

# PROGRAM IN HUMAN BIOLOGY

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Courses given in Program in Human Biology have the subject code HUMBIO. For a complete list of subject codes, see Appendix B

The Program in Human Biology is an interschool, interdepartmental, undergraduate major. It provides an interdisciplinary perspective on the relationship between the biological and social aspects of humanity's origin, development, and prospects.

The program has three goals:

1. To provide a broad and rigorous introduction to the biological and behavioral sciences and their interrelationships.
2. To relate these sciences to the problems raised by the relationships of human beings to one another and to their environment.
3. To help each student achieve a high level of understanding by focusing on one aspect of the biological and behavioral sciences, and its application.

The Human Biology curriculum draws on faculty from diverse University departments and schools. To complete the requirements for the major, students must take courses from the offerings of the program and from the listings of other University departments. The program culminates in a B.A. in Human Biology.

Human Biology majors are well prepared for advanced training in professional schools (for example, Education, Law, Medicine, Public Policy) and graduate programs in the behavioral, natural, and social sciences, depending on their choice of upper-division courses. Undergraduates in Human Biology often enter coterminal master's degree programs in a number of other University departments.

Additional information about the major may be obtained from the program's offices or the web site at <http://www.stanford.edu/dept/humbio>.

## UNDERGRADUATE PROGRAMS

### BACHELOR OF ARTS

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

1. **Fundamental Program:** at least 38 units, to include
  - Human Biology Core (30 units)
  - Statistics (4-5 units)
  - Internship (HUMBIO 197; 4 units)

The Human Biology Core refers to HUMBIO 2A and 2B, 3A and 3B, and 4A and 4B. See "Required Courses" below for more information.

HUMBIO 4B fulfills the policy requirement of the major. Other courses which satisfy the policy requirement may be obtained from the program office. A course used to fulfill the program's policy requirement may not be used in the student's foundation or area of concentration or as one of the three required upper-division courses.

Statistics may be selected from: STATS 60 or 141, PSYCH 10, ECON 102A, EDUC 160X, or BIOSCI 141.

The core and a statistics course must be taken for a grade by majors.

The internship requirement, an independent field experience project, is graded satisfactory/no credit only.
2. **Foundation Courses:** 20-unit minimum. Total units vary, depending on the focus of study selected by the student for the area of concentration. They may include practicums, labs, and introductory-level courses from across the University. A maximum of 10 premed units (from the chemistry, physics, and calculus series, and biology lab courses) and 4 research units are allowed.
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 must be numbered 100 or above. Three or more departments must be represented in the concentration. Each course must be taken for a minimum of 3 units. Final approval of the concentration rests with the student advisers and faculty adviser. All area of concentration courses must be taken for a grade. Examples of numerous possible areas of concentration are available in the Human Biology Student Handbook.
4. **Upper-Division Courses:** students must take three Human Biology upper-division courses numbered 100 to 189. Students are expected to enroll in courses outside of the area of concentration for breadth. Lab courses cannot be used to fulfill the upper-division requirement. One upper-division course may be taken satisfactory/no credit. Each course must be taken for a minimum of 3 units. All non-laboratory advanced courses (those numbered 100 to 189) fulfill the Human Biology upper-division requirement, including those that say "enroll in" another department.

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 brief written statement of academic and long-term goals and a proposed roster of courses satisfying the requirements for the major. The proposal is reviewed by the student adviser.

ers who then help identify an appropriate faculty adviser. Final approval of the proposed course of study rests with the faculty adviser. There are three specialized upper-division tracks offered within the program: Health Policy, Human Health and Performance, and Environmental Policy. Students with interests in these programs should contact the appropriate coordinator.

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.

## MINORS

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 we know of the biological with an understanding of the social and cultural setting in which they exist. Students with a minor in Human Biology will have a strong background in the integration between the biological and social aspects of humans.

To minor in Human Biology, students must take the core curriculum (HUMBIO 2A, 2B, 3A, 3B, 4A, and 4B) and one additional upper-division course (for example, any course offering by Human Biology with a number over 100, including courses cross-listed with other departments or programs). These must be taken for a minimum letter grade of 'C-'. Courses that count towards the fulfillment of major requirements may not be counted towards the minor.

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 the Autumn Quarter to graduate the following Spring Quarter).

## HONORS PROGRAM

The honors program in Human Biology affords 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 once they have completed the Human Biology core, have an overall Stanford grade point average (GPA) of 3.0, and meet other requirements detailed in the honors handbook. Interested students should consult resources in the Human Biology office including the Human Biology Honors Handbook, the honors program application available from the student services office, and appointments during office hours with the Human Biology honors chair.

Specific courses of interest to honors students include: HUMBIO 160B, Senior Honors Colloquium in Social and Policy Research, HUMBIO 190 Honors Seminar for Sophomores, HUMBIO 191 Honors Seminar for Juniors, HUMBIO 193 Research in Human Biology, and HUMBIO 194 Honors. Most honors projects involve a total of 10 to 15 units of course work in HUMBIO 193 and 194.

Admission to the honors program is by application, normally between mid-April of the junior year and mid-October of the senior year. Students planning to conduct honors research are encouraged to attend the Honors Seminar for Juniors (HUMBIO 191) and to begin research or preparation during their junior year. An Honors College is held for a select number of senior honor students just prior to Autumn Quarter each year. For applications, contact the program office. The honors thesis is normally completed by the middle of Spring Quarter of the senior year. Each honors student then presents a brief summary of honors research at the Human Biology Honors Symposium in May.

## COURSES

(WIM) indicates that the course satisfies the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

The faculty and staff of Human Biology prepare a student handbook, on the web at <http://www.stanford.edu/dept/humbio/>, that provides a detailed description of the Human Biology major and outlines possible areas of concentration. It reflects the most up-to-date information for the academic year and is the definitive guide for all Human Biology majors.

## REQUIRED CORE

Required Core sequences (2A and 2B, 3A and 3B, and 4A and 4B) 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 and take the core in sequence. Students should initiate the core in Autumn Quarter of the sophomore year. Any deviation from the core sequence is highly discouraged and must first be approved by the program chair through a petition process by the second week of that quarter to which the petition pertains. Freshmen are not permitted to enroll. Majors must take the core courses for a minimum letter grade of 'C'.

### 2A,B. Genetics, Evolution, and Ecology: Culture, Evolution, and Society

**HUMBIO 2A. Genetics, Evolution, and Ecology**—Introduction to the basic principles of classical and modern genetics, evolutionary theory, and population biology. Topics: micro- and macro-evolution, population and molecular genetics, population dynamics, and community ecology, emphasizing the genetics of the evolutionary process and applications to human populations. GER:2a

5 units, Aut (*Durham*)

**HUMBIO 2B. Culture, Evolution, and Society**—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. GER:3b

5 units, Aut (*Klein*)

### 3A,B. Cell Biology and Developmental Biology: Biology and Culture in Human Development

**HUMBIO 3A. Cell and Developmental Biology**—The basic principles of the biology of cells: the principles of human developmental biology, the 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, immunology, and drug addiction. GER:2a

5 units, Win (*Ferrell*)

**HUMBIO 3B. The Human Predicament**—The relationship of the biological sciences to public policy in resource management and conservation practices, the regulation of environmental and health risks, agricultural production, the delivery of health services, the protection of biodiversity, and global climate change. Assigned policy challenges in lectures and section meetings. Readings on actual cases. GER:3b(WIM)

5 units, Win (*Boggs*)

### 4A,B. The Human Organism: The Human Predicament

**HUMBIO 4A. The Human Organism**—Organ system physiology, beginning with the basic principles of neurobiology and endocrinology, and the functions of body organs. The mechanisms of control, regulation, and integration of organ systems function. GER:2a

5 units, Spr (*R. Fernald, Heller*)

**HUMBIO 4B. Biology and Culture in Human Development**—Introduction to the research and theory on early human development. How psychobiological factors shape the developing child, and how cultural practices shape the environments of childhood and influence human cognitions, emotions, moral judgments, relationships, and social behavior from birth through adolescence. GER:3b

5 units, Spr (*A. Fernald*)

## ADDITIONAL INTRODUCTORY OFFERINGS

**HUMBIO 2S,3S,4S. Bioethics**—Year-long introductory series on the social, ethical, philosophical, and religious issues associated with advances in biomedical science. Guest speakers with discussion format. Designed to parallel the Human Biology core sequence, but may be taken independently of the core. Each of series is different and may be taken in any sequence or as single courses. 1 unit S/NC, 2 units with weekly discussion section. See <http://www.stanford.edu/class/bioethics>.

**HUMBIO 2S. Bioethics**—Topics: ethics and human origins, the Human Genome project, genetic screening and eugenics, genetic engineering, beauty and disgust as agents of evolution, religion in the age of Darwinism, and evolution and the future of humanity.

*1-2 units, Aut (Hurlbut)*

**HUMBIO 3S. Bioethics**—Topics: in vitro fertilization, intrauterine surgery, growth hormone, cosmetic surgery, the nature of desire and sexuality, anorexia nervosa, cloning and human stem cells, natural aging and extending the lifespan.

*1-2 units, Win (Hurlbut)*

**HUMBIO 4S. Bioethics**—Topics: terraforming Mars, psychophysiology of space travel, computer mediated surgery, virtual reality, ecology and human disease, global warming, and biowarfare.

*1-2 units, Spr (Hurlbut)*

**HUMBIO 3Y. Practicum in Child Development**—Practicum experience at Bing Nursery School for 3.5 hours/week. Must be taken concurrently or subsequent to 3B. (AU)

*1 unit, Win (A. Fernald, Hartman)*

**HUMBIO 5. The Biology and Evolution of Language**—(Enroll in ANTHSCI 5.)

*4-5 units (Fox) not given 2002-03*

**HUMBIO 6. Human Origins**—(Enroll in ANTHSCI 6.)

*5 units, Win (Weaver)*

**HUMBIO 11. Sleep and Dreams**—Multimedia. Current research on how sleep affects our daily lives. Topics: the physiology of non-REM and REM sleep, dreams and dreaming, content, psychophysiological cause, lucid dreaming; sleep need, sleep debt, daytime alertness, and performance; biological clock and circadian rhythms; sleep disorders, insomnia, narcolepsy, sleep apnea, sleepwalking, jet lag, sleeping pills, sleep and mental illness, sleep and memory, the impact of sleep deprivation and sleep disorders on academic performance and social life.

*3 units, Win (Dement)*

**HUMBIO 13. The Emergence of Modern Medicine**—(Enroll in HISTORY 13.)

*5 units (Findlen) not given 2002-03*

**HUMBIO 14. Science, Technology, and Art: The Worlds of Leonardo**—(Enroll in HISTORY 14, STS 102.)

*5 units, Aut (Gorman)*

**HUMBIO 20. Drug Development**—Dialogue with representatives from academia and leading pharmaceutical and biotech companies. From ideas to medical therapies (conception, clinical trials, and marketing of new pharmaceuticals). Topics: academic versus industrial research, clinical trials, FDA approval process, role of biotechnology in drug development, marketing, and business development of drugs. (AU)

*1 unit, Spr (Staff)*

**HUMBIO 27. Traditional Chinese Medicine**—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.

*1 unit, Spr (Golianu)*

**HUMBIO 60. Population Studies**—(Enroll in BIOSCI 146.)

*1 unit, Win (Feldman)*

**HUMBIO 61. Introduction to Philosophy of Science**—(Enroll in PHIL 60, HPS 60.)

*5 units, Spr (Godfrey-Smith)*

## STANFORD INTRODUCTORY SEMINARS

**HUMBIO 91Q. Neuroethology: The Neural Control of Behavior**—Stanford Introductory Seminar. Preference to sophomores. Animal behavior offers insights about evolutionary adaptations. The origins of the study of animal behavior and its development to the present. Discussion of original research papers. The use and misuse of parallels between animal and human behavior. Possible field trip to observe animals in their natural habitat.

*3 units, Aut (R. Fernald)*

**HUMBIO 92Q. International Women's Health and Human Rights**—Stanford Introductory Seminar. Preference to sophomores. Focus is on women in poorer countries. Issues include women's status, poverty, violence, and unequal access to education, food, and health care. Maternal mortality, sexually transmitted diseases, refugee situations, traditional practices affecting women's and girls' health, trafficking and prostitution, and women's roles as they age. Readings include materials from women's organizations outside the U.S.

*3 units, Win (Firth-Murray)*

**HUMBIO 94Q. The Nation's Health**—Stanford Introductory Seminar. Preference to sophomores. Overview of the nation's health. Topics: trends in healthy populations; determinants of health; health policy; values, ethics, and ideology; politics of health; public health and clinical preventive services; the collaboration of medicine and public health; the health care system; Medicare and Medicaid; medical markets and managed care; and quality of care. Weekly presentations by students. Enrollment limited to 15.

*3 units, Aut (Heller, Lee)*

**HUMBIO 95Q. Science-in-Fiction is not Science Fiction**—(Enroll in CHEM 25Q.) Stanford Introductory Seminar.

*2 units, Win (Djerassi)*

**HUMBIO 96Q. Guilt and Shame: Multidisciplinary Perspectives**—Stanford Introductory Seminar. Preference to sophomores. The experience of guilt and shame from the perspective of the individual. The development of the sense of guilt in childhood; behaviors commonly associated with guilt; its role in interpersonal relationships; communal interactions; psychopathology and crosscultural and gender differences. Conceptions of guilt and shame from the perspectives of major religious and philosophical traditions, and recent interpretations from evolutionary psychology.

*3 units, Win (Katchadourian)*

**HUMBIO 97Q. Sport, Exercise, and Health: Exploring Sports Medicine**—Sports medicine is the practice of clinical medicine at the interface between health and performance, at the boundary between 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 provided to the broader community. Topics covered in this seminar include sports injuries, medical conditions associated with sport and exercise, ethics, coaching, women's issues, fitness and health, and sports science. Case studies.

*3 units, Win (Matheson)*

## ADVANCED

Open to non-majors with the proper prerequisites. Human Biology majors have preference when enrollment is restricted. All classes listed here fulfill the Human Biology upper-division requirement, including those that say "enroll in" another department.

**HUMBIO 102A,B. Children, Youth, and the Law**—The legal rights of children and adolescents in the U.S. and how those rights are defined, protected, and enforced through the legal process within the context of the developmental needs of children and youth and competing societal interests. Topics: the origins and definitions of children's rights; adoption; custody; the juvenile justice system (abused, neglected, and dependent children, status offenders such as runaways and truants, and minors accused of crimes); education; informed consent; health care; protection from harm and child welfare; due process; privacy, freedom of expression, and exercise of First Amendment rights. Interactive, using hypotheticals for discussion and analysis. Companion to 102B, and alternates every other year; students may take one, or both.

**A:** 5 units, *Win (Abrams) alternate years, not given 2003-04*

**B:** 5 units (*Abrams) alternate years, given 2003-04*

**HUMBIO 103. Parasites/Pestilence: Infectious Public Health Challenges**—(Same as MI 103.) Parasitic and other diseases with public health impact. Pathogenesis, clinical syndromes, complex life cycles, and the interplay among environment, vectors, hosts, and reservoirs in historical context to understand public health policy approaches to halting disease transmission. Focus is on WHO TDR (World Health Organization Tropical Disease Research) targeted disease entities: river blindness (onchocerciasis), sleeping sickness (African Trypanosomiasis), leishmaniasis, schistosomiasis, mycobacterial disease (tuberculosis and leprosy), malaria, toxoplasmosis, dracunculiasis, intestinal helminthes, and miscellaneous and emerging infections. Guest lecturers and experts in disease control and research of local and international renown. Problem sets, exams, and original proposal to solve a current disease.

3 units, *Spr (Smith)*

**HUMBIO 104. Aging: From Biology to Social Policy**—(Enroll in ANTHSCI 171.)

5 units, *Spr (Barnett)*

**HUMBIO 105. Bioethics and Anthropology**—(Enroll in ANTHSCI 174.)

5 units (*Koenig) not given 2002-03*

**HUMBIO 107. Astrobiology and Space Exploration**—Evolution is cast against space and time, focusing on the emergence of life, intelligence, and civilization on Earth and, possibly, elsewhere. The phenomenon of human space exploration and the biological, psychological, sociological, and ultimately, philosophical issues that emerge. Integrates information from astrophysics, biochemistry, chemistry, evolutionary biology, geology, paleontology, physiology, psychology, and sociology. Taught by scientists from NASA Ames Research Center. Enrollment limited to 30. Prerequisite: one year college-level mathematics, physics, chemistry, biology, or psychology.

3 units, *Spr (Cohen)*

**HUMBIO 109. Human Behavioral Biology**—(Enroll in BIOSCI 150.)

2-6 units (*Sapolsky) alternate years, given 2003-04*

**HUMBIO 110. Vertebrate Biology**—The evolution, form, function, and behavior of the vertebrates, from primitive fishes to birds and mammals, including humans. Prerequisite: Biological Sciences or Human Biology core.

3-4 units, *Spr (Porzig) alternate years, not given 2003-04*

**HUMBIO 110L. Vertebrate Biology Lab**—Comparative anatomy structure of the vertebrates, with emphasis on osteology. Representatives of each of the seven vertebrate classes are available in lab. Review labs and field trips. Prerequisites: current or previous enrollment in 110.

3 units (*Porzig) not given 2002-03*

**HUMBIO 111. Human Physiology**—(Enroll in BIOSCI 112.)

4 units (*Baker) alternate years, given 2003-04*

**HUMBIO 112. Hormones and Behavior**—(Enroll in ANTHSCI 132.)

5 units, *Spr (Maggioncalda)*

**HUMBIO 114. The Human Genome**—(Same as BIOSCI 109.)

3 units, *Spr (Heller, Kumm) not given 2002-03*

**HUMBIO 115A. Humans and Viruses**—(Same as MI 115A.) Overview of human virology. Topics illustrate concepts in biology and the social sciences, focusing on emerging infections, viral classification, transmission and prevention, vaccination and treatment, eradication of disease, viral pathogenesis, mechanisms of virally-induced cancer, and viral evolution. Topics: molecular biology of genetic shift and drift in influenza virus, cellular tropism of HIV, developmental biology of virally-induced birth defects, clinical aspects of infantile diarrhea, social aspects of the common cold, policy issues of blood antibody tests, factors in pathogenesis and transmission of prions. Prerequisites: Human Biology core or consent of instructor.

4-6 units, *Win (Siegel)*

**HUMBIO 115B. The Vaccine Revolution**—(Same as MI 115B.) Advanced seminar. The human aspects of viral disease, focusing on recent discoveries, especially in the area of vaccine development and emerging infections. Journal club format: students select articles from primary scientific literature, write formal summaries, and synthesize it into a literature review on a specific topic. Emphasis is on the development of critical reading, analysis, experimental design, and interpretation of data. Students give four oral presentations and lead discussions based on their scientific journal reading. Enrollment limited to 10. Prerequisite: 115A.

3-6 units, *Spr (Siegel) alternate years, not given 2003-04*

**HUMBIO 116. Eye and Implications of Vision**—The basic physiology of vision and how visual capabilities influence human endeavors. Topics: mechanisms of vision, vision in animals, illusions, visual physiology of art, the eye in history and literature, vision in sports. Student participation, oral presentations, and a written thesis. Prerequisite: interest in mechanisms of vision and the humanities.

3 units, *Win (Marmor) given 2003-04*

**HUMBIO 117. Policy and Research in Science Education**—Controversial topics in science education such as the teaching of evolution, national standards and tests, gender bias, text selection, recruiting and retraining qualified teachers, and the goals of science teaching for different populations. The substance and style of formulating policy for science education in the U.S., now and in the recent past. Issues for local, state, and federal authorities; appropriate government roles in the selection of content, improvement of teaching, and research. Primary, secondary, and undergraduate programs; and the use of museums and media in programs to improve science education. International comparisons where appropriate. Enrollment limited to 20.

3 units, *Spr (Atkin, Coffey)*

**HUMBIO 118. Human Diversity: A Linguistic Perspective**—The diversity and distribution of human language and its implications for the origin and evolution of the human species. The origin of existing languages and the people who speak them. Where did the languages that we currently see in the world come from and how can this diversity be used to study human prehistory? Evidence from related fields (archaeology and human genetics). Topics: the origin of the Indo-European languages, the peopling of the Americas, and the evidence that all human languages share a common origin. GER:4a

3 units, *Spr (Ruhlen)*

**HUMBIO 119. Conservation Biology**—(Same as BIOSCI 144.) Introduction to the science of preserving biological diversity, its principles, policy, and application. Topics: biology of small populations, extinction, minimum viable population analysis, habitat fragmentation, reserve design and management, the Endangered Species Act, and conflict mediation. Case studies and local field trips. Four units for students who take the recommended field trips. Prerequisite: BIOSCI 43, HUMBIO 2A, or consent of instructor.

3-4 units (*Boggs, Launer) not given 2002-03*

**HUMBIO 120. Nutrition in Health and Human Performance**—Introduction to the science of human nutrition. The study of food, the nutrients, and the 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, race, ethnic, religious, and social economic diversity. The relationships between nutrition and disease; eating disorders; ethnic diets; vegetarianism; nutritional deficiencies; nutritional and ergogenic supplementation; phytochemicals; and food safety. Prerequisite: Human Biology core or consent of instructor.

3 units, Spr (Hudson)

**HUMBIO 121. Ethical Issues in the Neurosciences**—Multidisciplinary approach to the ethical questions raised by recent advances in the neurosciences. How these advances relate to medical therapy, social policy, and broader considerations of human nature (consciousness, free will, personal identity, and moral responsibility). Discussion format with leading research scientists, legal experts, philosophers, and theologians. Topics: neurogenetics, fetal brain tissue therapy, medicalization of criminal behavior, cosmetic psychopharmacology, and the neurobiological basis of love, sexuality, and gender. Enrollment limited to 15. Prerequisite: Human Biology core, Biological Sciences core, or consent of the instructor.

4-5 units, Spr (Hurlbut)

**HUMBIO 122. International Health Policy: Comparative National Health Care Systems**—The structure and underlying policies of national health care systems in Europe, N. America, and Japan. How other countries have addressed issues of organization, finance, and allocation of scarce health care resources. Limited enrollment. Prerequisites: Human Biology 160, consent of instructor.

3 units, Win (Lee, Heller)

**HUMBIO 123. Sexuality in Adolescence**—Current research on the sexual development of young people from a developmental perspective. Critical issues related to the scientific, historical, and cultural perceptions about adolescent sexuality; social influences on sexual development; sexual risk; and the limitations and future directions of research on adolescent sexuality. Sexual identity and behavior, sexually transmitted diseases including HIV, pregnancy, abortion, gay and lesbian youth, sex education and condom availability in schools, the impact of the mass media, sexual activity that is exploitative, and the difficulties and limitations in studying adolescent sexuality. Legal and policy issues, gender differences, and international and historical trends. Texts analyze sexual issues and choices confronting adolescents; current research. Research project, including original data collection about some aspect of adolescent sexuality. GER:4c

3 units, Spr (Brown) not given 2003-04

**HUMBIO 124. Neural Basis of Sleep and Circadian Rhythms**—(Enroll in BIOSCI 149.)

4 units, Win (Heller, Franken, O'Hara, Ruby)  
alternate years, not given 2003-04

**HUMBIO 125. Environmental Policy and Law**—The role of government and citizens in formulating, implementing, and enforcing environmental policy. Using case studies, background readings, law cases, and statutes, seminar investigates the formal and informal political mechanisms involved in controlling pollution and protecting the environment. Topics: the respective roles of courts, legislatures, executive agencies, and nongovernmental organizations in shaping U.S. environmental policy. The pros and cons of regulatory and economic approaches to pollution control; environmental politics and ethics; air and water pollution; environmental justice; toxic substances and risk assessment; economics and trade; hazardous wastes.

5 units, Spr (Rosencranz)

**HUMBIO 126. Adolescent Development**—Adolescence from sociological, psychological, and psychiatric perspectives. Topics: physical, physiological, and cognitive development; identity; peer group; parent/child relations; impact of school; vocational development; and problem outcomes (eating disorders, violence, and teen pregnancy). Prerequisite: 3B or PSYCH 1, or consent of instructor.

4 units, Win (S. Feldman)

**HUMBIO 127. Seminar on Conducting Research**—For juniors preparing to undertake honors research in their senior year. Small groups jointly design, conduct, analyze, and write up original research. Teaches research-related skills including how to design a survey, enter data on a computer, and data analysis. Enrollment limited to 12. Pre- or corequisite: PSYCH 10 or equivalent, or consent of instructor.

4 units, Aut (S. Feldman)

**HUMBIO 129. Ethnicity and Medicine Lecture Series**

3 units, Spr (Garcia)

**HUMBIO 130. Adam 2000: Images of Human Life in the Age of Biomedical Technology**—Interdisciplinary approach to the social, moral, and aesthetic values which guide the use of biomedical technology. How advances in biology are reshaping our relationship with nature, attitudes toward the body, and ideas about the meaning and purpose of human life. Topics: the use of medical technology to alter appearance and enhance performance, fetal tissue transplantation, biotherapy for criminal behavior, treatment of aging as a disease, and alteration of the body for space travel. Lecture/discussion format with guests from the scientific and religious communities. Limited enrollment. Prerequisites: Human Biology or Biological Sciences core, or consent of the instructor.

3-4 units, Win (Hurlbut)

**HUMBIO 131. Natural Resources Policy**—Focus is on federal public land and natural resources policy; mining, timber, and grazing law and policy; the legal aspects of forest, range, park, wilderness, wetlands, and wildlife management; recreation and preservation; and related issues. The role of the courts, administrative discretion, the Endangered Species Act, and the tension between protecting resources and respecting property rights. Students research one aspect of law and policy governing the management of natural resources.

5 units, Aut (Rosencranz)

**HUMBIO 132. Seminar on Problem Behavior in Adolescence**—Lecture/seminar. Aspects of adolescent problem behavior, including risk; and protective factors, treatments, and intervention programs designed to ameliorate or prevent these problems. Externalizing behaviors (violence, delinquency, drug abuse, risk taking), internalizing problems (depression, eating disorders, suicide), and sexuality-related problems (teen pregnancy, date violence, STDs/HIV). Enrollment limited to 20. Prerequisite: 126 or consent of instructor.

4 units, Spr (S. Feldman)

**HUMBIO 133C. Human Evolutionary Anatomy**—(Enroll in ANTHSCI 133C.)

5 units, Spr (Weaver)

**HUMBIO 134. Ecological Anthropology**—(Enroll in ANTHSCI 164.)

3-5 units (Staff) not given 2002-03

**HUMBIO 135. Global Environmental Policy**—(Enroll in INTNLREL 134.)

5 units, Aut (Rosencranz)

**HUMBIO 136. Conservation and Community Development in the Amazon**—(Same as ANTHSCI 161A.) The prospects for achieving the dual goals of biodiversity conservation and community development in Amazonia. Case studies of recent efforts at biodiversity conservation, including national parks, biosphere reserves, pharmaceutical prospecting, ecotourism, extractive reserves, and agroforestry projects. The costs and benefits of conservation. To whom do these costs and benefits

accrue? Critically evaluates Integrated Conservation-Development Projects (ICDPs) in the Amazon today. Optional field trip over Spring Break (at added expense, limited capacity) to selected ICDPs in the Peruvian Amazon.

*5 units (Durham) not given 2002-03*

**HUMBIO 137. Demography of Humans and Other Species**—(Same as BIOSCI 102.) The past century has seen enormous demographic change around the world, from fertility transitions to aging. Methods and applications of demography. Methods include demographic measures and estimates; mortality and lifetables; fertility and marriage; population projection or humans and other species. Applications include study of trends and patterns in human mortality and fertility; the life cycle perspective; development, human capital, and inequality; aging and public pensions; using and interpreting population projections. Prerequisites: Calculus and basic statistics, or consent of instructor.

*3 units, Aut (Tuljapurkar)*

**HUMBIO 139. Primate Societies**—(Enroll in ANTHSCI 131B.)

*5 units, Spr (Maggioncalda)*

**HUMBIO 140. Social Class, Race/Ethnicity, Health**—(Enroll in SOC 141A.)

*3 units, Win (Barr)*

**HUMBIO 141. Race, Poverty, and the Environment**—Seminar on environmental conditions and disproportionate environmental impacts in poor and minority communities in the U.S., correlating race, ethnicity, and income to exposure to environmental and public health hazards. Case studies on migrant workers and Native American subsistence fishers.

*5 units (Rosencranz) not given 2002-03*

**HUMBIO 142C. Alternative Spring Break: AIDS and HIV in San Francisco**

*1 unit, Win (Siegel)*

**HUMBIO 142G. Post Field Seminar: A Practical Next Step for Students Returning from Abroad**—For students who have recently worked abroad for two months or longer. A forum for students to share their experiences and what they learned through their international research, internship, or volunteer work. A lecture component connects international experiences with at-home activism and helps students explore directions for future work, either domestically or internationally, that builds on their experiences abroad. Students create a final product to benefit the community in which they worked and/or be used as an educational tool locally. Focus is on a practical next step for students interested in international development and related fields.

*1 unit, Aut (Siegel)*

**HUMBIO 143. Globalization, Labor, and the Environment**—Interdisciplinary. The responsibility of multinational corporations and institutions (World Bank, WTO, IMF) in the global economy, emphasizing labor and environmental standards in developing countries. Local and global case studies and research focus on social justice and empowerment for domestic and foreign victims of labor, environmental and human rights abuses, the role of certain multinational institutions and corporations in those abuses, and potential tools for holding these bodies more accountable. Service-learning component with Bay Area organizations.

*4 units, Win (Rosencranz)*

**HUMBIO 145. Children's Citizenship: Justice Across Generations**—(Enroll in POLISCI 131.)

*5 units, Aut (Reich)*

**HUMBIO 147. Controlling Climate Change in the 21st Century**—(Enroll in EARTHSYS 147, BIOSCI 147.)

*3 units, Spr (Schneider, Rosencranz)*

**HUMBIO 151. The Rise of Scientific Medicine**—(Enroll in HISTORY 33A.)

*4-5 units (Lenoir) not given 2002-03*

**HUMBIO 152. Environmental Policies and Institutions in Developing Countries**—(Same as ANTHSCI 152.) The tension between environmental protection and economic growth in: Egypt, Russia (Siberia), China, India, Indonesia, Nigeria, Mexico, and Ecuador. Each student is responsible for an environmental profile of a chosen developing country.

*5 units (Rosencranz) not given 2002-03*

**HUMBIO 155. Exercise Physiology**—Overview of human exercise physiology. Focus is on how body systems respond to the stress of acute exercise and how those systems adapt to chronic exercise training. Topics: how the cardiovascular system adapts to optimize oxygen delivery and utilization, how muscles generate force and how they hypertrophy in response to training, how metabolic pathways are regulated to support the increased energy demand of exercise, theories on the causes of fatigue and muscle soreness, and theories on what limits human performance. How exercise capacity is influenced by aging, gender, and environmental conditions, e.g., high altitude, heat, and cold. Prerequisite: Human Biology core or consent of instructor.

*4 units, Aut (Friedlander)*

**HUMBIO 155S. Applied Topics in Exercise Physiology and Metabolism**—In-depth investigation of the physiology and metabolism underlying student selected topics in exercise physiology. Emphasis is on critical reading of scientific research. Student presentations, assigned readings, discussions. Summary paper. Enrollment limited to 12. Prerequisites: 155, consent of instructor.

*3 units, Spr (Friedlander)*

**HUMBIO 156. Human Development: Biological, Medical, and Social Aspects**—The biological, medical, and social aspects of normal and abnormal human development. Topics: in vitro fertilization and embryo transfer; gene and cell therapy; gametogenesis; pattern formation in the nervous system and limb development; gene and grand multiple pregnancies; prematurity, in utero effects of teratogens; sex determination and differentiation; growth control; gigantism and dwarfism; neural tube defects; cardiac morphogenesis; progress in the developmental biology of humans. Limited enrollment. Prerequisites: Human Biology or Biological Sciences core, or consent of instructor.

*3-4 units, Win (Porzig)*

**HUMBIO 157. Human Ecology of the Amazon**—(Enroll in ANTHSCI 161B.) Ecosystems of the Amazon and their human inhabitants. The biotic and abiotic factors shaping human adaptation to the region. Ethnographic literature is used to explore subsistence patterns and the resource use of Native Amazonians. Current changes in these economics and lifeways due to acculturation and market forces, and the implications for conservation.

*5 units, Win (Irvine, Lu Holt)*

**HUMBIO 159. Sports Medicine**—The themes of sports, exercise, health, and medicine are integrated throughout the entire human performance continuum, from the use of exercise as a form of therapy to the injuries and illnesses that result from sports and exercise. Content in the basic and applied sciences is from physiology, nutrition, psychology, and biomechanics. Medical topics in the problems exacerbated or caused by exercise and sport; maximizing performance in elite athletes; and population-based issues such as exercise and its relationship to health, women's issues, drugs in sport, and exercise and aging. Prerequisite: medical school enrollment, upper-division Human Biology standing, or consent of instructor.

*4 units, Win (Matheson)*

**HUMBIO 160. Health Care in America: The Organizations and Institutions that Shape Our Health Care System**—Overview of the health care system in the U.S., examining several key organizations and institutions that shape health policy and health care delivery. By understanding the forces that affect health and health care, students assess more critically options for health care reform.

*3 units, Win (Barr)*

**HUMBIO 160A. American Health Policy**—Key issues surrounding health care reform, and the policy making process as it pertains to health care. Student presentations of assigned readings, followed by discussion. Prerequisites: 160, consent of instructor.

*3 units, Spr (Barr)*

**HUMBIO 160B. Senior Honors Colloquium in Health Policy**—(Same as SOC 201H.) Limited to students doing senior honors research in either Human Biology or Sociology. Year-long class to assist students doing honors research pertaining to sociology or social policy. Weekly discussions center around defining the research question, identifying data acquisition methods, carrying out data analysis, and writing the honors thesis. Prerequisite: consent of instructor.

*1 unit, Win, Spr (Barr, Heller, Lee)*

**HUMBIO 160W. Seminar in Federal Health and Environment Programs/Agencies**—Priority enrollment for students going to Stanford in Washington, Winter Quarter. Introduces health policy making in Washington, D.C., with an emphasis on understanding the agencies within the federal government responsible for developing and carrying out health policy. Weekly lectures/discussions. Enrollment limited to 25.

*3 units, Aut (Lee)*

**HUMBIO 162. Primate Evolution**—(Enroll in ANTHSCI 131A.)

*5 units (Staff)*

**HUMBIO 165. Environmental Justice in the U.S.**—(Enroll in ANTHSCI 168B.)

*5 units, Win (Kosek)*

**HUMBIO 166. Evolution of Primate Intelligence**—(Same as ANTHSCI 131C.) Upper level seminar. Evolution of cognitive abilities in primates. Selective forces increasing intelligence from ecological factors impacting early prosimian primates to social and cultural factors affecting hominid evolution. Hypotheses about relationships between brain morphology and intelligence in humans, nonhuman primates, and hominid ancestors. Prerequisite: ANTHSCI 131B or consent of instructor.

*3 units, Win (Maggioncalda)*

**HUMBIO 167. International Health**—Introduction to concepts of health and wellness and the major descriptors and determinants of health status, international organizations and control programs, disease-related problems within population groups from an epidemiologic viewpoint, health care delivery methods, efforts to improve health through examination of programs and projects currently underway and previously implemented. Emphasis is on the cultural, economic, and political contexts in international health. Prerequisites: Human Biology core or consent of instructor.

*4 units, Spr (Wang)*

**HUMBIO 169. Critical Issues in International Women's Health**—Overview of international women's health issues in the context of a woman's life, 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 their capacity to negotiate and/or feel empowered, including maternal mortality, violence, HIV/AIDS, access to abortion, and sex trafficking. Information about organizations addressing these issues.

*4 units, Aut (Firth-Murray)*

**HUMBIO 170. Social Policy for Sustainable Resource Use**—(Enroll in ANTHSCI 167.)

*5 units (Irvine) not given 2003-04*

**HUMBIO 171. Indigenous Peoples and Environmental Problems**—(Enroll in ANTHSCI 162.)

*3-5 units (Durham, Irvine) given 2003-04*

**HUMBIO 172. Indigenous Forest Management**—(Enroll in ANTHSCI 166A.)

*5 units, Aut (Irvine)*

**HUMBIO 173. Medical Ethics**—(Enroll in PHIL 78.)

*4 units, Win (Jaworska)*

**HUMBIO 174. Ethics and Politics in Public Service**—(Enroll in POLISCI 133.)

*5 units, Spr (Reich)*

**HUMBIO 175. Health Care as Seen Through Medical History, Literature, and the Arts**—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, mental illness, sick children, death and dying.

*4 units, Aut (Zaroff)*

**HUMBIO 177. Skeletal Development and Evolution**—(Enroll in ME280.)

*3 units, Spr (Carter)*

**HUMBIO 180. Beginning Osteology**—(Same as ANTHSCI 133A.) Introduction to the study of human skeletal remains. Basic bone nomenclature, biology and anatomy, growth and development, and methods for assessing age and sex. Emphasis is on hands-on study and identification of human skeletal material.

*5 units, Aut (Weaver)*

**HUMBIO 180G. Introduction to Anthropological Genetics**—(Enroll in ANTHSCI 180.)

*5 units, Win (DeGusta)*

**HUMBIO 183. Hunter-Gatherers in Archaeological Perspective**—(Enroll in ANTHSCI 141.)

*5 units, Win (Rick, Steele)*

**HUMBIO 184. The Darwinian Revolution**—(Enroll in HISTORY 133.)

*4 units, Aut (Lenoir)*

**HUMBIO 185. Science and Religion**—(Enroll in RELIGST 270.)

*4 units (Bergman, Eisen) not given 2002-03*

**HUMBIO 189. Philosophy of Biology**—(Enroll in PHIL 167A.)

*4 units, not given 2002-03*

## HONORS, INTERNSHIP, AND SPECIAL PROJECTS

**HUMBIO 190. Honors Seminar for Sophomores**—Introduction to the process of doing honors research and writing the final thesis. Guest speakers discuss various aspects of honors research. Students attend at least one of the Honors Symposium presentations in May. Prerequisite: consent of instructor. (AU)

*1 unit, Spr (R. Fernald)*

**HUMBIO 191. Honors Seminar for Juniors**—Open to juniors considering honors work in Human Biology. Weekly survey of faculty research areas. Writing honors proposals, research grant applications, and Human Subjects Committee approval. Speakers include honors students, faculty, and statistical and writing consultants. (AU)

*1 unit, Win (Feldman)*

**HUMBIO 193. Research in Human Biology**—Independent research conducted under faculty supervision, taken junior or senior year, normally (but not necessarily) in pursuit of an honors project. May be repeated for credit. Students must complete application in student services office.

*1-5 units, Aut, Win, Spr*

**HUMBIO 194. Honors**—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.

*1-10 units, Aut, Win, Spr*

**HUMBIO 197. Human Biology Internship**—Limited to and required of Human Biology majors. Combines course work with a supervised field, community, or lab experience of student's choosing. Must be pre-approved by Human Biology faculty adviser and student adviser before work begins, and initiated at least three quarters prior to graduation. Prerequisite: Human Biology Core.

*1-4 units, Aut, Win, Spr (Staff)*

**HUMBIO 197S. Service Learning Internship in Human Biology**—(Fulfills the Human Biology internship requirement.) Provides 100 hours of work in service capacity with a non-profit, community health agency. Students are required to go through an orientation to their community and participate in organized reflection activities throughout their experience. Prerequisite: consent of instructor and admittance into the Human Biology Service-Learning Program.

*1-4 units, Aut, Win, Spr (Barr)*

**HUMBIO 198. Senior Tutorial in Human Biology**—Intensive 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.

*1-5 units, Aut, Win, Spr (Staff)*

**HUMBIO 199. Directed Reading/Special Projects**—Independent study open to Human Biology majors and non-majors. Human Biology majors must obtain a sponsor from the Human Biology associated faculty or the academic council. Non-majors and/or students who have not declared must obtain a sponsor only from the Human Biology associated faculty. Students must complete application in student services office.

*1-4 units, Aut, Win, Spr (Staff)*

**HUMBIO 199L. Special Projects: The Death Penalty, Human Biology, Law, and Policy**—Combines academic study with direct student involvement. Students participate in forensic research and case investigation, including DNA evidence, psychological and physiological development, mental and physical disabilities, and witness interviews. The philosophy, structure, and application of capital punishment in the United States. Goal is to examine, understand, and challenge the various sides of the issues involved in the death penalty with the unique perspective of involvement in a real case. The course is not taught from any preconceived belief or with any political or philosophical agenda except to involve students in an intellectual challenge of policy and philosophy.

*3 units, Aut, Win, Spr (Abrams)*

**HUMBIO 200. Teaching of Human Biology**—For upper-division undergraduate and graduate students. Practical experience in teaching Human Biology or serving as an assistant in a lecture course.

*1-5 units, Aut, Win, Spr (Staff)*

## OVERSEAS STUDIES

Descriptions of these courses are in the "Overseas Studies" section of this bulletin or at the Overseas Studies office, 126 Sweet Hall. Students overseas are encouraged to participate in a wide range of internships and independent research as well.

### OXFORD

**HUMBIO 160X. Changing Health Care Delivery in Britain**

*4 units, Aut (Birch)*

### PARIS

**HUMBIO 116X. The Eye and Implications of Vision**

*4 units, Win (Marmor)*

**HUMBIO 153X. Health Systems and Health Insurance: France and the U.S., a Comparison across Space and Time**—(Same as PUBLPOL 111.)

*4-5 units, Win (Chaix-Couturier)*

### SANTIAGO

**HUMBIO 53X. Impact of Hormones on Daily Life**

*3 units, Aut (Feldman)*

**HUMBIO 106X. Man-Environment Interactions: Case Studies from Central Chile**—(Same as BIOSCI 106Z, LATINAM 122X.)

*5 units, Aut (Hajek)*

**HUMBIO 112X. Health, Hormones, and Disease**

*4 units, Aut (Feldman)*

This file has been excerpted from the *Stanford Bulletin*, 2002-03, pages 432-439. Every effort has been made to insure accuracy; late changes (after print publication of the bulletin) may have been made here. Contact the editor of the *Stanford Bulletin* via email at arod@stanford.edu with changes, corrections, updates, etc.