

Human Evolutionary Biology (EBH)**Major in Human Evolutionary Biology****Departments of Anthropology and Ecology and Evolution, College of Arts and Sciences**

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Minors of particular interest to students majoring in Human Evolutionary Biology: Biology (BIO), China Studies (CNS), History (HIS), Japanese Studies (JNS), Judaic Studies (JDS), Korean Studies (KRS), Middle Eastern Studies (MES), Psychology (PSY)

Department Information - Human Evolutionary Biology

The major in Human Evolutionary Biology is offered jointly by the Departments of Anthropology and of Ecology and Evolution. It provides interdisciplinary training in the natural sciences and anthropology to examine how evolutionary forces shaped the human condition. Core courses provide a strong background in the natural sciences, mathematics, and statistics and an introduction to each of three subfields, which include human evolution and morphology, human and non-human primate genetics and genomics, and the evolutionary basis of behavior.

The subfield of human evolution and morphology aims at an understanding of the evolution of the human lineage and its precursors exploring the paleontological, morphological, and cultural transitions in our human ancestors. The emphasis of the human and non-human primate genetics and genomics track is to develop an understanding of the evolution of human variation exploring human genetic diversity and its underlying causes, as well as the phylogenetic relationships of human populations and primate relatives. This includes the basic genetics of humans, human population structure, prehistoric migration and genetic adaptation, and the comparative molecular evolution of the human genome and other primate genomes. The subfield of the evolutionary basis of behavior aims at an understanding of extant human and nonhuman primate behavior and psychology based on the principles of evolutionary theory. The field explores the variation in social systems and life histories and its underlying physiological mechanisms, ecological contexts, and evolutionary bases.

Majors are strongly encouraged to explore research opportunities, either in faculty laboratories or in field projects such as the Turkana Basin or Madagascar Field Schools. The major is suitable for students planning careers in the fields of medicine, dentistry, public health, allied health, biotechnology, and related academic fields such as biological anthropology, bioarchaeology, and evolutionary biology. Interested students should contact the director of the program for details.

Requirements for the Major and Minor in Human Evolutionary Biology

The major in Human Evolutionary Biology leads to the Bachelor of Science degree. Completion of the major requires a minimum of 60 credits. At least 21 credits must be upper division courses (300 level or higher). Students must complete 36 credits in the Core Requirements (I., A-C) and a minimum of 24 credits in the Subfield Courses (II., A-C). Students can either sample broadly across all areas or focus on one of the three subfields. No more than 6-7 credits in the Subfields can be substituted from the area of Related Courses (II., D).

All major courses (including transfer credits) must be passed with a letter grade of C or higher. Courses with S/U grading and courses taken under the Pass/ No Credit option may not be used to satisfy major requirements. EBH 495 and 496 do not count toward the major requirements.

I. Core Requirements

Students must complete 36 credits from three areas including Biology (A), Related Fields (B), and Major Subfields (C).

A. Biology (13 credits)

- BIO 201 Fundamentals of Biology: Organisms to Ecosystems
- BIO 202 Fundamentals of Biology: Molecular and Cellular Biology
- BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences I and BIO 205 Fundamentals of Scientific Inquiry in the Biological Sciences II or BIO 204 Fundamentals of Scientific Inquiry in the Biological Sciences and BIO 207 Fundamentals of Scientific Inquiry in the Biological Sciences IIB
- BIO 354 Evolution

B. Courses Required in Related Fields (11 credits)

- CHE 131 General Chemistry IB (or CHE 129 with CHE 130 and MAT 123)
- MAT 125 Calculus A or MAT 131 Calculus I (if CHE 129, CHE 130, and MAT 123 are taken MAT 125 can be substituted with AMS 151). If students do not place into MAT 125 or 131 on the basis of the math placement examination, MAT 123 is a required course for the major.
- EBH 230 Computer-Based Biostatistics

C. Courses Required from Major Subfields (12 credits)

- ANP 200 Evolution of Human Behavior
- ANP 201 Human Evolution
- BIO 302 Human Genetics
- BIO 350 Darwinian Medicine

II. Subfield Courses

Students must complete a minimum of 24 credits in the Subfield Courses. Students may sample broadly across all subfields, taking classes from Sections A, B and C, or choose to specialize in only one of the three areas.

Courses in the Subfields may be supplemented by courses listed in section D (Related Courses), although only a maximum of 7 of these credits can be applied towards the major.

One of the classes in the Subfields must be a 400-level seminar chosen from ANP 404, ANP 405, ANP 406, ANT 417, ANT 418, ANT 419, ANT 420, or EBH 401.

All advanced Biology courses have one or more 200 level courses as a prerequisite. A grade of C or higher is required in each 200 level prerequisite in order to enroll in any 300 level Biology course.

Some of the courses in the Subfields may require additional prerequisites.

A. Human evolution, morphology, and paleontology

Courses in subfield A:

- ANP 300 Human Anatomy
- ANP 316 The Evolution of the Human Brain
- ANP 321 Primate Evolution
- ANP 404 Human Osteology
- ANP 405 Human Evolution in the Headlines
- ANT 104 Introduction to Archaeology
- ANT 268 Archaeology of Human Origins
- ANT 290 Science and Technology in Ancient Society
- ANT 357 The Agricultural Revolution
- ANT 358 Ways to Civilization
- ANT 373 Archaeology of Human Dispersal
- ANT 417 Primitive Technology
- ANT 418 Lithic Technology
- ANT 419 Zooarchaeology
- BIO 344 Chordate Zoology

B. Human genetics and genomics

Courses in subfield B:

- BIO 203 Fundamentals of Biology: Cellular and Organ Physiology
- BIO 312 Bioinformatics and Computation Biology
- BIO 320 General Genetics
- BIO 325 Animal Development
- BIO 327 Developmental Genetics Laboratory
- BIO 367 Molecular Diversity Lab
- EBH 380 Human and Primate Genomics

C. Evolutionary bases of behavior

Courses in subfield C:

- ANP 220 Controversies in Human Biology and Behavior
- ANP 325 Primate Behavior
- BIO 328 Mammalian Physiology
- BIO 335 Neurobiology Laboratory
- BIO 358 Human Social and Sexual Behavior
- BIO 359 Behavioral Ecology
- PSY 356 Physiological Psychology
- PSY 357 Animal Learning

D. Related courses

- ANP 304 Ecology of the Turkana Basin
- ANP 305 Vertebrate Paleontology of the Turkana Basin
- ANP 306 Paleoanthropological Discoveries of the Turkana Basin
- ANP 307 Comparing Ecosystems in Madagascar
- ANP 326 Lemurs of Madagascar
- ANP 350 Methods Studying Primates
- ANP 360 Primate Conservation
- ANP 406 Pseudoscience and Anthropology
- ANT 215 Climate and Culture
- ANT 307 Archaeology of the Turkana Basin
- ANT 410 Ethnobotany and Paleoethnobotany
- ANT 420 Environmental Analysis Using Remote Sensing and Geographic Information Systems
- BIO 351 Ecology
- GEO 303 Geology of the Turkana Basin

III. Upper-Division Writing Requirement

Majors must submit a paper written for a 300-level or higher course (including Reading or Research courses), which has been deemed satisfactory by the instructor (graded C or higher). The paper must be of appropriate length and format.

Students who wish to use a paper should present the necessary form to the course director and obtain signatures on the form and the paper. The form and the original paper must then be submitted to the Director of the program.

Students should consult with the department advisor to ensure that their plan for completing the Upper Division Writing Requirement is consistent with university graduation requirements for General Education. Students completing the Stony Brook Curriculum (SBC) must complete a course that satisfies the "Write Effectively within One's Discipline" (WRTD) learning objective to graduate. The Upper Division Writing Requirement is consistent in most cases with the SBC learning outcomes for WRTD.

Honors Program in Human Evolutionary Biology

Graduation with honors in Human Evolutionary Biology requires both of the following:

1. A cumulative grade point average of 3.50 or higher in all courses for the major.
2. Completion of an honors thesis based on a one-year independent research project (EBH 495 and 496) under the direction of a faculty member written in the form of a scientific report (20 pages or more). The completed thesis must be approved by a thesis committee.

A student interested in becoming a candidate for honors should, after asking a faculty member to be a sponsor, submit a proposal indicating the topic and procedure of the planned research to the director of the program. The submission should include a supporting statement by the supervising faculty member and the names and approval of two faculty committee members, one of them from a department different from that of the research sponsor. This must ordinarily be done several weeks prior to the beginning of the student's senior year. The student must present a copy of the finished thesis to each member of the thesis committee for their approval at least 14 days before the date of graduation.

Sample Course Sequence for the Major in Human Evolutionary Biology

A course planning guide for this major may be found [here](#).

FRESHMAN

FALL	Credits
First Year Seminar 101	1
WRT 101	3
BIO 201	3
MAT 125	3
CHE 131	4
SBC	3
Total	17

SPRING	Credits
First Year Seminar 102	1
WRT 102	3
BIO 202	3
ANP 201	3
SBC	3
SBC	3
Total	15

SOPHOMORE

FALL	Credits
BIO 204	2
BIO 350 or BIO 354	3
ANP 200	3
SBC	3
SBC	3
Total	14

SPRING	Credits
BIO 205 or BIO 207	2
BIO 302	3
EBH 230	4
SBC	3
SBC	3
Total	15

JUNIOR

FALL	Credits
BIO 350 or BIO 354	3
EBH subfield	3
EBH subfield	3
SBC	3
SBC	3
Total	15

SPRING	Credits
EBH subfield	3
EBH subfield	3
Elective	3
Elective	3
SBC	3
Total	15

SENIOR

FALL	Credits
EBH subfield	3
EBH subfield	3
Elective	3
Elective	3
SBC	3
Total	15

SPRING	Credits
EBH subfield	3
EBH subfield	3
Elective	3
Elective	3
SBC	3
Total	15

EBH Faculty

Faculty information for this program can be found at <http://www.sunysb.edu/anthro/staff.shtml> and <http://life.bio.sunysb.edu/ee/faculty.html>

EBH

Human Evolutionary Biology

EBH 204: Research Skills

Gives students an understanding of and experience with the basic research skills that are needed to do biological and anthropological research. The course includes practical skills in reading and understanding anthropological and biological scientific literature, presentation skills, making scientific posters in biology and anthropology, writing complex arguments, and database management. The accompanying lab section introduces the software that is used to acquire these skills and provides students with practical experience in using them with respect to their own research interests.

Prerequisite: one course chosen from the following: ANP 120, ANT 104, BIO 201, BIO 202, BIO 203

SBC: ESI, SPK

3 credits

EBH 230: Computer-based Biostatistics

An introductory course in statistical analyses, specifically focusing on techniques relevant to research designs in the biological and anthropological sciences. The accompanying lab section will provide students with practical experience in using statistical software to run analyses. This course is offered as both ANP 230 and EBH 230.

Prerequisite: satisfaction of entry skill in mathematics requirement or level 2+ on the mathematics placement examination

DEC: C

SBC: QPS

4 credits

EBH 331: Hormones and Behavior

Examines the relationship between hormones and behavior, both in terms of how hormones affect behavior, and how behavioral interactions can alter hormones. Because hormonal structure and function is remarkably conserved across vertebrates, we will take a comparative approach, exploring data from a variety of vertebrate model systems, while maintaining a keen eye on how such models inform of us about hormones and behavior in humans and non-human primates. Topics to be explored include sex determination, reproductive behavior, personality, dominance and aggression, biological rhythms, the stress response, and the role of endocrine disrupting chemicals in behavior.

Prerequisite: one of the following courses: ANP 120, BIO 201, BIO 202, BIO 203, PSY 250

SBC: STEM+

3 credits

EBH 359: Behavioral Ecology

A consideration of the patterns of animal behavior in relation to ecological circumstances and evolutionary history. Vertebrate examples are emphasized. This course is offered as both BIO 359 and EBH 359.

Prerequisites: BIO 201; BIO 203

3 credits

EBH 380: Human and Primate Genomics

An introduction to the rapidly developing field of primate genomics. Initial lectures provide a foundation in primate diversity, the motivation for their study, how a genome is sequenced and basic phylogenetic approaches. This is followed by discussion of the key findings from recent primate genome projects, beginning with the main features of the human genome, before moving on to the genomes of other primates. We then focus on specific topics from the perspective of primate genomics such as structural variation, sex chromosome evolution, and how non-human primate genomics relates to human health.

*Prerequisite: BIO 201, BIO 202, and BIO 302
Advisory Prerequisite: BIO 204, BIO 312, and BIO 211*

3 credits

EBH 391: Topics in Human Evolutionary Biology

Discussion of a topic of current interest in Human Evolutionary Biology. May be repeated as the topic changes.

Prerequisite: ANP 200 or ANP 201 or BIO 302

Advisory prerequisite: One other EBH or ANP course

3 credits

EBH 401: Seminar in Evolutionary Biology of Humans

Research and discussion of selected topics in evolutionary biology of humans. May be repeated as the topic changes.

Prerequisite: permission of the instructor

3 credits

EBH 447: Readings in Human Evolutionary Biology

Individual advanced readings on selected topics in Human Evolutionary Biology.

May be repeated up to a limit of 6 credits, but not more than two credits may be used toward Human Evolutionary Biology major requirements.

Prerequisite: Permission of instructor and department

1-2 credits, S/U grading

EBH 475: Undergraduate Teaching Practicum I

Work with a faculty member as an assistant in one of the faculty member's regularly scheduled classes. The student is required to attend all the classes, do all the regularly assigned work, and meet with the faculty member at regularly scheduled times to discuss the intellectual and pedagogical matters relating to the course. Not for Human Evolutionary Biology Major credit

Prerequisite: U3 or U4 standing; Human Evolutionary Biology Major; 3.00 g.p.a.; permission of instructor and department

SBC: EXP+

3 credits, S/U grading

EBH 476: Undergraduate Teaching Practicum II

Work with a faculty member as an assistant in one of the faculty member's regularly scheduled classes. Students assume greater responsibility in such areas as leading discussions and analyzing results of tests that have already been graded. The course in which the student is permitted to work as a teaching assistant must be different from the course in which he or she previously served. Not for Human Evolutionary Biology Major credit.

Prerequisite: U3 or U4 standing; Human Evolutionary Biology Major; 3.00 g.p.a.; permission of instructor and department

SBC: EXP+

3 credits, S/U grading

EBH 487: Independent Research in Human Evolutionary Biology

Independent research projects carried out by upper-division students. The student must propose the research project, carry it out, analyze the data, and submit the results in a written form acceptable to the sponsor. May be repeated up to a limit of six credits, but no more than three credits of research may be used for Human Evolutionary Biology Major requirements.

Prerequisite: 15 credits in Human Evolutionary Biology; permission of instructor
0-6 credits, S/U grading

EBH 488: Internship in Human Evolutionary Biology

Participation in state, local, and national public and private agencies and organizations. Students are required to submit written progress reports and a final written report on their experiences to the faculty sponsor and the department. May be repeated to a limit of 12 credits. Not for Human Evolutionary Biology Major credit.

Prerequisite: 15 credits in Human Evolutionary Biology; permission of instructor

SBC: EXP+

0-6 credits, S/U grading

EBH 495: Senior Honors Project in Human Evolutionary Biology

First course of a two-semester project for EBH majors who are candidates for the degree with honors. Arranged in consultation with the director of undergraduate studies, the project involves independent readings or research and the writing of a paper under the close supervision of an appropriate faculty member on a suitable topic selected by the student. Students enrolled in EBH 495 are obliged to complete EBH 496 the following semester. Students receive only one grade upon completion of the sequence EBH 495-496.

Prerequisite: admission to the Human Evolutionary Biology honors program

3 credits

EBH 496: Senior Honors Project in Human Evolutionary Biology

Second course of a two-semester project for EBH majors who are candidates for the degree with honors. Arranged in consultation with the director of undergraduate studies, the project involves independent readings or research and the writing of a paper under the close supervision of an appropriate faculty member on a suitable topic selected by the student. Students receive only one grade upon completion of the sequence EBH 495-496.

Prerequisite: EBH 495 and admission to the EBH honors program

3 credits