Human Biology


The program offers a Bachelor of Arts in Human Biology (http://www.stanford.edu/dept/registrar/bulletin/5917.htm), as well as a minor and an honors program.

Mission of the Undergraduate Program in Human Biology

The mission of the undergraduate program in Human Biology is to provide students with an interdisciplinary approach to understanding human beings from biological, behavioral, social, and cultural perspectives. Courses in the major allow students to see connections and parallels with other fields as they learn to formulate and evaluate health, environmental, and other public policy issues that influence human welfare. The program prepares majors to pursue advanced training in professional or graduate programs.

To achieve these goals, all students complete a 30-unit core sequence, normally in the sophomore year, which provides the foundation for the major. Also during the sophomore year, students consult with student advisers to choose a faculty adviser and complete the declaration process. Together they plan a road map of course work designed to help each student focus on an area of interest within Human Biology. Early Planning and subsequent refining of an individualized course of study, in consultation with student and faculty advisers, is a strength and requirement of the program. The curriculum draws on faculty from across the University. To complete a B.A. in Human Biology, students must take courses from within the program and from other University departments. Most Human Biology majors go on to advanced training in professional schools, or graduate programs in the behavioral, natural, and social sciences, including coterminous master's degree programs in other University departments. Additional information about the major may be obtained from the program’s offices or at the Program in Human Biology (http://humbio.stanford.edu) web site.

Learning Outcomes (Undergraduate)

The program expects its undergraduate majors to be able to demonstrate the following learning outcomes. These learning outcomes are used in evaluating students and the Program in Human Biology. Students are expected to demonstrate:

1. ability to acquire and synthesize scientific information from a variety of sources.
2. ability to apply analytical tools to evaluate policy.
3. ability to interpret knowledge in meaningful and appropriate ways as they draw conclusions about the significance of their findings.
4. ability to communicate their scientific ideas clearly and persuasively.

Student Advisers

Human Biology has an advising program comprising faculty and student advisers. Before declaring Human Biology as the undergraduate major, each student must meet with one of six student advisers who assist in developing a coherent study plan based on an individualized area of concentration, and the selection of foundation, concentration, and upper-division courses. The student advisers also assist students in selecting an appropriate faculty adviser and a suitable internship for their area of concentration and career goals. Student advisers offer drop-in services during scheduled office hours every weekday and some evenings. The student advisers also sponsor events including the Internship Faire, Beyond HumBio, and declaration workshops. To maintain high standards of advising that respond to the needs of individual students, student advisers meet weekly with the program’s faculty advising chairs and the student services coordinator to review the program’s policies and specific student inquiries and petitions concerning the program.

Storey House

Storey House, 544 Lasuen Mall, is an undergraduate resident theme house for Human Biology, devoted to developing an intellectual community among Human Biology majors at Stanford, and allowing faculty and students to become acquainted and share their Human Biology interests and research. Its goals are to foster intellectual discussion in the residential lives of the students living in Storey House, mentoring relationships between upperclassmen and core students in the house, and stimulating events for all Human Biology majors facilitated by academic theme associates. Assignment is made through the regular undergraduate housing draw.

Bachelor of Arts in Human Biology

Declaring the Major

A prospective major must consult with the student and faculty advisers to obtain detailed information about the program and guidance in the development of an individual course of study.

At the time the major is declared, the student must submit a written statement (3-5 pages) of academic and long-term goals and the proposed list of courses satisfying the requirements for the major. The proposal is then reviewed by the student advisers who help identify an appropriate faculty adviser. Final approval of the proposed course of study rests with the faculty adviser.

It is important to declare early, preferably in early spring as soon as students have passed both Autumn and Winter Quarter core courses (HUMBIO 2A Genetics, Evolution, and Ecology, HUMBIO 2B Culture, Evolution, and Society, HUMBIO 3A Cell and Developmental Biology, HUMBIO 3B Behavior, Health, and Development). The University requires students to declare a major by the end of Spring Quarter of the sophomore year. Under special circumstances students may declare as late as Autumn Quarter of the junior year. Petitions to declare late require additional documentation and are less likely to be approved.

Students who plan to pursue graduate work should be aware of the admission requirements of the schools to which they intend to apply. Early planning is advisable to guarantee completion of major and graduate school requirements.

Degree Requirements

The B.A. in Human Biology (HUMBIO) requires a minimum of 87 units in the major divided among four levels of courses:

1. Fundamental Program: at least 38 units, to include
   a. Human Biology Core (30 units); see "Human Biology Core" below for more information. The Human Biology Core refers to:

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<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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<tr>
<td>HUMBIO 2A</td>
<td>Genetics, Evolution, and Ecology</td>
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<td>HUMBIO 2B</td>
<td>Culture, Evolution, and Society</td>
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HUMBIO 3A Cell and Developmental Biology 5
HUMBIO 3B Behavior, Health, and Development 5
HUMBIO 4A The Human Organism 5
HUMBIO 4B Environmental and Health Policy Analysis 5

b. Statistics (3-5 units). The core and statistics courses must be taken for a letter grade by majors. The minimum grade requirement is ‘C-’. (Note: Students who are not declared before Monday, September 21, 2015, may not use STATS 60 to fulfill the statistics requirement.) Statistics may be chosen from courses such as:

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<th>Course</th>
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<tr>
<td>BIO 141</td>
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<td>CS 109</td>
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<tr>
<td>ECON 102A</td>
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<td>EDUC 200C</td>
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<tr>
<td>HUMBIO 85A</td>
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<td>HUMBIO 88</td>
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<td>HUMBIO 89</td>
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<td>SOC 181B</td>
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2. Foundation Courses: 20-unit minimum. Total units vary, depending on the focus of study chosen by the student for the area of concentration. They may include introductory-level courses from across the University and lab courses. The minimum grade requirement for foundation courses is ‘C-’.

3. Area of Concentration: a minimum of five courses totaling at least 20 units. This in-depth area of study enables the student to focus on educational and post-baccalaureate goals. Courses are non-introductory, theory-based, and are usually numbered over 100. Three or more departments must be represented in the concentration. Each course must be taken for a minimum of 3 units. The area of concentration is individually designed by the student in consultation with the student advisers and faculty adviser. Final approval of the concentration rests with the student advisers and faculty adviser. All area of concentration courses must be taken for a letter grade. The minimum grade requirement for area of concentration courses is ‘C-’. The area of concentration generally has an emphasis in one, and sometimes more than one, of the following eight areas:

Area 1: Environment and Environmental Policy
- Environment
- Environmental Policy
- Culture/Demography/Human Ecology

Area 2: Health and Health Policy
- Health Policy
- Public Health
- International Health

Area 3: Human Performance

Area 4: Human Development
- Biological Development
- Psychological Development
- Education

Area 5: Biomedical Science

Area 2: Health and Health Policy
- Genetics
- Molecular Biology
- Human Physiology
- Infectious Diseases

Area 3: Human Performance
- Education
- Psychological Development
- Education

Area 4: Human Development
- Biological Development
- Psychological Development
- Education

Area 5: Biomedical Science

Area 6: Brain and Behavior

Area 7: Ethics and Medical Humanities

Area 8: Evolution

A non-exclusive list of possible courses for each emphasis is available at the student advisers’ office or at the Area of Concentration Course List (https://humbio.stanford.edu/courses/aoc) web site.

4. Upper-Division Courses: students must take three Human Biology upper-division courses numbered 100 to 189. These courses should be used to explore subjects outside the area of concentration. One upper-division course may be taken satisfactory/no credit. Each course must be taken for a minimum of 3 units. Minimum grade requirement for Upper Division courses is ‘C-’. All non-laboratory advanced HUMBIO courses (those numbered 100 to 189) fulfill the Human Biology upper-division requirement. A list of Human Biology overseas courses can be found at the Related Courses (http://www.stanford.edu/dept/humbio/cgi-bin/?q=node/1382) web site.

Human Biology Core

Required core sequences (HUMBIO 2A Genetics, Evolution, and Ecology, HUMBIO 2B Culture, Evolution, and Society, HUMBIO 3A Cell and Developmental Biology, HUMBIO 3B Behavior, Health, and Development, and HUMBIO 4A The Human Organism, HUMBIO 4B Environmental and Health Policy Analysis) introduce the biological and social sciences, and most importantly, relationships between the two. Classes meet throughout the academic year. Students must register concurrently for the A and B series. Students should initiate the core in Autumn Quarter of the sophomore year. Freshmen are not permitted to enroll. Majors must earn a minimum letter grade of ‘C-’ in core courses. The Human Biology core consists of the following courses:

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<tr>
<td>HUMBIO 2A</td>
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<td>HUMBIO 3A</td>
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<td>HUMBIO 4A</td>
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<td>HUMBIO 4B</td>
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Honors Program

The honors program in Human Biology provides qualified majors the opportunity to work closely with faculty on an individual research project, culminating in an honors thesis. Students may begin honors research from a number of starting points including topics introduced in the core or upper-division courses; independent interests stemming from an internship experience; or collaborating with faculty from the natural, social, or behavioral sciences.

Students may apply to the honors program if they have completed the Human Biology core with a minimum GPA of 3.0, have an overall Stanford GPA of 3.2, and meet other requirements detailed in the honors handbook. Interested students should consult the Human Biology Honors Handbook (https://humbio.stanford.edu/node/152) and meet with the Human Biology Associate Director or student services officer.

Most honors projects involve a total of 10-15 units of course work in HUMBIO 193 and 194:
Minor in Human Biology

A minor in Human Biology provides an introductory background to the relationship between the biological and social aspects of humanity's origin, development, and prospects. Many of the major problems facing human civilization today involve both biological and social aspects. Scientific approaches to these problems are essential, but they must be broadly conceived, integrating what is known of the biological with an understanding of the social and cultural setting in which they exist. Students with a minor in Human Biology are expected to develop a strong background in the integration between the biological and social aspects of human beings.

Students declaring a minor in Human Biology must do so no later than two quarters prior to their intended quarter of degree conferral (for example, a student must declare a minor before the end of Autumn Quarter to graduate the following Spring Quarter).

To minor in Human Biology, students must take the Human Biology Core:

- **HUMBIO 2A Genetics, Evolution, and Ecology**
- **HUMBIO 2B Culture, Evolution, and Society**
- **HUMBIO 3A Cell and Developmental Biology**
- **HUMBIO 3B Behavior, Health, and Development**
- **HUMBIO 4A The Human Organism**
- **HUMBIO 4B Environmental and Health Policy Analysis**
- and one additional upper-division course (for example, any HUMBIO course numbered 100-189).

The student must earn a minimum letter grade of 'C-'. Courses that count towards the fulfillment of major requirements may not be counted towards the minor.

Emeriti: (Professors) Doug Brutlag (Biochemistry), Carl Djerassi (Chemistry), Sanford Dornbusch (Sociology), Stanley Falkow (Microbiology/Immunology), A. Dale Kaiser (Biochemistry), Herant Katchadourian (Human Biology), Donald Kennedy (Biology), Ellen FitzSimmons Porzig (Developmental Biology), Carol Winograd (Medicine)

Director: Paul Fisher (Neurology)

Associate Director: Katherine Preston

Professors: Laurence Baker (Health Research and Policy), Ben Barres (Neurobiology), Donna Bouley (Comparative Medicine), Martha Cyert (Biology), William H. Durham (Anthropology), Heidi Feldman (Pediatrics: Neonatology), Dean Felscher (Medicine: Oncology), Russell D. Fernald (Biology), Paul Fisher (Neurology), Margaret Fuller (Developmental Biology), Garry Gold (Diagnostic Radiology), Lawrence H. Gould (Economics), James J.Gross (Psychology), H. Craig Heller (Biology), Jill Helms (Surgery), Paula Hillard (Obstetrics and Gynecology), Patricia P. Jones (Biology), Richard Klein (Anthropology), Joseph S. Lipsick (Pathology), Tanya Luhrmann (Anthropology), Sean Mackey (Anesthesiology), Yvonne Maldonado (Pediatrics: Infectious Diseases), Michael Marmor (Ophthalmology), Gordon Matheson (Orthopaedic Surgery), Jose Montoya (Infectious Diseases), Rosamond Naylor (Environmental Earth System Science), Robert Negrin (Medicine: Blood and Marrow Transplantation), Roeland Nusse (Developmental Biology), Julie Parsonnet (Medicine: Infectious Diseases), Allan Reiss (Interdisciplinary Brain Science Research), Thomas Robinson (Pediatrics), Robert Sapolsky (Biology), Walter Scheidel (Classics), Kenneth Schultz (Political Science), Matthew Scott (Developmental Biology), Randall Stafford (Stanford Prevention Research Center), William Talbot (Developmental Biology), Lucy Tompkins (Infectious Diseases), Shirpid Tulajpaurkar (Biology), Anthony Wagner (Psychology), Jeffrey Wine (Psychology), Paul Wise (Pediatrics), Arthur P. Wolf (Anthropological Sciences)

Associate Professors: Jayanta Bhattacharya (Medicine/SCBE), M. Kate Bundorf (Health Research and Policy), Firdaus Dhabhar (Psychiatry and Behavioral Sciences), Anne Fernald (Psychology), Brenda Goliari (Anesthesiology), Joachim Hallmayer (Psychiatric and Behavioral Sciences - Child and Adolescent Psychiatry and Child Development), James Jones (Anthropology), Peter Kao (Med/Pulmonary and Critical Care Medicine), Brian Knutson (Psychology), Norman G. Miller (Medicine/SCBE), Denise Monack (Microbiology and Immunology), Rob Reich (Political Science), John Rick (Anthropology), Matthew Smith (German)

Assistant Professors: Sanjay Basu (Medicine: Stanford Prevention Research Center), Eran Bendavid (General Internal Medicine), Jeremy Goldhaber-Fiebert (Medicine/SCBE), Samuel McClure (Psychology), Michelle Monje-Deisseroth (Neurology), Jelena Obradovic (Education), Jamie Zeitzer (Psychiatry and Behavioral Sciences)

Professor (Research): Christopher Gardner (Stanford Prevention Research Center), David Lyons (Psychiatry and Behavioral Sciences), Marcia Stefanick (Stanford Prevention Research Center)

Assistant Professors (Research): Karen Parker (Psychiatry and Behavioral Sciences)

Professors (Teaching): Donald Barr (Pediatrics), David Magnus (Pediatrics/SCBE), Robert Siegel (Microbiology and Immunology)

Associate Professors (Teaching): Catherine Heaney (Psychology), Lianne Kurina (Med/General Internal Medicine), Eunique Rodriguez (Pediatrics), Kristin Sainani (Health Research and Policy – Epidemiology)

Clinical Associate Professors: Mary Therese Jacobson (Obstetrics and Gynecology), Daryn Reichert (Psychiatry and Behavioral Sciences), Katherine Williams (Psychiatry and Behavioral Sciences)

Clinical Assistant Professors: Cynthia Nguyen (Psychiatry and Behavioral Sciences), Rita Popat (Health Research and Policy, Epidemiology)

Senior Research Scholar: Wesley F. Alles (Med/HP/BeWell)

Other Teaching Faculty and Staff: William Abrams, Maya Adam (Pediatrics - Infectious Diseases), Aaron Bernstein, Judy Chu, Sophia Colamarino (Psychiatry and Behavioral Sciences), Anne Firth-Murray, Anne Friedlander, Ronald Garcia (Center for Excellence), Renu Heller (Biology), Lisa Medoff, Joe Nation (Public Policy), Katherine Preston, Lisa Goldman Rosas (Medicine: Stanford Prevention Research Center), Annette Salmeen, Darvin Scott Smith (Microbiology and Immunology), Jennifer Wolf (Education), Nathan Wolfe, Lawrence Zaroff (Anesthesiology and Biomedical Ethics)

Course Associates: Anne Marie Barber, Hanna Burch, Talon Clayton, Olivia Jew, Sabrina Layne, Ali Maggioncalda, Ruth Marks, Rachel Pedreira

Honor Chair: Katherine Preston
Overseas Studies Courses in Human Biology

The Bing Overseas Studies Program (http://bosp.stanford.edu) manages Stanford study abroad programs for Stanford undergraduates. Students should consult their department or program's student services office for applicability of Overseas Studies courses to a major or minor program.

The Bing Overseas Studies course search site (https://undergrad.stanford.edu/programs/bosp/explore/search-courses) displays courses, locations, and quarters relevant to specific majors.

For course descriptions and additional offerings, see the listings in the Stanford Bulletin’s ExploreCourses (http://explorecourses.stanford.edu) or Bing Overseas Studies (http://bosp.stanford.edu).

Courses

HUMBIO 2A. Genetics, Evolution, and Ecology. 5 Units.
Introduction to the principles of classical and modern genetics, evolutionary theory, and population biology. Topics: micro- and macro-evolution, population and molecular genetics, biodiversity, and ecology, emphasizing the genetics and ecology of the evolutionary process and applications to human populations. HUMBIO 2A and 2B must be taken concurrently.

HUMBIO 2B. Culture, Evolution, and Society. 5 Units.
Introduction to the evolutionary study of human diversity. Hominid evolution, the origins of social complexity, social theory, and the emergence of the modern world system, emphasizing the concept of culture and its influence on human differences. HUMBIO 2A and 2B must be taken concurrently.

HUMBIO 3A. Cell and Developmental Biology. 5 Units.
The principles of the biology of cells: principles of human developmental biology, biochemistry of energetics and metabolism, the nature of membranes and organelles, hormone action and signal transduction in normal and diseased states (diabetes, cancer, autoimmune diseases), drug discovery, immunity, and drug addiction. HUMBIO 3A and 3B must be taken concurrently. Prerequisite: college chemistry or completion of the HumBio chemistry lecture series during the fall quarter.

HUMBIO 3B. Behavior, Health, and Development. 5 Units.
Research and theory on human behavior, health, and life span development. How biological factors and cultural practices influence cognition, emotion, motivation, personality, and health in childhood, adolescence, and adulthood. HUMBIO 3A and 3B must be taken concurrently.

HUMBIO 3Y. Practicum in Child Development. 1 Unit.
Practicum experience at Bing Nursery School for 1 1/4 hours of observation per week, class meeting every other week for 1 hour. Pre- or corequisite: 3B.

HUMBIO 4A. The Human Organism. 5 Units.
Organ system physiology: the principles of neurobiology and endocrinology, and the functions of body organs. The mechanisms of control, regulation, and integration of organ systems function. HUMBIO 4A and 4B must be taken concurrently.

HUMBIO 4B. Environmental and Health Policy Analysis. 5 Units.
Connections among the life sciences, social sciences, public health, and public policy. The economic, social, and institutional factors that underlie environmental degradation, the incidence of disease, and inequalities in health status and access to health care. Public policies to address these problems. Topics include pollution regulation, climate change policy, biodiversity protection, health care reform, health disparities, and women's health policy. HUMBIO 4A and 4B must be taken concurrently.

HUMBIO 5E. Science Education in Human Biology. 1 Unit.
In this seminar, students will become familiar with current research on science education. They will use this knowledge to create and analyze teaching material such as section plans, exams, and problem sets. Material produced in this course will be related to the topics covered in the core course of the Program in Human Biology. Students will experience and practice various teaching styles. Prerequisite: HumBio Core or equivalent.

HUMBIO 6. Human Origins. 5 Units.
The human fossil record from the first non-human primates in the late Cretaceous or early Paleocene, 80-65 million years ago, to the anatomically modern people in the late Pleistocene, between 100,000 to 50,000 B.C.E. Emphasis is on broad evolutionary trends and the natural selective forces behind them.

Same as: ANTHRO 6, ANTHRO 206

HUMBIO 11SI. Health and Wellness for Generation Y: A post-college Survival. 1 Unit.
After living in the Stanford Bubble for 4 years, the thought of the rest of our lives can be a bit daunting. This 10-week seminar will cover key topics for a successful transition into the "real world" such as personal finance, health and nutrition, relationships, careers, and mindfulness, all through the interdisciplinary lens of Human Biology.

HUMBIO 12SI. The Right to Health: Frameworks for Advocacy and Action. 1 Unit.
Interactive dialogue on the right to health, beginning with general frameworks on human rights instruments and then applying them to case studies of global health disparities. Features weekly guest lectures by experts in global health, health policy, and human rights. Topics include: global health governance, maternal and child health, and global mental health. Students will use lectures and dialogues as frameworks for their own advocacy projects. Classes will be held in the Arrillaga Study Room.
HUMBIO 16SC. The Stanford Safari: Field Observations in Our Own Backyard. 2 Units.
Although Stanford is renowned as a place of learning and research, the goal of this class is to approach Stanford University as a subject worthy of study in and of itself. Students will study Stanford in terms of the built environment (e.g. architecture; how buildings and styles interact; how the landscape shapes the flow of people, plants, and animals), the human interactions (e.g. sociology of tourism, the politics of land use), and the ecology (flora, fauna, geology, climatology, and pest control) of campus. The students in this course will defamiliarize themselves with their campus environment and approach Stanford with new eyes—the eyes of the anthropologist, the photographer, the historian, the artist, and the tourist. We will explore its edifices, gardens, sculptures, open spaces, and commercial areas. Moreover, we will use Stanford as a lens to discuss a variety of disciplines: architecture, educational theory, California history, climatology, and natural history. But more than anything, we will focus on the human component, including the vision, drive, and serendipity that shaped the University. Taking the course students will hone their skills in field observation that will carry over to future field work in more distant locales, develop an interdisciplinary approach to analyzing complex institutions, and gain a deeper appreciation for the complexity and richness of Stanford that will enhance all aspects of their remaining time as undergraduates. On a daily basis, the class will consist of three components: class presentations and discussions, formal and informal talks by many of the local experts at Stanford, and topical field trips. Students will select a theme that is of personal interest and develop field observation techniques useful for their particular topics. Course assignments will be to give two presentations on specific aspects of Stanford. In addition, each student will keep a field notebook with daily observations and field notes, post a collection of photographic observations, and complete pertinent readings. Plan to work intensely and have a great time in the process.

HUMBIO 17SC. Darwin, Evolution, and Galapagos. 2 Units.
The tiny remote islands of Galapagos have played a large and central role in the study of evolution. Not surprisingly, they have also been central to the study of conservation. The fascinating adaptations of organisms to the unique ecosystems of the archipelago have left them particularly vulnerable to outside introductions. This seminar explores evolution, conservation, and their connection in the Galapagos. Using case-study material on finches, iguanas, tortoises, cacti, Scalesia plants, and more, we will explore current theory and debate about adaptation, sexual selection, speciation, adaptive radiation, and other topics in evolution. Similarly, we will explore the special challenges Galapagos poses today for conservation, owing to both its unusual biota and the increasing human impact on the archipelago. The first week is held on-campus, followed by an intensive eleven-day expedition to Galapagos to observe firsthand evolutionary phenomena and conservation issues. A chartered ship will serve as our floating classroom, dormitory, and dining hall as we work our way around the archipelago to visit as many as ten islands. For this portion of the class, undergraduates will be joined by a group of Stanford alumni and friends in a format called a Stanford "Field Seminar." Students are required to complete all course readings over the summer. Students will be asked to lead discussions and carry out literature research on the evolutionary and conservation biology of particular Galapagos species. The final assignment is a seven- to ten-page paper and class presentation as we travel in Galapagos. Travel to Galapagos will be provided and paid by Sophomore College (except incidentals) and is made possible by the support of the Stanford Alumni Association Travel/Study Program and generous donors. Students will return to campus late afternoon Sunday, September 20.

Same as: ANTHRO 11SC

HUMBIO 18SC. Conservation and Development Dilemmas in the Amazon. 2 Units.
This course explores the human dimensions of conservation efforts under way in the Amazon Basin of South America. It has two specific goals: (1) to introduce the human ecology of Amazonia; and (2) to assess the prospects for joint efforts at biodiversity conservation and community development. We will draw on case studies to investigate such topics as the causes and consequences of deforestation, the social impact of parks and protected areas, and the potential for "Integrated Conservation and Development Projects" (ICDPs) such as extractive reserves, natural forest management, biodiversity prospecting, and community-based ecotourism. The course views Amazonia as a microcosm of the challenges facing conservation and development efforts today in the Third World. Part of the course is an intensive 11-day expedition to the Peruvian Amazon, at no extra cost, to observe firsthand the conservation and development dilemmas discussed in class. We will visit ecologies in the rainforest, walking miles of trails to learn about local flora, fauna, and conservation efforts. We will also visit Machu Picchu in the upper reaches of the rainforest. For the travel portion of the class, undergraduates will be joined by a group of Stanford alumni and friends. Student contributions and presentations are emphasized throughout the course. Students are expected to come well-prepared to each session, to lead discussions, and to carry out literature research. The final assignment is a 6 to 8 page paper on a case study of your own choosing or an equivalent piece of a longer collaborative paper; that offers a critical assessment of one particular conservation and/or development project in or near the region we will visit. Students will present the main findings of their papers in a joint seminar of undergraduates and alumni as we travel in the Peruvian Amazon. n

Students will arrive on campus and will be housed at Stanford until we leave for the Amazon. Travel to and from Peru is organized by the Travel/Study Program of the Stanford Alumni Association. Costs are defrayed by the Stanford Field Seminar Fund and generous donors.

Same as: ANTHRO 10 SC
HUMBIO 19SC. Parks and Peoples: Dilemmas of Protected Area Conservation in East Africa. 2 Units.
The world-famous landscapes of East Africa, including Serengeti National Park, Ngorongoro Conservation Area, and the Rift Valley lakes of Tanzania, form the backdrop for this special course on protected area conservation. The course is designed to explore the pros and cons of parks and protected areas as they impact flora, fauna, and human inhabitants, and to address the dilemma of how to achieve conservation in a manner that creates local community benefits and is socially just. We will use a case study approach to ask: (1) What approach to protected area (PA) conservation has been taken in each case? Who are the key proponents and what are their main objectives? (2) How successful has the protected area been at achieving its conservation goals? (3) What are the benefits of the PA to people and who receives them? (4) What are the costs of the PA to people and who pays them? (5) Where benefits are not commensurate to costs, what, if anything, is being done to address the imbalance? How well is it working? (6) Are there alternatives or variations on the theme of protected area conservation that would be more realistic and beneficial? How could the interests of parks and people be made more compatible in each case? Is there any chance for an "integrated conservation-development project" (ICDP), or is that just "wishful thinking," as some critics insist? This course includes an intensive 12-day expedition to Tanzania to observe firsthand the dilemmas of parks and peoples we have discussed in class. We are scheduled to visit Tarangire, Lake Manyara, Mt. Meru, and Serengeti National Parks, as well as the Ngorongoro Conservation Area. Both on campus and in Tanzania, the course emphasizes student contributions and presentations. Students are expected to come well-prepared to each and every session, and will be asked to lead discussions plus carry out literature research on particular protected areas or conservation issues of interest to them, or on alternative conservation strategies. The final assignment for the seminar is to complete a 5- to 7-page paper on some aspect of conservation dilemmas in East Africa, preferably Tanzania, and to present the main findings of that paper in a joint seminar of undergrads and alumni as we travel in East Africa.

HUMBIO 26. 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 135X, EDUC 335X, MED 235

HUMBIO 27. Traditional Chinese Medicine. 1 Unit.
The philosophy and history behind traditional Chinese medicine. Concepts such as Qi, Yin/Yang, meridians, Chinese organs, and the 5 elements. How these concepts are applied through techniques such as acupuncture, herbal medicine, Qi gong, and massage. How traditional Chinese medicine is understood from a scientific standpoint. Political and socioeconomic implications. Observation of an acupuncturist. Readings on the integration of Eastern and Western medicine and on traditional Chinese medicine.

HUMBIO 29A. Well-Being in Immigrant Children & Youth: A Service Learning Course. 3 Units.
This is an interdisciplinary course that will examine the dramatic demographic changes in American society that are challenging the institutions of our country, from health care and education to business and politics. This demographic transformation is occurring first in children and youth, and understanding how social institutions are responding to the needs of immigrant children and youth to support their well-being is the goal of this course.

Same as: CHILATST 177A, CSRE 177E, EDUC 177A

HUMBIO 74. Ethics in a Human Life. 4 Units.
Ethical questions pervade a human life from before a person is conceived until after she dies, and at every point in between. This course raises a series of ethical questions, following along the path of a person's life: questions that arise before, during, and after she lives it. We will explore distinctive questions that a life presents at each of several familiar stages: prior to birth, childhood, adulthood, death, and even beyond. We will consider how some philosophers have tried to answer these questions, and we will think about how answering them might help us form a better understanding of the ethical shape of a human life as a whole. Seminar for Juniors and Seniors in Philosophy or Humbio - others by permission.

Same as: PHIL 74A

HUMBIO 79Q. Sexuality and Society. 3 Units.
This course will explore how sexual identity, attitudes, and behaviors are shaped by the messages sent by the various agents of society such as schools, family, peers, media, and religious, medical, and political institutions. The interaction of biology, psychology, and socio-cultural factors, such as gender roles and sexual/relationship scripts will be discussed, as will the intersection of sexuality and notions of love, romance, and commitment. Critical developmental periods, such as adolescence and emerging adulthood will be examined in depth. Students will explore their own values and feelings about sexuality and come to an understanding of how their beliefs were formed. We will discuss how information about sexuality is disseminated in our society and what we can do to help ensure that such information is used in a way that promotes healthy self-conceptions, behavior, and relationships.
HUMBIO 81Q. Introduction to Child Nutrition. 3 Units.
This course examines contemporary childhood nutrition in America, from the level of the intestinal villus to the food marketing directed at children, as well as the diseases associated with inappropriate nutrition. Students will obtain an understanding of what constitutes a healthy diet for growth and how dietary needs change throughout childhood and adolescence. We will review existing community and school-based nutrition interventions as well as pertinent literature on child nutrition. Students will also gain practical experience in healthy food preparation, emphasizing a seed-to-table approach.

HUMBIO 82A. Qualitative Research Methodology. 3 Units.
Goal is to develop knowledge and skills for designing and conducting qualitative research studies including purposes, conceptual contexts, research questions, methods, validity issues, and interactions among these facets. Each student designs a qualitative research study.

HUMBIO 82B. Advanced Data Analysis in Qualitative Research. 3 Units.
For students writing up their own qualitative research. Students prepare a complete draft presenting their own qualitative research study including results, with reports drafted section by section, week by week. Class provides feedback, guidance, support.

HUMBIO 84. Practical Analysis of Epidemiologic and Biological Data. 3 Units.
This course will teach students how to think about and analyze quantitative data. Students will learn to apply univariate and multivariable methods (using Stata software) to either their own data or data from publicly available sources. A central part of the course will consist of the joint planning and execution of an epidemiologic analysis of real-world data and the production of a manuscript for submission to a scientific journal. This course focuses on health-related data, although these methods can be applied much more broadly.

HUMBIO 85A. Essential Statistics for Human Biology. 4 Units.
Introduction to statistical concepts and methods that are essential to the study of questions in biology, environment, health, epidemiology and related areas. The course will teach and use the computer language R. Topics include distributions, probabilities, likelihood, linear models; illustrations will be based on recent research. Same as: BIO 108

HUMBIO 86Q. Love as a Force for Social Justice. 3 Units.
Preference to sophomores. Biological, psychological, religious, social and cultural perspectives on the concept of agape love. How love is conceptualized across cultures; agape love as the basis of many religions; different kinds of love; the biology of love; love in action for social justice; the languages of love, including art, literature, music, and poetry. Emphasis is on blog writing, participation, and oral presentation.
Same as: FEMGEN 86Q

HUMBIO 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).
Same as: MED 87Q

HUMBIO 88. Introduction to Statistics for the Health Sciences. 3 Units.
Students will learn the statistical tools used to describe and analyze data in the fields of medicine and epidemiology. This very applied course will rely on current research questions and publicly available data. Students will gain proficiency with Stata to do basic analyses of health-related data, including linear and logistic regression, and will become sophisticated consumers of health-related statistical results.

HUMBIO 89. Statistics in the Health Sciences. 3 Units.
This course aims to provide a firm grounding in the foundations of probability and statistics, with a focus on analyzing data from the health sciences. Students will learn how to read, interpret, and critically evaluate the statistics in medical and biological studies. The course also prepares students to be able to analyze their own data, guiding them on how to choose the correct statistical test, avoid common statistical pitfalls, and perform basic functions in R deducer.

HUMBIO 91Q. Neuroethology: The Neural Control of Behavior. 3 Units.
Preference to sophomores. Animal behavior offers insights about evolutionary adaptations and this seminar will discuss the origins of the study of animal behavior and its development to the present. How does the nervous system control behavior and how is it changed by behavior? We will analyze and discuss original research papers about the neural basis of behavior. The use and misuse of parallels between animal and human behavior. Possible field trip to observe animals in their natural habitat.

HUMBIO 92Q. Health and Security. 3 Units.
In this course, we explore the interconnections between health and three types of security: human, national, and international. Health is obviously a component of human security, but is it also a concern of national security or international security? Should it be? What are the potential benefits, costs, and risks or treating health as a national or international security issue? The course will provide a broad overview of key policy issues concerning global health, and will assess how global governance is addressing these issues.

HUMBIO 94Q. Law, Lawyers and Justice in Cinema. 4 Units.
Examination of how the law, justice and lawyers are depicted in film, how real the depictions are, and the social issues that are the subjects of the film and the effect of film on change, attitudes and policy.

HUMBIO 96Q. Injustice, Advocacy and Courage: The Path of Everyday Heroes. 3 Units.
This course will study the paradigms of people of courage, action and energy who have fought against injustice by advocating for causes against great odds and at personal risk. The focus will be on everyday people who have taken action, often at great personal risk, not for ambition, but because of their convictions and steadfast commitment to their beliefs.

HUMBIO 97Q. Sport, Exercise, and Health: Exploring Sports Medicine. 3 Units.
Preference to sophomores. Sports medicine is the practice of clinical medicine at the interface between health and performance, competition and well-being. While sports medicine had its origins in providing care to athletes, medical advances developed in care of athletes exerted a great effect on the nature and quality of care to the broader community. Topics include sports injuries, medical conditions associated with sport and exercise, ethics, coaching, women’s issues, fitness and health, and sports science. Case studies.
Same as: ORTHO 97Q

HUMBIO 99Q. Becoming a Doctor: Readings from Medical School, Medical Training, Medical Practice. 3 Units.
Preference to sophomores. For students considering medicine as a career. Goal is to acquaint students with medical school, training in medicine and surgery, and the practice of medicine and surgery using stories to illustrate the topics: how to pick a medical school and a residency; how medicine affects family life, especially children; the differences between surgical and medical specialties; the advantages and disadvantages among academic/teaching, pure research, group practice, HMO, hospital staff, or private practice; malpractice concerns; financial considerations; and the importance of empathy.
HUMBIO 111. Human Dimensions of Global Environmental Change: Resilience, Vulnerability, and Environmental Justice. 3 Units.
The complexity of social and political issues surrounding global environmental change. Emphasis is on synergies precipitated by human-induced climatic change. Case studies and scenarios to explore the vulnerability and resilience in households, communities, regions, and nation states most affected by extreme weather conditions. Their concerns, livelihood changes, and diverse responses of rural smallholders, indigenous communities, the state, and local and regional migrants. Central theme is environmental justice. Same as: ANTHRO 173

HUMBIO 111M. Marine Resource Economics and Conservation. 5 Units.
Economic and ecological frameworks to understand the causes of and potential solutions to marine resource degradation. Focus on conservation of marine biodiversity and ecosystem-based management. Applications include: commercial and recreational fisheries, marine reserves, and offshore energy production. Same as: EARTH SYS 156M, ECON 156

HUMBIO 112. Conservation Biology: A Latin American Perspective. 3 Units.
Principles and application of the science of preserving biological diversity. Conceptually, this course is designed to explore 4 major components relevant to the conservation of biodiversity, as exemplified by the Latin American region. The conceptual frameworks and principles, however, should be generally applicable, and provide insights for all regions of the world, including those of lesser biodiversity. Satisfies Central Menu Area 4 for Bio majors. Prerequisite: BIO 101, or BIO 43 or HUMBIO 2A with consent of instructor. Graduate level students will be expected to conduct a literature research exercise leading to a written paper, addressing a topic of their choosing, derived from any of the themes discussed in class. Same as: BIO 144, BIO 234

HUMBIO 113. The Human-Plant Connection. 3 Units.
The intertwined biology of humans and plants, particularly the ways in which people and plants have imposed selection pressures and ecological change on one another. Topics include evolution and basic plant structure; plant domestication; effects of agriculture on human health and physiology; plants in traditional and contemporary diets; and human influences on plant biology through genetic manipulation and environmental change. Class meetings center on journal articles. Final project includes written and multimedia presentations.

HUMBIO 113S. Healthy/Sustainable Food Systems: Maximum Sustainability across Health, Economics, and Environment. 4 Units.
Discussion-based seminar. Focus on problems with and systems-based solutions to food system issues. Four particular settings are addressed: University, worksite, hospital, and school food. Traditional vs. disruptive food system models compared and contrasted. The goal is to determine how best to maximize sustainability across several dimensions, including health, economics, and the environment. Underlying class themes include social justice and the potential for changing social norms around food production and consumption.

HUMBIO 114. Environmental Change and Emerging Infectious Diseases. 3-5 Units.
The changing epidemiological environment. How human-induced environmental changes, such as global warming, deforestation and land-use conversion, urbanization, international commerce, and human migration, are altering the ecology of infectious disease transmission, and promoting their re-emergence as a global public health threat. Case studies of malaria, cholera, hantavirus, plague, and HIV. Same as: ANTHRO 177, ANTHRO 277

HUMBIO 115. Human Health and Global Environmental Change. 3 Units.
Climate change, biodiversity loss, and other forms of global environmental change matter profoundly to human health. This class will bridge the fundamental science that informs our understanding of global environmental changes to health outcomes and challenge students to rigorously assess proposed remedies to the causes and consequences of global environmental changes.

HUMBIO 117H. Human Behavioral Ecology. 3-5 Units.
Theory, method, and application in anthropology. How theory in behavioral ecology developed to understand animal behavior is applied to questions about human economic decision making in ecological and evolutionary contexts. Topics include decisions about foraging and subsistence, competition and cooperation, mating, and reproduction and parenting. Same as: ANTHRO 161, ANTHRO 261

HUMBIO 118. Theory of Ecological and Environmental Anthropology. 5 Units.
Dynamics of culturally inherited human behavior and its relationship to social and physical environments. Topics include a history of ecological approaches in anthropology, subsistence ecology, sharing, risk management, territoriality, warfare, and resource conservation and management. Case studies from Australia, Melanesia, Africa, and S. America. Same as: ANTHRO 90C

HUMBIO 119. Demography: Health, Development, Environment. 3 Units.
Demographic methods and their application to understanding and projecting changes in human infant, child, and adult mortality and health, fertility, population, sex ratios, and demographic transitions. Progress in human development, capabilities, and freedoms. Relationships between population and environment. Prerequisites: numeracy and basic statistics; Biology or Human Biology core; or consent of instructor. Same as: BIO 102

HUMBIO 120. Health Care in America: An Introduction to U.S. Health Policy. 4 Units.
Health policy and health care delivery from a historical and a current policy perspective. Introduces cost, quality, and access as measures of health system performance. Considers institutional aspects of health care reform.

HUMBIO 120A. American Health Policy. 3 Units.
Issues in health care reform and the policy making process, the evolution of current systems, and theories underlying efforts for change. The national search for solutions to the problems of the uninsured, and the feasibility, options, and ramifications of alternative proposals for health care reform. Student presentations. Prerequisite: Human Biology core or equivalent, Human Biology 120, or consent of instructor.

HUMBIO 121. Critical Issues in Child Health. 4 Units.
Integrated picture of the physical and psychosocial health factors that result in a healthy child building on principles taught in the Human Biology core. Students apply basic human physiology to the physiology of the child to develop perspective on global pediatric health challenges and how the cultural context influences and defines the child living within it.
HUMBIO 121E. Ethnicity and Medicine. 1-3 Unit.
Weekly lecture series. Examines the linguistic, social class, and cultural factors that impact patient care. Presentations promote culturally sensitive health care services and review contemporary research issues involving minority and underserved populations. Topics include health care inequities and medical practices of African Americans, Asians, Latinos, Native Americans, immigrants, and refugees in both urban and rural settings. 1 unit requires weekly lecture attendance, completion of required readings, completion of response questions; 2 units requires weekly lecture attendance and discussion session, completion of required readings and weekly response questions; additional requirement for 3 units (HUMBIO only) is completion of a significant term paper Only students taking the course for 3 units may request a letter grade.
Same as: FAMMED 244

HUMBIO 122. Beyond Health Care: Seeking Health in Society. 3 Units.
Available evidence at the national and cross-country level linking social welfare interventions and health outcomes. If and how non-health programs and policies could have an impact on positive health outcomes. Evaluation of social programs and policies that buffer the negative health impact of economic instability and unemployment among adult workers and their children. Examination of safety nets, including public health insurance, income maintenance programs, and disability insurance. Prerequisites: HUMBIO 4B or equivalent, and background in research methods and statistics.
Same as: PEDS 222

HUMBIO 122M. Challenges of Human Migration: Health and Health Care of Migrants and Autochthonous Populations. 3 Units.
An emerging area of inquiry. Topics include: global migration trends, health Issues/aspects of migration, healthcare and the needs of immigrants in the US, and migrants as healthcare providers: a new area of inquiry in the US. Class is structured to include: lectures lead by the instructor and possible guest speakers; seminar, discussion and case study sessions led by students.
Same as: PEDS 212

HUMBIO 122S. Social Class, Race, Ethnicity, and Health. 4 Units.
Examines health disparities in the U.S., looking at the patterns of those disparities and their root causes. Explores the intersection of lower social class and ethnic minority status in affecting health status and access to health care. Compares social and biological conceptualizations of race and ethnicity.

HUMBIO 123. Obesity in America: Clinical and Public Health Implications. 3-4 Units.
Interdisciplinary clinical, research, and policy approaches. The prevalence, predictors, and consequences of obesity and diabetes; biological and physiological mechanisms; clinical treatments including medications and surgery; and the relevance of behavioral, economic, and policy approaches to obesity prevention and control. Prerequisite: Human Biology core or equivalent, or consent of instructor.

HUMBIO 124C. Global Child Health. 4 Units.
This course will introduce key challenges to the health and wellbeing of children worldwide, with a particular focus on children in low- and middle-income countries. It will review the leading causes of morbidity and mortality, identify interventions to address some of the biggest child health problems, and provide an overview of the roles of culture, gender, and civil society on child health and health policy.

HUMBIO 124E. 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: MED 236

HUMBIO 125. Current Controversies in Women's Health. 2-3 Units.
Interdisciplinary. Focus is primarily on the U.S., with selected global women's health topics. Topics include: leading causes of morbidity and mortality across the life course; reproductive (e.g. gynecologic & obstetric) health issues; sexual function; importance of lifestyle (e.g. diet, exercise, weight control), including eating disorders; mental health; sexual and relationship abuse; issues for special populations. In-class Student Debates on key controversies in women's health. Guest lecturers. Undergraduates must enroll in HumBio 125 for 3 units. PhD minor in FGSS, enroll in FEMGEN 256 for 3 units and for a letter grade. Med students enroll in OBGYN 256 for 2 units. Spring.
Same as: FEMGEN 256, OBGYN 256

HUMBIO 126. Promoting Health Over the Life Course: Multidisciplinary Perspectives. 3 Units.
Disease prevention and health promotion topics pertinent to different stages of the life span emphasizing healthy lifestyle and reducing risk factors in both individuals and communities. Focus is on scientific investigation, the application of behavioral science to risk reduction strategies, and the importance of health promotion as a social and economic imperative. Topics include: epidemiology of chronic diseases; social determinants of health, behavior change; obesity, nutrition, and stress; children, young adult, mid-life and aging health issues; health care delivery and public health system; workplace wellness programs; and other additional issues. Prerequisite: Human Biology core or equivalent, or consent of instructor.

HUMBIO 127A. Community Health: Assessment and Planning I. 4 Units.
Major determinants of health in a community. Working with community partners to identify health issues and plan programs and policies to prevent disease and promote health. Service learning component involving students in community health assessment techniques. Final grade given upon completion of HUMBIO 127B. Service Learning Course (certified by Haas Center). Prerequisite: 4B or equivalent, or consent of instructor.

HUMBIO 127B. Community Health: Assessment and Planning II. 4 Units.
Continuation of 127A. Service learning course with emphasis on conducting community health assessment and planning projects in collaboration with community-based organizations. Service Learning Course (certified by Haas Center). Prerequisite: 4B or equivalent, 127A, or consent of instructor.

HUMBIO 128. Community Health Psychology. 4 Units.
Social ecological perspective on health emphasizing how individual health behavior is shaped by social forces. Topics include: biobehavioral factors in health; health behavior change; community health promotion; and psychological aspects of illness, patient care, and chronic disease management. Prerequisites: HUMBIO 3B or PSYCH 1, or equivalent.
Same as: PSYCH 101

HUMBIO 129. Critical Issues in International Women's Health. 4 Units.
Women's lives, from childhood through adolescence, reproductive years, and aging. Economic, social, and human rights factors, and the importance of women's capacities to have good health and manage their lives in the face of societal pressures and obstacles. Emphasis is on life or death issues of women's health that depend on women's capacity to exercise their human rights including maternal mortality, violence, HIV/AIDS, reproductive health, and sex trafficking. Organizations addressing these issues. A requirement of this class is participation in public blogs. Prerequisites: Human Biology core or equivalent or consent of instructor.
Same as: FEMGEN 129
HUMBIO 129M. Measuring Global Health. 4 Units.
Open to MD, graduate, and undergraduate students. Assessing the global burden of disease, its distribution among and within countries, its causes, and appropriate interventions requires rigorous quantitative approaches. This course develops skills in these areas by critically examining questions like: How do we know who is sick and where? How are risk factors incorporated into our projections of future disease trends? How do we combine mortality and morbidity in a meaningful way? What works for improving health efficiently? Workshops build familiarity with relevant data and their analysis. Prerequisite: coursework in statistics, biostatistics, quantitative epidemiology, econometrics, or equivalent. Same as: HRP 241, MED 231

HUMBIO 129S. Global Public Health. 4 Units.
The class is an introduction to the fields of international public health and global medicine. It focuses on resource poor areas of the world and explores major global health problems and their relation to policy, economic development and human rights. The course is intended for students interested in global health, development studies, or international relations, and provides opportunities for in-depth discussion and interaction with experts in the field. 

HUMBIO 129W. 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.

HUMBIO 130. Human Nutrition. 4 Units.
The study of food, and the nutrients and substances therein. Their action, interaction, and balance in relation to health and disease. Emphasis is on the biological, chemical, and physiological processes by which humans ingest, digest, absorb, transport, utilize, and excrete food. Dietary composition and individual choices are discussed in relationship to the food supply, and to population and cultural, race, ethnic, religious, and social economic diversity. The relationships between nutrition and disease; ethnic diets; vegetarianism; nutritional deficiencies; nutritional supplementation; phytochemicals.

HUMBIO 133. Human Physiology. 4 Units.
Human physiology will be examined by organ systems: respiratory, cardiovascular, renal, and gastrointestinal. Concepts of cell and molecular biology that underlie organ development, pathophysiology and opportunities for regenerative medicine will be introduced. Signaling and integrative control by the endocrine, autonomic and central nervous systems will be introduced. Prerequisite: Biology or Human Biology core. Same as: BIO 112

HUMBIO 135. Exercise Physiology. 4 Units.
How body systems respond to the stress of acute exercise and adapt to chronic exercise training. How the cardiovascular system adapts to optimize oxygen delivery and utilization, how muscles generate force and hypertrophy in response to training, how metabolic/biochemical pathways are regulated to support the increased energy demand of exercise. Theories on the causes of fatigue and muscle soreness, and on what limits human performance. Applied topics such as the effects of aging, gender, and environmental conditions (high altitude, heat, cold, microgravity) on exercise capacity will also be discussed. Portions of the class will be flipped with some lectures online and others in class. Heavy emphasis on practical physiology in the second half of the course. Prerequisite: Human Biology core, Biology core, or equivalent, or consent of instructor.

HUMBIO 135S. Applied Topics in Exercise Physiology and Metabolism. 3 Units.
Discussions of controversial topics related to exercise physiology, sports performance, impacts of aging and environmental physiology. Special focus on how to get science out of the lab via novel training programs, medical device development, and science communication. Students will learn the fundamentals of science storytelling and mixed media presentation of ideas. A requirement of this class is participation in blogs, participation in discussions and evaluations of physiology research, and creation of a science-based story to share with the class. If class is full, contact instructor for an application. Enrollment limited to 10. Prerequisites: B+ or higher in HBI 135 and/or consent of instructor.

HUMBIO 136. Human Physiology Laboratory. 4 Units.
This laboratory course is inquiry based, so the subject matter of the course will change in successive years. In 2015, the two questions to be researched concurrently in Spring will be (1) Can heat-related performance decrements incurred by individuals clad in impermeable attire (e.g., biohazard personal protective suits) be mitigated?; and (2) Can the sensation of thermal comfort be affected by regional skin temperature manipulations. Students will participate both as experimenters and as subjects. The laboratory work will focus on exercise and temperature. Thus, participants must be in good physical condition and be willing to participate in strenuous exercise routines under adverse environmental conditions. Varsity athletes currently participating in a spring sport should first talk with Prof. Heller before applying. Combined Lab/Discussion sessions will be Tue and Thurs 1:15 - 5:05. You must attend both days each week, with no conflicts with other courses. Prerequisite is Bio 42 or HumBio 4A. Satisfies WIM for majors in biology. Enrollment for Spring 2015 course is limited to 16 students by permission. See: sites.stanford.edu/bio107 for the link to online application form. Same as: BIO 107

HUMBIO 139E. Sport and Exercise Medicine. 3 Units.
This is an upper division lecture course taught by the course directors and guest lecturers (experts from the field of sports and exercise medicine) who will cover a range of topics within sports medicine and related issues. In return-to-play decisions, the balance point between health and harm in sport, the role of sports medicine in the prevention of chronic disease through exercise, common sports injuries, exercise physiology, and diseases common to athletes. Students will develop critical reading, thinking and writing skills as well as oral presentation skills and the confidence to engage in verbal exchange.

HUMBIO 140. 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 life course, 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, MED 240

HUMBIO 141. Disability, Gender, & Identity. 5 Units.
Course explores visible and invisible disabilities, focusing on issues of gender and identity. The course emphasizes psychological as well as physical health, cross-cultural variables, diversity of disability experiences, legal and political aspects, work and home accommodations, self-labeling, caretaking, stigma and passing, and the difference gender makes to how disabilities are experienced. Disabilities covered include blindness, multiple sclerosis, diabetes, arthritis, emotional and learning disabilities, and conditions requiring wheelchairs and other forms of physical assistance. Same as: AMSTUD 260, FEMGEN 260, FEMGEN 360
HUMBIO 142. Adolescent Development. 4 Units.
Underlying changes and their consequences in everyday functioning. Physical, cognitive, social, and sexual development; how these changes influence the emerging sense of identity, autonomy, and intimacy. Contexts in which adolescents move such as family, friends and peers, school, and workplace. Focus is on normal development of boys and girls; attention to problem outcomes including eating disorders, depression, and teen pregnancy. Prerequisite: 3B or PSYCH 1, or consent of instructor.

HUMBIO 142M. Special Topics in Adolescent Mental Health. 4 Units.
Includes the study of aspects of common disorders seen in adolescents and children, such as prevalence, developmental course, gender differences, theoretical explanations, and therapeutic interventions. Topics will include mood/anxiety disorders, eating disorders, learning disabilities and ADHD, sexual risk behaviors, developmental disorders, substance abuse, and self-harm. Goals of this course include getting students to think critically about the unique mental health needs of adolescents, collaborating on devising ways to improve the way our society meets those needs, and strengthening writing and communication skills applicable to this area of inquiry.

HUMBIO 143. Adolescent Sexuality. 4 Units.
Developmental perspective. Issues related to scientific, historical, and cultural perceptions; social influences on sexual development; sexual risk; and the limitations and future directions of research. Sexual identity and behavior, sexually transmitted diseases including HIV, pregnancy, abortion, gay and lesbian youth, sex education and condom availability in schools, mass media, exploitative sexual activity, and difficulties and limitations in studying adolescent sexuality. Legal and policy issues, gender differences, and international and historical trends. Prerequisite: Human Biology core or equivalent, or consent of instructor.

HUMBIO 144. Boys’ Psychosocial Development. 3 Units.
From early childhood through adolescence. Emphasis is on how boys’ lives and experiences are embedded within their interpersonal relationships and social and cultural contexts. Interdisciplinary approach including perspectives from fields such as psychology, sociology, and education. Prerequisite: Human Biology core, or Developmental Psychology, or consent of instructor.

HUMBIO 145L. The Biology and Evolution of Language. 4-5 Units.
Lecture course surveying the biology, linguistic functions, and evolution of the organs of speech and speech centers in the brain, language in animals and humans, the evolution of language itself, and the roles of innateness vs. culture in language. Suitable both for general education and as preparation for further studies in anthropology, biology, linguistics, medicine, psychology, and speech & language therapy. Anthropology concentration: CS, EE. No prerequisites.
Same as: ANTHRO 171, ANTHRO 271

HUMBIO 146D. Developmental Disabilities: From Biology to Policy. 3 Units.
Fifteen percent of US children have disabilities. While advances in medicine and technology have increased life expectancy for these children, health care delivery, education, and public attitudes have not kept pace. Students in this course will learn the possibilities and limitations of new biomedical treatments of Down syndrome, cerebral palsy, and autism. Students will also evaluate the impact of public policy initiatives, such as the Individuals with Disabilities Education Act and Americans with Disabilities Act on inclusion and participation in society.
Same as: PEDS 246

HUMBIO 148W. Women, Fertility, and Work. 5 Units.
How do choices relating to bearing, nursing, and raising children influence women's participation in the labor force? Cultural, demographic, and evolutionary explanations, using crosscultural case studies. Emphasis is on understanding fertility and work in light of the options available to women at particular times and places.
Same as: ANTHRO 151, ANTHRO 251

HUMBIO 149. Psychological and Educational Resilience Among Children and Youth. 4 Units.
Theoretical, methodological, and empirical issues pertaining to the psychological and educational resilience of children and adolescents. Overview of the resilience framework, including current terminology and conceptual and measurement issues. Adaptive systems that enable some children to achieve successful adaptation despite high levels of adversity exposure. How resilience can be studied across multiple levels of analysis, ranging from cell to society. Individual, family, school, and community risk and protective factors that influence children's development and adaptation. Intervention programs designed to foster resilient adaptation in disadvantaged children's populations.
Same as: EDUC 256

HUMBIO 149L. Longevity. 4 Units.
Interdisciplinary. Challenges to and solutions for the young from increased human life expectancy: health care, financial markets, families, work, and politics. Guest lectures from engineers, economists, geneticists, and physiologists.
Same as: NENS 202, PSYCH 102

HUMBIO 150A. Assisted Reproductive Technologies. 1-3 Units.
Primary and current literature in basic and clinical science aspects of assisted reproductive technologies (ART), and demonstrations of current ART techniques including in vitro fertilization and embryo culture, and micromanipulation procedures such as intracytoplasmic sperm injection and embryo biopsy and cryopreservation. Class only may be taken for 1 unit. 2 units includes papers and attendance at clinical demonstrations. 3 units includes a term paper. Recommended: DBIO 201, or consent of instructors. Same as: OBGYNE 202

HUMBIO 151R. Biology, Health and Big Data. 3 Units.
We are living in the midst of a revolution in the accessibility and availability of biological and medical data. How can all this data be used to improve human health? In this course, students will look at case studies from diabetes and cancer research to learn how to access publicly available data ranging from gene or protein level datasets to information about clinical trials. Students will apply what they learn from the case studies to develop a research proposal and presentation on a biology-related topic of their choice. The class will have a small group workshop-type format. Students will gain skills in research methods including accessing, analyzing and presenting data. There will be exercises using the statistical package R. Prior programming experience is not required. Prerequisites: HumBio 2A, 3A or equivalent.

HUMBIO 152. Viral Lifestyles. 3 Units.
Viral lifestyle is a seminar devoted to exploring contemporary topics in microbiology with a focus on the global microbiome. The course includes lectures and will provide an opportunity for students to interact with each other, the instructor and guest lecturers to explore novel research areas in microbiology that are still being formed. The course will begin with lectures on topics such as cross-species transmission of microbes and human microbiome and will transition to presentation and discussion led by student groups. A significant percentage of class will be devoted to presentation and discussion focused on group projects.

HUMBIO 153. Parasites and Pestilence: Infectious Public Health Challenges. 4 Units.
Parasitic and other pestilence of public health importance. Pathogenesis, clinical syndromes, complex life cycles, and the interplay among environment, vectors, hosts, and reservoirs in historical context. Public health policy initiatives aimed at halting disease transmission. World Health Organization tropical disease targets including river blindness, sleeping sickness, leishmaniasis, schistosomiasis, mycobacterial disease (tuberculosis and leprosy), malaria, toxoplasmosis, dracunculiasis, and intestinal helminthes. Guest lecturers with expertise in disease control. Prerequisite: Human Biology core or equivalent, or consent of instructor.
HUMBIO 154A. Outbreaks, Epidemics, & Disease Control Systems. 4 Units.
This course teaches skills in disease control epidemiology. Students will engage in in-depth interdisciplinary study of disease detection and control strategies from a "systems science" perspective, which addresses classical public health dilemmas, such as how to allocate limited resources, investigate disease outbreaks, and analyze common problems at the intersection of social policy and public health. Lectures and problem sets will focus on developing quantitative skills essential to public health practice, emphasizing the use of common mathematical techniques for disease control. Readings will complement the lectures and problem sets by offering critical perspectives from the sociology of public health. In-depth case studies from non-governmental organizations, departments of public health, and international agencies will drive the course. Human Biology 154 courses can be taken separately or as a series.
Same as: SOMGEN 254

HUMBIO 154B. Principles of Epidemiology. 3 Units.
Epidemiology is the study of the distribution and determinants of health and disease in human populations. This course introduces students to observational epidemiology through major study designs along with measures of association and their computation. The course also covers how error, bias, and confounding can affect analytic findings, and how to detect and interpret interaction effects. Students will learn through lectures, problem sets, and critical appraisal of both classic and contemporary research articles. Human Biology 154 courses can be taken separately or as a series.

HUMBIO 154C. Cancer Epidemiology. 4 Units.
Clinical epidemiological methods relevant to human research in cancer will be the focus. The concepts of risk; case control, cohort, and cross-sectional studies; clinical trials; bias; confounding; interaction; screening; and causal inference will be introduced and applied. Social, political, economic, and ethical controversies surrounding cancer screening, prevention, and research will be considered. Human Biology 154 courses can be taken separately or as a series.

HUMBIO 155B. The Vaccine Revolution. 6 Units.
Advanced seminar. Human aspects of viral disease, focusing on recent discoveries in vaccine development and emerging infections. Journal club format: students choose articles from primary scientific literature, write formal summaries, and synthesize them into a literature review. Emphasis is on analysis, experimental design, and interpretation of data. Oral presentations. Enrollment limited to 8. Prerequisite: prior enrollment in HumBio 155H Humans and Viruses or MI 116, The Human Virosphere. Same as: MI 115B

HUMBIO 155H. Humans and Viruses I. 6 Units.
Introduction to human virology integrating epidemiology, molecular biology, clinical sciences, social sciences, history, and the arts. Emphasis is on host pathogen interactions and policy issues. Topics: polio and vaccination, smallpox and eradication, yellow fever and history, influenza and genomic diversity, rubella and childhood infections, adenovirus and viral morphology, ebola and emerging infection, lassa fever and immune response. Same as: MI 155H

HUMBIO 157. The Biology of Stem Cells. 3 Units.
The role of stem cells in human development and potential for treating disease. Guest lectures by biologists, ethicists, and legal scholars. Prerequisites: HumBio 2A and 3A, or the equivalent in the BioCore in Biological Sciences. Same as: DBIO 257

HUMBIO 158. The Human Genome and Disease. 3 Units.
The variability of the human genome and the role of genomic information in research, drug discovery, and human health. Concepts and interpretations of genomic markers in medical research and real life applications. Human genomes in diverse populations. Original contributions from thought leaders in academia and industry and interaction between students and guest lecturers. Students with a major, minor or coterm in Biology: 109A/209A or 109B/209B may count toward degree program but not both. Same as: BIO 109A, BIOC 109A, BIOC 209A

HUMBIO 158G. Genomics, Bioinformatics and Medicine. 3 Units.

HUMBIO 159. 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: basic course in genetics; for undergraduates, Human Biology core or equivalent or consent of instructor. Same as: HRP 238

HUMBIO 160. Human Behavioral Biology. 5 Units.
Multidisciplinary. How to approach complex normal and abnormal behaviors through biology. How to integrate disciplines including sociobiology, ethology, neuroscience, and endocrinology to examine behaviors such as aggression, sexual behavior, language use, and mental illness. Same as: BIO 150, BIO 250

HUMBIO 161. The Neurobiology of Sleep. 4 Units.
Preference to seniors and graduate students. The neurochemistry and neurophysiology of changes in brain activity and conscious awareness associated with changes in sleep/wake state. Behavioral and neurobiological phenomena including sleep regulation, sleep homeostasis, circadian rhythms, sleep disorders, sleep function, and the molecular biology of sleep. Enrollment limited to 16. Same as: BIO 149, BIO 249

HUMBIO 162. The Nervous Age: Neurosis, Neurology, and Nineteenth-century Theatre. 5 Units.
The nineteenth century witnessed profound developments in neurological and psychological sciences, developments that fundamentally altered conceptions of embodiment, agency, and mind. This course will place these scientific shifts in conversation with theatrical transformations of the period. We will read nineteenth-century neuropsychologists such as Charles Bell, Johannes Muuml;ler, George Miller Beard, Jean-Martin Charcot, and Hippolyte Bernheim alongside artists such as Percy Shelley, Georg Buuml;chner, Richard Wagner, Eacute;mile Zola, and August Strindberg. Same as: GERMAN 284, TAPS 354
HUMBIO 162H. Hysteria and Modern Culture. 3-5 Units.
The term "hysteria" has been used for centuries to categorize the mysterious ailments of others. This course will focus on the history of hysteria's representation and production from the late nineteenth century through WWI. Readings will include medical writings (Charcot, Bernheim, Freud), plays (Ibsen, Strindberg, Toller), and feminist theory (Cixous, Cleacu, Cenm, Diamond). We will also devote some attention to the ongoing influence of the discourse of hysteria on contemporary medical and popular cultures.

Same as: GERMAN 137, TAPS 169

HUMBIO 163. Neural Systems and Behavior. 4 Units.
The field of neuroethology and its vertebrate and invertebrate model systems. Research-oriented. Readings include reviews and original papers. How animal brains compare: how neural circuits are adapted to species-specifical behavior; and how the sensory worlds of different species represent the world. Lectures and required discussions. Satisfies Central Menu Area 3 for Bio majors. Prerequisites: BIO 42, HUMBIO 4A.

Same as: BIO 163, BIO 263

HUMBIO 164. Autism Spectrum Disorders. 3 Units.
Abnormal social deficits, language development and repetitive behaviors, are the core symptoms of Autism Spectrum Disorders (ASD), a group of neurodevelopmental disorders that affect about 1% of all children and costs society an estimated $35B annually. This interactive new seminar will provide an overview of our understanding of ASD, from genetics through epidemiology, biology and treatment, and the many implications for society, including the principles and problems of diagnosis, its impact upon family and lifespan, and controversies regarding its etiology, perception and care.

HUMBIO 165. Early Roots of Human Behavior. 3 Units.
A growing body of evidence suggests that the roots of human behavior are to be found in early childhood. These early behaviors have a direct effect on the quality of a child's educational experience. The educational experience, in turn, is a principal determinant of many adult outcomes that affect well-being. This course will explore how early social forces, psychological influences, and biological systems combine to affect human behavior in early childhood, in the educational experience, and throughout the life course.

HUMBIO 166. Food and Society: Exploring Eating Behaviors in Social, Environmental, and Policy Context. 4 Units.
The class examines the array of forces that affect the foods human beings eat, and when, where, and how we eat them, including human labor, agriculture, environmental sustainability, politics, animal rights/welfare, ethics, policy, culture, economics, business, law, trade, and ideology, and psychology. The class addresses the impact of current policies and actions that might be taken to improve human nutrition and health; macro-scale influences on food, nutrition, and eating behavior.

HUMBIO 167. The Art of Vision. 3 Units.
This course concerns eyes and art. It asks how eyes are built, how they process visual information, and how they are affected by diseases that are major problems in our society. These topics are illustrated through fine art and famous artists, and we explore the implications of both normal and abnormal vision for art. There are short diversions into animal eyes and the role of vision in music, literature, and sports.

HUMBIO 168. Multidisciplinary Perspectives on Guilt. 3 Units.
The seminar encompasses the personal and cultural components of guilt. It explores the behaviors that induce guilt; its relational aspects; genesis in evolutionary and developmental terms; and its normal and pathological manifestations. The cultural section includes crosscultural perspectives on guilt and its conceptions in Christianity, Judaism, Islam, Hinduism, Buddhism, and Confucianism; as well as in the philosophy of Aristotle, Kant, J. S Mill and Nietzsche, and culpability and the law. The course consists of lectures, and discussion in class and sections.

HUMBIO 170. Justice, Policy, and Science. 5 Units.
The role of science in civil rights, justice, policy, criminal justice, evidence, education, and disabled rights.

HUMBIO 170A. Sex and the Law. 4 Units.
This course uses an interdisciplinary approach to examine the laws and regulation of sex in the United States by considering the legal, policy, social, political and scientific bases (or lack thereof) of such laws, the context and objectives of sex regulation, and the political dynamics of contemporary and controversial issues presented by this subject. Some laws reflect policies to protect persons from harm related to sexual conduct, such as rape, assault and pedophilia. Other laws impose notions of morality, such as sodomy, incest or polygamy, or homosexuality, or reflect policy or social judgments regarding abortion, contraceptives, and sexual activity of minors. Regulation often concern consensual conduct. This course will consider these topics from varying perspectives and policy objectives, and in the context of Constitutional and other liberty interests.

HUMBIO 172B. Children, Youth, and the Law. 5 Units.
How the legal rights of children and adolescents in America are defined, protected, and enforced through the legal process within the context of their developmental needs and competing societal interests. Topics: origins and definitions of children's rights; adoption; custody; the juvenile justice system; education; informed consent; health care; protection from harm and child welfare; due process; and privacy and freedom of expression. Interactive, using hypotheticals for discussion and analysis. A and B alternate annually; students may take one or both. Prerequisite: Human Biology core or equivalent, or consent of instructor.

HUMBIO 173. Science, Innovation and the Law. 3 Units.
The interaction of science, business and law: how scientific ideas are protected by law; the rights of those who invent, develop, and finance scientific discovery; and how ideas are commercialized and brought to market. What kinds of research, discovery, and innovation are protected; who has rights that can be protected; what kinds of rights can be protected, and the kinds of protections that apply; how inventions are commercialized; and the success and failure of businesses based on scientific discovery. Prerequisite: Human Biology core or equivalent, or consent of instructor.

HUMBIO 174. Foundations of Bioethics. 3 Units.
Classic articles, legal cases, and foundational concepts. Theoretical approaches derived from philosophy. The ethics of medicine and research on human subjects, assisted reproductive technologies, genetics, cloning, and stem cell research. Ethical issues at the end of life. Prerequisite: Human Biology core or equivalent, or consent of instructor.

HUMBIO 175. Health Care as Seen Through Medical History, Literature, and the Arts. 3 Units.
The differences between disease as pathology and as the patient's experience. Topics include: patient-doctor relationships; medical technology; the changing focus on illness; gender issues; love, sex, and illness; mental illness; sick children; and death and dying. Limited enrollment.
HUMBIO 175H. 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, MED 220

HUMBIO 175L. 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, CSRE 129B, FRENCH 229, MED 234

HUMBIO 175S. Novels and Theater of Illness. 3 Units. Illness and disease through novels and plays by authors including Shakespeare, Miller, Sophocles, Hemingway, and Camus. How sickness involves the patient, family, community, and state. Limited enrollment.

HUMBIO 176. Impact of Infectious Diseases on Human History. 3 Units. Impact of infectious diseases on human society. Some topics include: Plague of Justinian and 14th century; impact on exploration, trade and conquest; how slavery, malaria and yellow fever conspired to alter the New World; Microbes and war; diseases of poverty, tuberculosis and others; Cholera and public health; pandemic influenza; diseases of human progress. Students give a 30 minute presentation on a topic of their choosing that exemplifies an aspect of the impact of politics, societal influences, religion or other forces on infectious diseases.

Same as: MED 176

HUMBIO 176A. Medical Anthropology. 4 Units. Emphasis is on how health, illness, and healing are understood, experienced, and constructed in social, cultural, and historical contexts. Topics: biopower and body politics, gender and reproductive technologies, illness experiences, medical diversity and social suffering, and the interface between medicine and science.

Same as: ANTHRO 82, ANTHRO 282

HUMBIO 177C. Culture, Narrative, and Medicine. 5 Units. This course examines the ways in which medicine is practiced in diverse cultural contexts with narrative skills of recognizing, interpreting and being moved by the stories of illness. It is an examination of the human experience of illness and healing through narratives as presented in literature, film, and storytelling. We explore how cultural resources enable and empower healing and how narrative medicine can guide the practice of culturally competent medical care.

Same as: ANTHRO 178A

HUMBIO 178. Ethics and Politics of Public Service. 5 Units. Ethical and political questions in public service work, including volunteering, service learning, humanitarian assistance, and public service professions such as medicine and teaching. Motives and outcomes in service work. Connections between service work and justice. Is mandatory service an oxymoron? History of public service in the U.S. Issues in crosscultural service work. Integration with the Haas Center for Public Service to connect service activities and public service aspirations with academic experiences at Stanford. [This class is capped but there are some spaces available with permission of instructor. If the class is full and you would like to be considered for these extra spaces, please email sburbank@stanford.edu with your name, grade level, and a paragraph explaining why you want to take the class.]

Same as: CSRE 178, ETHICSOC 133, PHIL 175A, PHIL 275A, POLISCI 133, PUBPOL 103D, URBANST 122

HUMBIO 178T. Human Trafficking: Historical, Legal, and Medical Perspectives. 3 Units. (Same as History 105C.) Interdisciplinary approach to understanding the extent and complexity of the global phenomenon of human trafficking, especially for forced prostitution and labor exploitation, focusing on human rights violations and remedies. Provides a historical context for the development and spread of human trafficking. Analyzes the current international and domestic legal and policy frameworks to combat trafficking and evaluates their practical implementation. Examines the medical, psychological, and public health issues involved. Uses problem-based learning. Students interested in service learning should consult with the instructor and will enroll in an additional course.

Same as: FEMGEN 5C, HISTORY 5C, SOMGEN 205

HUMBIO 179S. Spirituality and Healing. 3-5 Units. The puzzle of symbolic healing. How have societies without the resources of modern medicine approached healing? Why do these rituals have common features around the world? Shamanism, spirit possession, prayer, and the role of placebos in modern biomedicine. Students do ethnographic work and practical explorations along with more traditional scholarly approaches to learning.

Same as: ANTHRO 184

HUMBIO 180. Human Skeletal Anatomy. 5 Units. Study of the human skeleton (a. k. a. human osteology), as it bears on other disciplines, including medicine, forensics, archaeology, and paleoanthropology (human evolution). Basic bone biology, anatomy, and development, emphasizing hands-on examination and identification of human skeletal parts, their implications for determining an individual's age, sex, geographic origin, and health status, and for the evolutionary history of our species. Three hours of lecture and at least three hours of supervised and independent study in the lab each week.

Same as: ANTHRO 175, ANTHRO 275, BIO 174, BIO 274

HUMBIO 186. Biological Clocks. 3 Units. The biological basis for endogenous timekeeping in organisms from flies to human beings. How biological clocks are constructed at the molecular, tissue, and behavioral levels; how these clocks interact with other physiological systems and allow animals to anticipate changes in their environment. Applications of circadian rhythm principles to treating human disorders and diseases such as cancer. Prerequisite: Biology or Human Biology core, or consent of instructor.
HUMBIO 192. Capstone. 1-5 Unit.
Completion of the capstone project, normally taken in the student's final quarter. A senior year capstone experience is a mentored project that builds upon or extends work or a theme already established in the Area of Concentration (AC). Requirements include participation in the capstone symposium, which would involve a presentation followed by a brief question and answer session. Enrollment strictly by permission of instructor. May be taken for a maximum 3 quarters of credit. Total of units not to exceed 9.

HUMBIO 193. Research in Human Biology. 1-5 Unit.
Independent research conducted under faculty supervision, in junior or senior year, normally but not necessarily in pursuit of an honors project. May be taken for a maximum 3 quarters of credit. Prerequisite: Faculty approval; application available in student services office.

HUMBIO 194. Honors. 1-10 Unit.
Completion of the honors project, normally taken in the student's final quarter. First component: the honors thesis, a final paper providing evidence of rigorous research, fully referenced, and written in an accepted scientific style. Second component: participation in the honors symposium, including a 10-minute oral presentation followed by a brief question and answer session. Prerequisites: 193 or 199, and acceptance into the honors program.

HUMBIO 197. Human Biology Internship. 1-4 Unit.
Limited to and required of Human Biology majors. A supervised field, community, or lab experience of student's choosing, pre-approved by Human Biology faculty and student advisers, and initiated at least three quarters prior to graduation. Participation in a poster session on the internship experience is required during the first quarter that the student is in residence at Stanford after completion of the internship. May be repeated for credit and a total of 4 units accumulatively. Prerequisite: Human Biology core.

HUMBIO 198. Senior Tutorial in Human Biology. 1-5 Unit.
Reading for Human Biology majors in exceptional circumstances and under sponsorship of Human Biology associated faculty. Students must apply through Human Biology student services before registering. Reading list, paper, and evaluation required. May be repeated for credit.

HUMBIO 199. Directed Reading/Special Projects. 1-4 Unit.
Human Biology majors must obtain a sponsor from the Human Biology associated faculty or the Academic Council. Non-majors and students who have not declared must obtain a sponsor only from the Human Biology associated faculty. Students must complete application in student services office.

HUMBIO 200. Teaching of Human Biology. 1-5 Unit.
For upper division undergraduates and graduate students. Practical experience in teaching Human Biology or serving as an assistant in a lecture course. May be repeated for credit.