

Health and Environment

Code: 100747
ECTS Credits: 6

Degree	Type	Year	Semester
2500250 Biology	OB	3	1

Contact

Name: Cristina Maria Pereira Dos Santos
Email: Cristina.Santos@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Other comments on languages

The main vehicular language will be Catalan. There will be a group of practices in English.

Prerequisites

There are no prerequisites.

Objectives and Contextualisation

The course of Health and Environment is integrated in the field of Human Biology and, together with the course of Human Biology (second year), give the basics of human biology that can deepen with fourth year courses (Forensic Anthropology, Molecular Anthropology, Human Genetics, Human Origins and Primatology).

In this context, the course of Health and Environment main objective has the study of the different aspects of human variability, both morphologically and physiologically and genetically, with respect to adaptation, acclimatization and adjustment to the environment. The role of different abiotic and biotic factors in the adaptability of the human species is related. Also, it is discussed the issues related to health when the adaptive balance is disturbed.

Competences

- Analyse and interpret the origin, evolution, diversity and behaviour of living beings.
- Apply statistical and computer resources to the interpretation of data.
- Be able to analyse and synthesise
- Be able to organise and plan.
- Characterise, manage, conserve and restore populations, communities and ecosystems.
- Control processes and provide services related to biology.
- Develop a sensibility towards environmental issues.
- Develop critical thinking and reasoning and communicate ideas effectively, both in the mother tongue and in other languages.
- Develop independent learning strategies.
- Respect diversity in ideas, people and situations

- Understand the processes that determine the functioning of living beings in each of their levels of organisation.

Learning Outcomes

1. Analyse present and past intra-population and inter-population variability in our species.
2. Analyse the mechanisms that generate biological diversity in our species and interpret their adaptive significance and the mechanisms that maintain this diversity.
3. Apply statistical and computer resources to the interpretation of data.
4. Be able to analyse and synthesise.
5. Be able to organise and plan.
6. Detect problems associated with population changes and design alternatives.
7. Develop a sensibility towards environmental issues.
8. Develop critical thinking and reasoning and communicate ideas effectively, both in the mother tongue and in other languages.
9. Develop independent learning strategies.
10. Identify the natural and artificial factors that affect human health.
11. Identify the principal natural factors that have intervened in the distribution of human populations.
12. Interact with and advise government institutions operating in the field of social policy and population and public health policy.
13. Interpret values of human demography and epidemiology.
14. Interrelate the environmental, biological and cultural data that merge in the interpretation of human evolution.
15. Respect diversity in ideas, people and situations.
16. Work in teams.

Content

Theory

The subject of Health and Environment consists of six blocks of conceptual contents, eminently theoretical that will be developed following different strategies. Classes are conceived in a dynamic model that seeks to create discussion moments and to clarify wrong preconceived ideas. A conceptual outline of the subject will be presented to students what would allow them to carry out programmed activities of greater complexity, such as reading and discussing articles, visualization and discussion of videos, or applying the of theoretical concepts to the research project and work of the subject, and, in this way, deepen the different topics.

Block I- Presentation and Introduction to the subject

Block II - Demography and Epidemiology

Demography of human populations

Epidemiology of human populations: risk factors and type of design

Introduction to genetic epidemiology

Block III - Interaction of genes and environment

Epigenetics in human variation and disease

Ecogenetics and Pharmacogenetics

Block IV - Human Adaptation to Climate

Adaptation, plasticity and acclimatization

Temperature, humidity, solar radiation and altitude

Block V- Human Nutrition

Nutrition and assessment of nutritional status

Human nutritional evolution

Malnutrition

Nutrigenomics

Block VI - Disease in evolutionary perspective

Evolutionary theory of the disease

Infectious diseases as selective force

Laboratory and computer practices

One of the practice groups will be in English; Students can join freely in this group at the beginning of the course

1. Demography and epidemiology practices

The practices of demography and epidemiology are aimed at providing the bases and general guidelines of the demography and epidemiology research project, in which concepts developed in Block II of theory - demography and epidemiology - are applied, but also other concepts being developed throughout the course.

The practices in computer classroom of demography and epidemiology consist of 5 sessions (four of 2 hours and one of 3 hours) concentrated in the beginning of the semester. Each session addresses practical aspects that students can apply to the development of their research project and the teacher makes a personalized follow-up of the work that each group is developing. To streamline the entire procedure, students have video tutorials developed by the teachers of the subject that facilitate the automation of routine procedures in Excel, Access, Deducer, etc.

2. Somatometry and diet practices

To develop the subjects of human adaptation and nutrition, 4 hours of laboratory practices and 3 hours of computer classroom practice are taught. The results of the two practices will be the basis to perform the work of somatometry and diet.

In the laboratory practice students have the first contact with Anthropometry, its importance and scope of application. During the practice they perform anthropometric and morphological evaluations, applying them to the study of nutritional status and climate adaptation. To carry out the activities, students have a structured guide (previously available in the virtual campus) that specifies exactly all the measures that have to be taken and what is the correct way to do them. The data generated are entered into a database that will include the information of all the groups of practices and in which no identifying element of the students is included (guaranteed the anonymity of the data). These data will be later analysed by the students individually, being part of the work of somatometry and diet.

In the computer classroom practice students perform indirect assessment of their diet based on their own dietary journal. Each student, individually, enters all data related to their consumption of food and beverages, previously recorded for seven consecutive days. Next students get the data of the assessment of their diet. With the results obtained, they must make an analysis and interpretation taking into account reference standards and also the data obtained in the laboratory practice.

Classroom practices

During the classroom practices sessions, the presentation and defence of the research projects carried out during the semester will be carried out.

Specialized seminar

In one of the theory sessions a seminar will be given by a specialist that is invited to speak on a topic related to the subjects of the course. Before the seminar a forum is activated in which the students must share information about the guest with their classmates.

Seminars

1. Introduce the objectives of the research project
2. Expert meeting of the research project
3. How to present a research paper?

Methodology

The development of the training activities of the course is based on: theory classes, seminars, classroom practices and laboratory and computer practices, each of them with its specific methodology. Likewise, a series of virtual-type activities are proposed that will allow the student to take an active role in the teaching-learning process.

Classes of theory: The student acquires the scientific knowledge of the subject by attending theory classes. These are classes with TIC support in which the teacher exposes the subject but also asks for the participation of the student. Likewise, activities prior to the sessions are proposed that allow the student to intervene more actively in the teaching-learning process. The audio-visual material used in class can be found by the student in the Moodle space of the subject.

Classes of practices and seminars: The knowledge acquired in theory classes and in personal study are applied to the resolution of practical cases. Students work in small groups allowing them to acquire the ability to work in groups and to analysis and synthesis. It also allows to apply statistical resources in the interpretation of data. The student will be able to access the practice guides through the Moodle space. The practical classes are directed to support the development of the demography and epidemiology research project (work by group project) and the work of somatometry and diet (individual work).

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classroom practices	5	0.2	3, 8, 10, 15, 4
Computer practices	14	0.56	2, 1, 3, 9, 8, 6, 10, 11, 12, 13, 14, 15, 7, 4
Laboratory practices	4	0.16	2, 1, 3, 10, 11, 14, 16
Seminars	3	0.12	8, 10, 15, 4
Theory classes	26	1.04	2, 1, 8, 6, 10, 11, 12, 13, 14, 15, 7
Type: Supervised			
Tutorship (individual or group)	4	0.16	
Type: Autonomous			
Individual study	34	1.36	2, 1, 8, 6, 10, 11, 12, 13, 14, 15, 7, 4
Preparation of some theoretical content and seminars of the	6	0.24	9, 10, 15

Research project on demography and epidemiology	40	1.6	2, 1, 3, 9, 8, 6, 10, 11, 12, 13, 14, 15, 7, 4
Somatometry and diet work	14	0.56	8, 10, 15, 4

Assessment

For the evaluation of the subject, a continuous assessment model will be followed. The participation of the student, the preparation and presentation of the research project, the work of somatometry and diet and the grade of the summative evaluation will be taken into account, in the following proportions:

- Final summary evaluation: 30%
- Research project on demography and epidemiology (group): 40%
- Somatometry and diet work (individual): 25%
- Student participation in face-to-face and virtual learning activities: 5%

In the development of all the activities, including those of the theoretical typology, the student will be asked to previously prepare some concepts, and in the case of the research project, the whole process of elaboration during the semester will be taken into account. The group research project (both digital support and oral presentation and defence) can be done in Catalan, Spanish or English. Students who use the English language will have a bonus in the final grade of the research project of up to 1 point.

A final summative evaluation will be carried out after all the activities of the subject in which students are required to have a minimum grade of 4 to be able to pass the subject.

Recovery: if needed, the mark of the demographic and epidemiological research project and the summative evaluation can be recovered. To participate in the recovery, the students must have been previously evaluated in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject. Therefore, the students will obtain the "Not Evaluable" rating when the evaluation activities carried out have a weighting of less than 67%.

The grade of the summary evaluation can be raised, in this case, the classification that will be considered will be the last one, regardless of whether it is superior or inferior to that obtained previously.

The average mark of the different evaluable parts detailed before must be equal or superior to 5.0.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Final summative evaluation	30%	0	0	2, 1, 8, 6, 10, 11, 12, 13, 14, 7, 4
Participation in face-to-face and virtual learning activities	5%	0	0	2, 1, 3, 8, 6, 10, 11, 12, 13, 14, 15, 7, 4
Research project on demography and epidemiology (group)	40%	0	0	3, 9, 8, 6, 10, 11, 12, 13, 15, 7, 4, 5, 16
Somatometry and diet work (individual)	25%	0	0	2, 1, 3, 9, 8, 10, 11, 14, 15, 4

Bibliography

BASIC BIBLIOGRAPHY

- COOPER, D.N. i KEHRER-SAWATZKI, H. (2008). Handbook of Human Molecular Evolution. Wiley.
- COSTA, L.G. i EATON D.L. (2006). Gene-Environment interactions - Fundamentals of Ecogenetics. Wiley-Liss.
- IRALA-ESTÉVEZ, J.I. et al. (2004). Epidemiología Aplicada. Ariel Ciencias Médicas.
- FRISANCHO, A.R. (1996). Human Adaptation and Acomodation. The University of Michigan Press.
- JOBLING, M.A. i HURLES, M.E. (2004). Human Evolutionary Genetics - origin, peoples & disease. Garland Science.
- JURMAIN, R. et al. (2009). Essentials of Physical Anthropology. Wadsworth Cengage Learning.
- LARSEN, C.S. (2010). A Companion to Biological Anthropology. Wiley-Blackwell.
- LEWONTIN, R. (1995). Human Diversity. Scientific American Library.
- LUCOCK, M. (2007). Molecular Nutrition and Genomics Nutrition and the Ascent of Humankind. Wiley-Liss.
- MORAN, E.F. (2008). Human Adaptability - An introduction to Ecological Anthropology. Westview press.
- MUEHLENBEIN, M.P. (2010). Human Evolutionary Biology. Cambridge University Press.
- REBATO, E. et al. (2005). Para comprender la antropología biológica. Evolución y Biología Humana. Ed Verbo Divino

SPECIFIC BIBLIOGRAPHY

It will be given during the course.