The Hebrew University of Jerusalem

Syllabus

Human Evolution - 97998

Last update 10-07-2016

HU Credits: 3

Degree/Cycle: 2nd degree (Master)

Responsible Department: bio-medical sciences in dentistry

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: Prof. Marina Faerman

Coordinator Email: marina.f@mail.huji.ac.il

Coordinator Office Hours: on appointment

Teaching Staff:

Dr. Marina Faerman

Course/Module description:

In this course we will analyze how evolution has shaped the human species. We'll discuss the relationship between modern humans and other Primates, in particular the great apes. We'll develop a perspective for assessing evolutionary changes by analyzing fossils. In addition we'll evaluate the contribution of population genetics studies in modern human groups in search of human origins. We'll be able to evaluate the relationship between anatomically modern humans and Neanderthals by looking at their DNA recovered directly from the bones. The course will include lectures and class presentations.

Course/Module aims:

To provide the students with the basic research tools for approaching the study of human evolution.

Learning outcomes - On successful completion of this module, students should be able to:

On successful completion of this course, students should be able to:

- *Distinguish humans from other primates*
- *Demonstrate knowledge of the principles of paleontology and geological time*
- *Explore the evolutionary changes in the row of early human ancestors, Australopithecines, early and modern members of the genus Homo*
- *Evaluate recent human history as revealed by fossil records and modern genetic data*
- *Critically evaluate the authenticity and usefulness of ancient DNA findings*
- *Explore routes of human migrations in the prehistory*
- *Explain how scientific evidence has been used to reconstruct the process of human evolution*

Attendance requirements(%):

80

Teaching arrangement and method of instruction: Lectures and seminars

Course/Module Content:

Lectures – Part 1: Fossil evidence

1. Introduction and visit to Museum

2. Primates: modern and fossil; our place among the Primates.
3. Possible and probable hominins (S. tchadensis, O. tugenensis, Ar. ramidus) and archaic hominins (Au. anamensis, Au. africanus, K. platyops, Au. afarensis)
4. Megadont archaic hominins (P. aethiopicus, P. boisei, P. robustus) and transitional hominins (H. habilis, H. rudolfensis)
5. Pre-modern Homo (H. ergaster, H. erectus, H. floresiensis, H. antecessor, H. heidelbergensis, H. neanderthalensis)
6. Homo sapiens sapiens: African vs. multiregional origins
7. Near Eastern fossil hominin record
8. Evolutionary trends in human dentition
9. Video: 'Tool making'

Lectures – Part 2: Genetic evidence
10-11. DNA and recent human evolution: mtDNA and Y-chromosomal DNA
12. Ancient DNA studies: Neanderthal genetics; The Denisovans
Seminars - 13-14. Students' seminars

<u>Required Reading:</u>
List of additional reading:
1. Anton S.C. et al. 2014. Evolution of early Homo: An integrated biological perspective. Science 345 (6192), DOI: 10.1126/science.1236828
2. Brunet M. et al. 2002. A new hominid from upper Miocene Chad, Central Africa. Nature 418:145-151.
3. Grün R. 2006. Direct dating of human fossils. Yearbook of Physical Anthropology 49:2–48.
4. Kimbel W.H. et al. 2014. Ardipithecus ramidus and the evolution of the human cranial base. PNAS 111(3):948-953.
5. Pääbo S. 2014. Human condition - a molecular approach. Cell 157, DOI: 10.1016/j.cell.2013.12.036
6. Richmond B.G. and Jungers W.L. 2008. Orrorin tugenensis femoral morphology and the evolution of hominin bipedalism. Science 319:1662-1665.
7. Robson S.L. and Wood B. 2008. Hominin life history: reconstruction and evolution. Journal of Anatomy 212:394-425.
8. Shea J. 2001. The Middle Paleolithic: Early modern humans and Neanderthals in the Levant. Near Eastern Archaeology 64 (1/2): 38-64.
9. Stringer C. 2012. The status of Homo heidelbergensis (Schoetensack 1908). Evolutionary Anthropology 21:101-107.
10. Stringer C. 2014. Small remains still pose big problems. Nature 514:427-429.
11. Stringer C. 2014. Why we are not all multiregionals now. Trends in Ecology & Evolution 29(5):248-251.
12. Veermah K.R. and Hammer M.F. 2014. The impact of whole-genome sequencing on the reconstruction of human population history. Nature Reviews Genetics, DOI:10.1038/nrg3625

13. Wood B. and Lonergan N. 2008. The hominin fossil record: taxa, grades and clades. Journal of Anatomy 212:354-376.

Additional Reading Material:

Additional reading will be suggested at the beginning of the course to select a topic for student's seminar.

Course/Module evaluation:

End of year written/oral examination 60 %
Presentation 40 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:

Language of instruction:
English/Hebrew based upon request.
Written examination: multiple choice exam at the end of semester.