



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze della Terra e del Mare		
<b>ACADEMIC YEAR</b>	2019/2020		
<b>MASTER'S DEGREE (MSC)</b>	NATURAL SCIENCES		
<b>INTEGRATED COURSE</b>	BIOLOGY AND HUMAN EVOLUTION - INTEGRATED COURSE		
<b>CODE</b>	16487		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/08		
<b>HEAD PROFESSOR(S)</b>	SINEO LUCA	Professore Ordinario	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	SINEO LUCA	Professore Ordinario	Univ. di PALERMO
	DUMAS FRANCESCA	Ricercatore	Univ. di PALERMO
<b>CREDITS</b>	9		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	2		
<b>TERM (SEMESTER)</b>	1° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<b>DUMAS FRANCESCA</b> Wednesday 11:00 12:00 via Archirafi 18, studio piano terra. <b>SINEO LUCA</b> Thursday 12:00 14:00 Studio - Via Archirafi 18 - Dip. STEBICEF - Biologia animale e Antropologia		

DOCENTE: Prof. LUCA SINEO

<b>PREREQUISITES</b>	The effective comprehension of the course can be achieved through the solid knowledge of systematic Zoology and Ecology: In order to better understand the processes and have a solid understanding of human evolution it is necessary to know formal and population Genetics, Stratigraphy, Geology and general Palaeontology. The aim of the course is the construction of an evolutionary anthropologist solid in anatomy, genetics and general biology.
<b>LEARNING OUTCOMES</b>	<p>The integrated course offers specialized training in the field of human and non-human primates, evolution, in full coherence with the holistic and naturalistic footprint of the Degree.</p> <p>Capacity to apply knowledge and understanding: acquisition of knowledge and skills for the use of advanced tools as part of anthropological studies and human ecology .</p> <p>Making judgments: students must 'be able to assess the implications of the knowledge in the professional skills and in the research</p> <p>Skills in communication: ability to critically and clearly expose , using appropriate scientific terminology, In the results of different studies.</p> <p>Learning capacities: ability to upgrade through consultation of scientific publications. Capacity to acquire knowledge using teaching tools and arguments provided during the course of studies.Exercise and field exercises will serve to acquire the skills to manage useful tools and technologies in the naturalist profession and most specifically of anthropologist. In particular, guidance will be provided on the use of: transmitted and direct light optical microscopy, electrophoresis, anthropometry by means of calipers and laser scanning, basic topography and excavation techniques. For the morphometry image analysis and Procrustes analyzes will be trained.</p>
<b>ASSESSMENT METHODS</b>	<p>The integrated course includes an evaluation in the form of final oral exam preceded by one or more in-course tests, oral or written agreed with the learners . The tests will consist of 30 items written questionnaire in multiple choice and open-ended questions. Any on-going trials will be evaluated on base 30 (x/30) and the vote will average with the vote of the other subject, for the final evaluation.The workshops will be evaluated by means of practical tests on the arguments .</p> <p>During the oral examination of the integrated course students will be evaluated in the theoretical knowledge and the learned practices and will be evaluated its critical knowledge arguments on anthropology, genetics, ethology and ecology of human and non-human primates.</p> <p>The student will have to demonstrate to have independent judgment on the discipline, understand the evolutionary and phylogenetic implications of the same , evaluate the importance of anthropological knowledge and their applicability in the professional field .</p> <p>Scoring in the various tests will be the result of the critical evaluation of the specific preparation and the ability to perform a reasoned synthesis of the topics. The 18/30 vote will be attributed to the least sufficient test. From 19 to 22 the vote will be indicative of poor preparation; A vote from 23 to 25 will be an indication of a discrete test; The votes from 27 to 29 will indicate a good test; The best test will be evaluated with the highest marks and, if the learner has demonstrated great ability to synthesize and critical ability, it will be commended with the attribution of the laudem.</p>
<b>TEACHING METHODS</b>	The integrated course consists of 9 CFUs organized in two modules of 6 credits and 3 credits. Exercise and field activities are carried out in the module.

**MODULE  
ECOLOGY AND HUMAN EVOLUTION**

*Prof. LUCA SINEO*

**SUGGESTED BIBLIOGRAPHY**

Processes in Human Evolution. The journey from early hominins to Neandertals and Modern Humans  
Francisco J. Ayala and Camilo J. Cela-Conde  
Oxford Univ. Press

<b>AMBIT</b>	20987-Attività formative affini o integrative
<b>INDIVIDUAL STUDY (Hrs)</b>	35
<b>COURSE ACTIVITY (Hrs)</b>	40

**EDUCATIONAL OBJECTIVES OF THE MODULE**

The course of Ecology and Human Evolution takes into consideration the main biological adaptations that have led to the development and to the eco-geographical adaptation of Hominoidea and in particular of the genus Homo. The course will develop lectures on the main concepts of human ecology comparing the ecologies and biologies of hominids and the different men evolved during the Quaternary, then from 2.5 million years to date. Particular attention will be paid to the ecological and genetic relationships between the Upper Pleistocene species: Homo sapiens, Homo neanderthalensis and Homo spp. Denisova.

The course includes a credit of specific excursions in palaeoanthropological sites, during which soil tests and materials will be carried out, which will then be examined in the Laboratory.

The Laboratory, one CFU, for a total of 16 hours, will focus mainly on the analysis of human and animal skeletal findings from Pleistocene and Holocene horizons and on the analysis of bones, palaeo-soils and sediments.

Analysis of geometric morphometrics will be added to the classical morphological analyzes (macro and microscopic analysis) and the student will learn the rudiments of computer analysis and 3D reconstruction.

**SYLLABUS**

Hrs	Frontal teaching
8	Human ecology and evolution of Hominoidea and the Homo genus. Models of adaptation to forest ecology and savannah in Africa. Ecology and paleodemography of the Pleistocene in Europe. Quaternary ecology in Europe: biology and genetics of Pleistocene men.
Hrs	Practice
8	Thematic excursions and collection of materials. The student will be guided in the view of 2 Paleoanthropological sites of the region. At the end of each excursion the student will have to present a report including the naturalistic framing of the site, the anthropological horizons and the typologies, a reasoned collection of soil and surface samples.
Hrs	Workshops
16	Laboratory activities. Skeletal biology laboratory and macro and microscopic morphological analysis of bone, industrial and soils. Biometrics and practice of geometric morphometrics and 3D analysis. Use of the main data acquisition systems and software for morphological analysis .

**MODULE  
BIODIVERSITY AND HUMAN VARIABILITY**

*Prof.ssa FRANCESCA DUMAS*

**SUGGESTED BIBLIOGRAPHY**

textbooks:

Jobling- Human evolutionary Genetics, Garland science

Spedini-Antropologia evolutiva, Piccin

Relethford-Genetica delle popolazioni umane- Casa Editrice Ambrosiana

Caramelli David-Antropologia molecolare-Manuale di base, Firenze University press

<b>AMBIT</b>	50512-Discipline biologiche
<b>INDIVIDUAL STUDY (Hrs)</b>	94
<b>COURSE ACTIVITY (Hrs)</b>	56

**EDUCATIONAL OBJECTIVES OF THE MODULE**

Students will be able to analyze the macro and micro evolutionary differences of our species; they will be able to understand processes that have generated current human biodiversity both at morphological and genetic levels; in particular they will analyse the phenotypic variability and human genetics, analyze the biodiversity of human populations in evolutionary and adaptative perspective, analyze the variability intra and inter-populations.

**SYLLABUS**

Hrs	Frontal teaching
4	Biological Anthropology: introduction on Homo forms and relationships with non-human primates
6	Anthropological characteristics: quantitative and qualitative, examples. Humanity and falsification of the race concept
6	The study of the origin and evolution of Homo sapiens on the base of the molecular approach; the advent of agriculture and the genomic pool of Europeans.
8	Genetics variability and population genetics studies; the factors influencing the genetics and genomics variability: classical and molecular polymorphisms
6	Human adaptability, plasticity and acclimatization; environment and nutrition; environment and diseases
6	Paleogenetics: the study of ancient DNA; H. neanderthalensis and denisova
4	Biodemography, the study of names and Y chromosome
Hrs	Workshops
8	Genomics variability: using "genomic browser "; analysis of literature in English
8	Lab. activities: comparative genomics: classic and Molecular cytogenetics-Hybridization in situ and microscopic analysis; PCR and analysis of human polymorphisms by electrophoresis.