



University of Nicosia, Cyprus

Course Code BIOL-413	Course Title Perspectives of Biotechnology	ECTS 8
Department Life and Health Sciences	Semester Spring/Fall	Prerequisites BIOL-311 Molecular Biology
Type of Course Elective	Field Molecular Biology, Biotechnology	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 4 th	Lecturer Dr. Kyriakos Felekkis
Mode of Delivery face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The course will review the biotechnology advancements from a non-technical point of view, and their impact in improving human health and living. The main objectives of the course are to:

- Give an overview of genetic engineering and genomic technology.
- Describe the applications of biotechnology in agriculture, food and the pharmaceutical industry.
- Use case studies and literature to discuss the applications of biotechnology for human and animal health.
- Use case studies and literature to discuss the biomedical, industrial and environmental biotechnology application of microbes.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. Explain the concepts of modern biotechnology.
2. Identify and explain the principles of recombinant DNA.
3. Describe common biotechnology methods and applications in microorganisms, plants and animals and discuss their impact to industry and the environment.
4. Appraise the impact of the Human Genome project in medical research and treatment of diseases.
5. Appraise the impact of biotechnology applications in the food industry.
6. Debate the ethical issues regarding gene therapy, cloning, GM crops and the creation of genetic databases and access to genetic technologies.
7. Practice skills on literature searches and on communication through debate.

Course Contents:

1. Introduction and History of Biotechnology
2. Core Technologies: recombinant DNA and Monoclonal Antibodies
3. Genetic Technologies: e.g., PCR, Genomics, Gene therapy,
4. Proteomics, Antisense,
5. Agricultural Biotechnology; GM crops
6. Industrial and Environmental Biotechnology applications
7. Biological Product Development Advances
8. Human embryonic stem cells
9. The cloning of dolly, livestock and other mammals
10. Therapeutic vs. Reproductive cloning
11. The Human Genome Projects and its vision
12. Gene therapy, promises and reality
13. Research ethics in Biotechnology

Learning Activities and Teaching Methods:

Lectures, Case study presentations and discussion, Literature reviews; videos and debate sessions.

Assessment Methods:

Written assignments, oral presentations; Mid-term exam; Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
1. A. Borem, F.R. Santos, D.E. Bowen	Understanding Biotechnology	Prentice Hall PTR	2003	ISBN: 0131010115
2. B.R. Glick,.J.J. Pasternak	Molecular Biotechnology: Principles and Applications of Recombinant DNA.	American Society Microbiology	2003, 3 rd ed.	ISBN: 1555812244

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
1. DJA Crommelin, RD Sindelar	Pharmaceutical Biotechnology Biochemists and Molecular Biologists	T&F STM	2002, 2 nd ed.	ISBN: 0415285011