an array of cross-cutting methodological topics with published examples of implementation. Prerequisite: Awarded a Spectrum KL2, TL1 Grant or Spectrum UL1.

HRP 229. Spectrum Scholars Seminar. 1 Unit.
Preference to trainees awarded Stanford internal KL2, TL1 grants. Focus is on students and junior faculty who have received a Spectrum KL2 or TL1 Award. Discussions include progress and challenges involved in starting and conducting clinical research, current courses, time management and resources; support from peers; education and professional development. All scholars are required to attend a weekly seminar series meeting throughout the year that will cover an array of cross-cutting methodological topics with published examples of implementation. Prerequisite: Awarded a Spectrum KL2, TL1 Grant or Spectrum UL1.

HRP 230. Spectrum Scholars Seminar. 1 Unit.
Preference to trainees awarded Stanford internal KL2, TL1 grants. Focus is on students and junior faculty who have received a Spectrum KL2 or TL1 Award. Discussions include progress and challenges involved in starting and conducting clinical research, current courses, time management and resources; support from peers; education and professional development. All scholars are required to attend a weekly seminar series meeting throughout the year that will cover an array of cross-cutting methodological topics with published examples of implementation. Prerequisite: Awarded a Spectrum KL2, TL1 Grant or Spectrum UL1.

HRP 231. Spectrum Scholars Seminar. 1 Unit.
Preference to trainees awarded Stanford internal KL2, TL1 grants. Focus is on students and junior faculty who have received a Spectrum KL2 or TL1 Award. Discussions include progress and challenges involved in starting and conducting clinical research, current courses, time management and resources; support from peers; education and professional development. All scholars are required to attend a weekly seminar series meeting throughout the year that will cover an array of cross-cutting methodological topics with published examples of implementation. Prerequisite: Awarded a Spectrum KL2, TL1 Grant or Spectrum UL1.

HRP 232. Spectrum Scholars Seminar. 1 Unit.
Preference to trainees awarded Stanford internal KL2, TL1 grants. Focus is on students and junior faculty who have received a Spectrum KL2 or TL1 Award. Discussions include progress and challenges involved in starting and conducting clinical research, current courses, time management and resources; support from peers; education and professional development. All scholars are required to attend a weekly seminar series meeting throughout the year that will cover an array of cross-cutting methodological topics with published examples of implementation. Prerequisite: Awarded a Spectrum KL2, TL1 Grant or Spectrum UL1.
HRP 234. Engineering Better Health Systems: modeling for public health. 4 Units.
This course teaches engineering, operations research and modeling techniques to improve public health programs and systems. Students will engage in in-depth study of disease detection and control strategies from a “systems science” perspective, which involves the use of common engineering, operations research, and mathematical modeling techniques such as optimization, queuing theory, Markov-Kernack-McKendrick models, and microsimulation. Lectures and problem sets will focus on applying these techniques to classical public health dilemmas such as how to optimize screening programs, reduce waiting times for healthcare services, solve resource allocation problems, and compare macro-scale disease control strategies that cannot be easily evaluated through randomized trials. Readings will complement the lectures and problem sets by offering critical perspectives from the public health history, sociology, and epidemiology. In-depth case studies from non-governmental organizations, departments of public health, and international agencies will drive the course. Prerequisites: A course in introductory statistics, and a course in multivariable calculus including ordinarily differential equations. Open to upper-division undergraduate students and graduate students. Human Biology majors enroll in HUMBIO 154A. Prerequisite: MATH 51 or CME 100 and Human Biology Core or Bio 141 or BioHopk 174H.
Same as: MED 254

HRP 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. Human Biology majors enroll in HUMBIO 154A. Prerequisite: MATH 51 or CME 100 and Human Biology Core or Bio 141 or BioHopk 174H.
Same as: MED 254

HRP 236. Epidemiology Research Seminar. 1 Unit.
Weekly forum for ongoing epidemiologic research by faculty, staff, guests, and students, emphasizing research issues relevant to disease causation, prevention, and treatment. May be repeated for credit.

HRP 237. Practical Approaches to Global Health Research. 3 Units.
(Formerly IPS 290) How do you come up with an idea for a useful research project in a low resource setting? How do you develop a research question, prepare a concept note, and get your project funded? How do you manage personnel in the field, complex cultural situations, and unexpected problems? How do you create a sampling strategy, select a study design, and ensure ethical conduct with human subjects? This course takes students through the process of health research in under-resourced countries from the development of the initial research question and literature review to securing support and detailed planning for field work. Students progressively develop and receive weekly feedback on a concept note to support a funding proposal addressing a research question of their choosing. Aimed at graduate students interested in global health research, though students of all disciplines interested in practical methods for research are welcome. Undergraduates who have completed 85 units or more may enroll with instructor consent.
Same as: INTLPOL 290, MED 226

HRP 238. Genes and Environment in Disease Causation: Implications for Medicine and Public Health. 2-3 Units.
The historical, contemporary, and future research and practice among genetics, epidemiology, clinical medicine, and public health as a source of insight for medicine and public health. Genetic and environmental contributions to multifactorial diseases; multidisciplinary approach to enhancing detection and diagnosis. The impact of the Human Genome Project on analysis of cardiovascular and neurological diseases, and cancer. Ethical and social issues in the use of genetic information. Prerequisite: Human Biology core or BIO 82 or consent of instructor. This course must be taken for a minimum of 3 units and a letter grade to be eligible for Ways credit.
Same as: HUMBIO 159

HRP 239. Statistical Methods for Group Comparisons and Causal Inference. 3 Units.
See http://rogosateaching.com/stat209/. Critical examination of statistical methods in social science and life sciences applications, especially for cause and effect determinations. Topics: mediating and moderating variables, potential outcomes framework, encouragement designs, multilevel models, heterogeneous treatment effects, matching and propensity score methods, analysis of covariance, instrumental variables, compliance, path analysis and graphical models, group comparisons with longitudinal data. Prerequisite: Intermediate-level statistical methods.
Same as: EDUC 260A, STATS 209

This seminar course is intended to introduce students to the role of policy in public health in the United States. In addition to speakers from the law school, SIEPR, HRP, and School of Medicine, we will be bringing in speakers from outside organizations in the Bay Area with expertise in a variety of issues in public health. There are no assignments and lunch will be provided.

HRP 244. Developing Measurement Tools for Health Research. 2 Units.
The focus of this course is on providing the skills necessary to develop, validate and administer both qualitative and quantitative measures and instruments. Topics will include creating valid measures, ensuring the measures used address and apply to the research questions, design and samples; determining when to use standardized measures or develop new ones; instrument validation techniques; factor analysis; and survey administration, including determining the most effective way of administering measures (e.g., online, paper-and-pencil, ACASI) and the best way to design the survey.

HRP 245. Intensive Course in Clinical Research. 2 Units.
The Intensive Course in Clinical Research (ICCR) is a one-week immersion course designed for new or aspiring clinical investigators, medical students, residents, graduate students, fellows and junior faculty interested in pursuing careers in clinical and translational research. Students spend five days and four evenings immersed in all aspects of research study design and performance. The format combined didactic with intense group/team activities focused on practical issues in clinical research design - from selection of a researchable study question through actual writing of a research proposal. Lectures and panel discussions are presented by an accomplished faculty of Stanford clinical researchers and key leaders from the Stanford community. Every presentation includes a discussion of relevant issues. The course is supported by over 40 faculty and fellows from across the School of Medicine.
HRP 246. Seminar in Healthcare Quality and Safety. 1 Unit.
Primarily for medical students in the Quality and Safety Scholarly Concentration. Almost everyone will be a patient at some point in their lives. It is estimated that over 98,000 patients die in US hospitals each year due to medical errors and recent articles suggest that medical errors are the third leading cause of death in the US. Patient safety is the foundation of high-quality health care, which has become a critical issue in health policy discussions. This course will provide an overview of the quality & patient safety movement, the array of measurement techniques and issues, and perspectives of quality improvement efforts under the current policy landscape. Lunch will be provided for enrolled students. Same as: BIOMEDIN 246

HRP 247. Epidemiology: How to Identify, Investigate and Interrupt Outbreaks of Disease. 4 Units.
We will cover: the components of public health systems in the US; principles of outbreak investigation and disease surveillance; different types of study design for field investigation; visualization and interpretation of public health data, including identification and prevention of biases; and implementation of disease control by public health authorities. Students will meet with leaders of health departments of the state and the county and will be responsible for devising, testing and evaluating a field questionnaire to better understand the complexities of field research. HUMBIO students must enroll in HUMBIO 57. HRP students must enroll in HRP 247. Same as: HUMBIO 57

HRP 249. Topics in Health Economics I. 2-5 Units.
Course will cover various topics in health economics, from theoretical and empirical perspectives. Topics will include public financing and public policy in health care and health insurance; demand and supply of health insurance and healthcare; physicians' incentives; patient decision-making; competition policy in healthcare markets, intellectual property in the context of pharmaceutical drugs and medical technology; other aspects of interaction between public and private sectors in healthcare and health insurance markets. Key emphasis on recent work and empirical methods and modelling. Prerequisites: Micro and Econometrics first year sequences (or equivalent). Curricular prerequisites (if applicable): First year graduate Microeconomics and Econometrics sequences (or equivalent). Same as: ECON 249, MED 249

HRP 250. Understanding Evidence-Based Medicine: Hands-on experience. 3 Units.
How can one practice Evidence Based Medicine (EBM) and make evidence-based decisions for clinical practice and policy making? In this course we will teach the principles of EBM using examples from pivotal papers published in recent scientific literature in major journals addressing important clinical questions on diverse medical topics. We will probe a wide range of types of studies, targeted therapeutic or preventive interventions, and studies outcomes, including randomized controlled trials, observational studies, epidemiologic surveillance studies, systematic reviews, meta-analyses, meta-analyses of individual patient data, studies on the evaluation of diagnostic test and prognostic models, economic analyses studies, and guidelines. MD students enroll for +/- GR students enroll for Letter grade. Same as: CHPR 205, MED 250

HRP 251. Design and Conduct of Clinical Trials. 3 Units.
The rationale for phases 1-3 clinical trials, the recruitment of subjects, techniques for randomization, data collection and endpoints, interim monitoring, and reporting of results. Emphasis is on the theoretical underpinnings of clinical research and the practical aspects of conducting clinical trials.

HRP 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, MED 252

HRP 253. Cancer Epidemiology and Prevention. 3 Units.
This course focuses on the role of epidemiology in cancer etiology, prevention, and control. We will discuss descriptive epidemiology, including cancer trends and patterns, natural history, and biologic characteristics as well as etiology of selected cancers. the influence of environmental and genetic factors and their interplay on the development of cancer are discussed as well as methodologic issues related to investigations of these studies. Principles and problems involved in cancer prevention and screening are covered. Student evaluation is based on a brief presentation and a paper on the descriptive epidemiology of a selected cancer, and participation in class discussions.

HRP 256. Economics of Health and Medical Care. 5 Units.
Institutional, theoretical, and empirical analysis of the problems of health and medical care. Topics: demand for medical care and medical insurance; institutions in the health sector; economics of information applied to the market for health insurance and for health care; measurement and valuation of health; competition in health care delivery. Graduate students with research interests should take ECON 249. Prerequisites: ECON 50 and either ECON 102A or STATS 116 or the equivalent. Recommended: ECON 51. Same as: BIOMEDIN 156, BIOMEDIN 256, ECON 126

HRP 257. Advanced Topics in the Economics of Health and Medical Care. 2 Units.
Emphasis is on research studies in health economics. Seminar style course focuses on health economics. Complimentary with HRP 256. Students will be expected to read and present papers to the group and discuss concepts with faculty. Restricted to second year or beyond PhD students in economics & economics-related disciplines. Same as: MED 265

HRP 258. Introduction to Probability and Statistics for Clinical Research. 3 Units.
Open to medical and graduate students; required of medical students in the Clinical Research Scholarly Concentration. Tools to evaluate medical literature. Topics include random variables, expectation, variance, probability distributions, the central limit theorem, sampling theory, hypothesis testing, confidence intervals, correlation, regression, analysis of variance, and survival analysis.

HRP 259. Introduction to Probability and Statistics for Epidemiology. 3 Units.
Topics: random variables, expectation, variance, probability distributions, the central limit theorem, sampling theory, hypothesis testing, confidence intervals. Correlation, regression, analysis of variance, and nonparametric tests. Introduction to least squares and maximum likelihood estimation. Emphasis is on medical applications.

HRP 261. Intermediate Biostatistics: Analysis of Discrete Data. 3 Units.
Methods for analyzing data from case-control and cross-sectional studies: the 2x2 table, chi-square test, Fisher’s exact test, odds ratios, Mantel-Haenzel methods, stratification, tests for matched data, logistic regression, conditional logistic regression. Emphasis is on data analysis in SAS. Special topics: cross-fold validation and bootstrap inference. Same as: BIOMEDIN 233, STATS 261
HRP 262. Intermediate Biostatistics: Regression, Prediction, Survival Analysis. 3 Units.
Methods for analyzing longitudinal data. Topics include Kaplan-Meier methods, Cox regression, hazard ratios, time-dependent variables, longitudinal data structures, profile plots, missing data, modeling change, MANOVA, repeated-measures ANOVA, GEE, and mixed models. Emphasis is on practical applications. Prerequisites: basic ANOVA and linear regression.
Same as: STATS 262

HRP 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: MED 263

HRP 264. Foundations of Statistical and Scientific Inference. 1 Unit.
The course will consist of readings and discussion of foundational papers and book sections in the domains of statistical and scientific inference. Topics to be covered include philosophy of science, interpretations of probability, Bayesian and frequentist approaches to statistical inference and current controversies about the proper use of p-values and research reproducibility. nRecommended preparation: At least 2 quarters of biostatistics and one of epidemiology. Intended for second year Masters students, of PhD students with at least 1 year of preceding graduate training.
Same as: STATS 264

HRP 265. Advanced Methods for Meta-Analysis. 2 Units.
Meta-analysis is a method to quantitatively combine information from multiple studies; this combination is also called "research synthesis." Historically, it has been used to combine studies with a similar design, such as randomized controlled trials or observational studies examining similar interventions or exposures. However, evidence about a given relationship is often provided by many studies with different designs, or studies that can be "fit together" to create an evidence base. This can only be done with advanced meta-analytic methods. The course will cover advanced methods for research synthesis, including multivariate meta-analysis for multiple outcomes, generalized evidence synthesis of multiple study designs, and network meta-analysis for multiple interventions. These techniques are being increasingly used in evidence-based medicine, health technology assessments and policy making.
Recommended preparation: HRP 206, and at least 2 quarters of biostatistics and one of epidemiology, including clinical research design. Familiarity with logistic and linear regression modeling required.

HRP 267. Life Course Epidemiology. 2 Units.
The focus of this course is on understanding the evidence for how exposure at multiple levels and at multiple ages influences an individual's health at any given time. The course emphasizes the primary theories used to examine life course determinants of health and how these theories both facilitate and impede research. A secondary focus is on understanding the methodological challenges to studying health from a life course perspective, as well as how knowledge of life course determinants of health can inform interventions to improve health from a population perspective.

HRP 271. Preparation and Practice: Scientific Communication and Media. 1-2 Unit.
Through tailored lecture, case study, and a practical final project, academic and professional leaders will help you gain insight into the science communications and media industry and the skills necessary to succeed within the various positions and levels available within it.
Anticipated Learning Outcomes:
1) To assist interdisciplinary graduate students, medical students, residents and fellows in all levels of training to develop and hone the communication skills necessary for post-training and internship success in a science communications/media field;
2) To provide an understanding of the scope of career opportunities within the science communications sector, focusing on the development, organization, and management issues specific to it;
3) To provide a forum for interacting with alumni, faculty, and other practitioners from a variety of fields and organizations who may assist candidates with defining and meeting their own professional goals;
4) To increase awareness of industry terminology and theories, combined with hands-on experience with techniques and methodologies most useful for credential development on the job market;
5) To develop and hone expertise in the areas of publishing, editing, workflow, ethics, trends, principles of effective scholarly/news writing, interviewing techniques, and media/website management.

HRP 272. The Science of Community Engagement in Health Research. 3 Units.
The Science of Community Engagement in Health Research course will focus on how the science of community engagement can be applied to diverse health-related research topics across the translational spectrum with the ultimate goal of high quality research that transforms human health and addresses health disparities. The course will provide historical context, theoretical frameworks, foundational skills in diverse community engagement methodologies, and tools for examining the effectiveness of various engagement strategies aimed. Specifically, the course will cover:
1) Historical context for community engagement in health-related research;
2) Evolution of community engagement as a science;
3) Theoretical frameworks for various community engagement approaches;
4) Community-Based Participatory Research (CBPR);
5) Community engagement strategies for different stages of translational research; and
6) Evaluation of various engagement strategies; and
7) Ethics of community engagement. Students will gain practical experience in various community engagement tools and strategies to help guide the development of a community engagement plan responsive to community needs. Challenges and benefits of establishing community partnerships will be highlighted by real-world examples. nThe course will include lectures, interactive student-led presentations and guided exercises; class discussions among invited speakers, students and instructors; individual and group assignments; and organized small-group and experiential activities. Course readings will demonstrate the need and opportunity for interdisciplinary community engagement approaches and will illustrate how to conduct innovative community-engaged research.
The Science of Community Engagement course is intended to reach students with diverse research interests, including clinical research, community health, health research and policy, epidemiology, prevention research, environmental health, etc.
Same as: CHPR 227

HRP 273. Essentials of Clinical Research at Stanford. 1 Unit.
The course will consist of an introduction to the fundamentals of clinical research at Stanford, including the science of clinical research (design and analysis) and logistics (GCP data management, regulatory). Material will be covered in approximately 4-6 3 hour sessions per quarter.
HRP 275. Population Health Research. 3 Units.
This course provides hands-on experience for students wishing to undertake health-related research using registry data covering the population of Denmark. Students will be instructed in basic R programming, which they will use to analyze anonymized Danish data (prior experience with R not required). Students will become familiar with the Danish data and develop a detailed original research proposal on a health-related topic addressable within the Danish data. Most students should be able to complete their proposed research in independent studies after successful completion of this course. nPrerequisites: HRP 259 or comparable introductory course in statistics. Special permission from the instructor required without prerequisites.

HRP 280. Spanish for Medical Students. 2 Units.
First quarter of three-quarter series. Goal is a practical and culturally appropriate command of spoken Spanish. Emphasis is on taking the medical history. Topics include anatomy, general hospital procedures, pediatrics, nutrition, and essential doctor-patient phrases when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge. Undergraduates are welcome to enroll.
Same as: SPANLANG 121M

HRP 281. Spanish for Medical Students. 2 Units.
Second quarter of three-quarter series. Goal is a practical and culturally appropriate command of spoken Spanish. Emphasis is on performing a physical examination. Topics include anatomy, general hospital procedures, reproductive health, emergency medicine, and essential doctor-patient phrases when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge. Undergraduates are welcome to enroll.
Same as: SPANLANG 122M

HRP 282. Spanish for Medical Students. 2 Units.
Third quarter of three-quarter series. Goal is a practical and culturally appropriate command of spoken Spanish. Emphasis is on different specialties and medical conditions. Topics include anatomy, diagnostic procedures, HIV, diabetes, hypertension, and essential doctor-patient phrases when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge. Undergraduates are welcome to enroll.
Same as: SPANLANG 123M

HRP 283. Health Services Research Core Seminar. 1 Unit.
Presentation of research in progress and tutorials in the field of health services research.

Are you interested in innovative ideas and strategies for addressing urgent challenges in human and planetary health? This lecture series features a selection of noteworthy leaders, innovators and experts across diverse sectors such as: healthcare/medical innovation, foundations/venture capital, biotechnology/ pharmaceuticals, social innovation/entrepreneurship health, tech/media and artificial intelligence (AI), human rights, global poverty/development, sustainable agriculture/hunger/nutrition. Co-convened by faculty, fellows and students collaborating across several Stanford centers, the course invites the discussion of global problems, perspectives and solutions in the fields of health and the environment. Light Dinner will be served. Students from all backgrounds are encouraged to enroll - registration open to all Stanford students and fellows. May be repeated for credit.
Same as: MED 285

HRP 290. Advanced Medical Spanish. 2 Units.
Enrollment limited to medical students. Designed to further develop linguistic skills, covering all medical specialties according to student needs. Sessions also include topics on patient education and diseases, such as diabetes, asthma, TB, and CVDs.

HRP 291. Curricular Practical Training. 1-18 Unit.
Curricular Practical Training in HRP.

HRP 292. Advanced Statistical Methods for Observational Studies. 2-3 Units.
Design principles and statistical methods for observational studies. Topics include: matching methods, sensitivity analysis, and instrumental variables. 3 unit registration requires a small project and presentation. Prequisites: HRP 261 and 262 in STATS 209 (HRP 239), or equivalent. See http://rogosateaching.com/somgen290/.
Same as: CHPR 266, EDUC 260B, STATS 266

HRP 295. Advanced Topics in Epidemiologic and Clinical Research. 2 Units.
Topics include alternative study designs, causal inference methods, instrumental variables, time-varying confounding, registry-based research, missing data, and repeated events. Weekly readings and discussions will consider how these methods apply to numerous substantive areas including pharmacoeconomics, reproductive and perinatal epidemiology, and many areas of chronic disease epidemiology. Prerequisite: HRP 225 and HRP 226 or permission of instructor.

HRP 299. Directed Reading in Health Research and Policy. 1-18 Unit.
Epidemiology, health services research, preventive medicine, medical genetics, public health, economics of medical care, occupational or environmental medicine, international health, or related fields. May be repeated for credit. Prerequisite: consent of instructor.

HRP 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.

HRP 391. Health Law: Finance and Insurance. 3 Units.
(SAME AS LAW 3001, MGTECON 331) This course provides the legal, institutional, and economic background necessary to understand the financing and production of health services in the U.S. We will discuss the Affordable Care Act, health insurance (Medicare and Medicaid, employer-sponsored insurance, the uninsured), the approval process and IP protection for pharmaceuticals, and antitrust policy. We may discuss obesity and wellness, regulation of fraud and abuse, and medical malpractice. The syllabus for this course can be found at https://syllabus.stanford.edu. Elements used in grading: Participation, attendance, class presentation, and final exam.
Same as: PUBLPOL 231

HRP 392. Analysis of Costs, Risks, and Benefits of Health Care. 4 Units.
For graduate students. How to do cost/benefit analysis when the output is difficult or impossible to measure. Literature on the principles of cost/benefit analysis applied to health care. Critical review of actual studies. Emphasis is on the art of practical application.
Same as: BIOMEDIN 432

HRP 399. Graduate Research. 1-18 Unit.
Investigations sponsored by individual faculty members. Prerequisite: consent of instructor.

HRP 800. Second Year Health Policy PHD Tutorial. 1-3 Unit.
The goal of the second year tutorial is to provide PHD students with advanced training in health policy research and to assist them in successfully developing research proposals.

HRP 801. TGR Project. 0 Units.

HRP 802. TGR Dissertation. 0 Units.

HRP 89Q. Introduction to Cross Cultural Issues in Medicine. 3 Units.
Preference to sophomores. Introduction to social factors that impact health care delivery, such as ethnicity, immigration, language barriers, and patient service expectations. Focus is on developing a framework to understand culturally unique and non-English speaking populations in the health care system.