

**BIOLOGY**

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Basic Sciences	Biology	1	1	6	Obligatory
LECTURER(S)			Postal address, telephone nº, e-mail address		
<ul style="list-style-type: none"> <li>• Amada Pulido Regadera. Group C</li> <li>• Clotilde Marín Sánchez and Francisco Morillas Márquez. Group E</li> </ul>			Amada Pulido Regadera. Department of Plant Physiology, Pharmacy Faculty. <a href="mailto:amadapulido@ugr.es">amadapulido@ugr.es</a>  Clotilde Marín Sánchez. Department of Parasitology, Sciences Faculty. <a href="mailto:cmaris@ugr.es">cmaris@ugr.es</a>  Francisco Morillas Márquez. Department of Parasitology, Pharmacy Faculty. <a href="mailto:fmorilla@ugr.es">fmorilla@ugr.es</a>		
DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT					
Degree in Human Nutrition and Dietetics					
PREREQUISITES and/or RECOMMENDATIONS (if necessary)					
Have an adequate knowledge of English language It is recommended that students have completed the subjects of Biology, Chemistry and Physics during secondary school.					
BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE)					
<ul style="list-style-type: none"> <li>• The cell as structural and functional unit of living organisms. Cell cycle.</li> <li>• Embryo development.</li> <li>• Introduction to Human Genetics.</li> <li>• Introduction to Immunology. Immunity types</li> </ul>					
GENERAL AND PARTICULAR ABILITIES					
<b>General abilities</b> CG1. To recognize the essential elements of the Dietitian-Nutritionist profession, including ethical principles, loyal responsibilities and the exercise of the profession, applying the principle of social justice in the					



professional practice and its development with respect for the persons, their habits, beliefs and cultures.

CG2. To develop their career with respect for other health professionals, acquiring abilities for teamwork.

CG3. To recognize the necessity of actualizing their professional competence, paying special attention to learn in an autonomous and continuous way new approaches, products and techniques in nutrition and feeding.

CG5. To communicate in an effective way with specialist and non specialist persons and with health and industry professionals and media, knowing the information and communication technologies, especially those related with nutrition and life styles.

CG6. To acquire the know-how and critically valorize the information/bibliographic sources related with nutrition, feeding, life styles and healthy behaviors.

CG29. To acquire the base formation for the researching activity, being able of stabling hypotheses, collecting and interpreting information for solving problems, following the scientific method, and understand the importance and limitations of the scientific thinking in health and nutrition.

#### Specific abilities

CE1. Recognize and apply the chemical, biochemical and biological principles for human nutrition and dietetics.

CE2. To know the structure and function of the human body from the molecular level to the whole organism.

CE7. To acquire abilities for teamwork, since this is the unit for the multidisciplinary and interdisciplinary professional development for diagnosis and treatment in dietetics and nutrition.

#### OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)

- Understand the biological diversity that could be used in food processing.
- Understand the fundamental structures and compartments of the cell.
- Identify differences between various types of eukaryotic cells in terms of structure and physiology.
- Be able to describe the principles of transmission of genes and their consequences
- Know the characteristics of nuclear and mitochondrial inheritance.
- Be able to apply basic knowledge of multicellular organisms to Science and Food Technology.
- Knowing how plants and applications of plant tissue cultures in the food industry.
- Knowing how to find and manage bibliographic information in biology.

#### DETAILED SUBJECT SYLLABUS

- Item 1. - General characteristics of living organisms. Levels of organization. The biological classification.
- Item 2. - Prokaryotic and eukaryotic cells: differences. Prokaryotic cell model.
- Item 3. - Eukaryotic cell. Organization. Cell wall: Structure. Chemical composition and physiological roles. Plasma membrane: Structure. Chemical composition. Molecular architecture. Physiological roles of the membrane. Transport of substances.
- Item 4. - Specializations of the cell surface. Microvilli and invaginations. Junctional complexes.
- Item 5. - Cytosol. Chemical composition. Importance as a reserve of materials. Metabolic pathways.
- Item 6. - Cytoskeleton. Microtubules. Intermediate filaments. Actin filaments. Physiological roles of these structures. Cilia and flagella.
- Item 7. - Smooth and rough endoplasmic reticulum. Ribosomes and polysomes. Physiological roles.
- Item 8. - Golgi apparatus. Structure. Chemical composition. Physiological roles.
- Item 9. - Lysosomes. Structure. Chemical composition. Physiological role. Peroxisomes and other organelles: structure and function.
- Item 10. - Mitochondria. Structure. Chemical composition. Physiological roles.



- Item 11. - Chloroplast. Structure. Chemical composition. Physiological roles.  
Item 12. - Transmission of signals between cells: cell communication.  
Item 13. - The Nucleus. Structure. Chemical composition. Nuclear envelope. Chromatin and chromosomes. Molecular constituents. Transmission and expression of genetic information. Nucleolus.  
Item 14. - Cell Division: Mitosis and Meiosis. Cell Cycle. Types of asexual and sexual reproduction.  
Item 15. - Embryo development and maternal-fetal relationship. Cellular mechanisms of development.  
Item 16. - Introduction to Genetics. Mendel's laws. Genes and chromosomes. Karyotype. Genotype and phenotype. Family tree. Human genome.  
Item 17. - Non-Mendelian inheritance. Incomplete dominance. Codominance. Multiple alleles. Multiple alleles: The ABO blood group and Rh.  
Item 18. - Mutations. Types. Penetrance. Expressivity. Numeric and morpho-structural alterations of the autosomes. Down's syndrome  
Item 19. - Alterations of the sex chromosomes. Sex-linked inheritance. Syndromes of Klinefelter and Turner. A Hemophylia. Fragile X syndrome.  
Item 20. - Extranuclear inheritance. Mitochondrial inheritance.  
Item 21. - Monogenic inheritance. Autosomal dominant inheritance. Autosomal recessive inheritance: Hemochromatosis. Cystic fibrosis. Phenylketonuria. Sickle-cell Anaemia.  
Item 22. - Polygenic inheritance: Diabetes. Alzheimer. Hypertension. Obesity. Cancer. Susceptibility to infectious diseases.  
Item 23. - Food intolerance: Lactose intolerance. Favism.  
Item 24. - Introduction to Immunology. Types of Immunity.

Laboratory Practice:

- Practice 1. Observation of animal and plant cells. Observation of organelles.  
Practice 2. Mitosis.  
Practice 3. Determination of nitrate in plant samples.  
Practice 4. Plant tissue culture.

READING

RECOMMENDED INTERNET LINKS

- Virtual classroom of Genetics (<http://www.ucm.es/info/genetica/AVG/index.htm>)
- Classic articles of Genetics (<http://www.esp.org>)
- The Biology Project (<http://www.biology.arizona.edu>)
- Omin-online Mendelian inheritance in man (<http://www.ncbi.nlm.nih.gov>)
- Hypertext of Biology (<http://www.biologia.edu.ar/>)

