

BiS 321

Prof. Jong H. Park & Je-Kyun Park

Spring 2004

Room 217, E16 Building
Tue, Thu 14:30-16:00

BiS 321
Systems Bioengineering

Synopsis

This course discusses the basic concepts of systems biology and practical applications of bioengineering to biomedical, food, environmental, energy and electronics industry. This course also covers the following topics in the field of new biotechnology: the nature of living things and the principles of manipulating them; enabling technologies; different approaches of biotechnology; specific applications such as medical, industrial, and environmental; and social issues such as intellectual property, regulations, biotech business, and biowarfare.

Credit

3 units (3:0:3)

Prerequisite

Recommended prerequisite courses include BS120, BiS 221, BiS 222, or equivalent.

Grading

Midterm Exam. 30%, Final Exam. 30%. The Midterm Exam can be replaced with Essays and presentations.
Homework & Quiz 40%.

Office Hours

Tue, Thu 13:00-14:30

Prof. Jong H. Park (Room 701/E16, Tel: 4318, biopark@kaist.ac.kr)

Prof. Je-Kyun Park (Room 801/E16, Tel: 4315, jekyun@kaist.ac.kr)

Teaching Assistants

HanSol Choi (apine@kaist.ac.kr, Tel: 5358, Room 703/E16)

Wonjae Choi (deep@kaist.ac.kr, Tel: 4355, Room 802/E16)

Textbook

George Acquaah (2004). *Understanding Biotechnology: An Integrated and Cyber-Based Approach*, Pearson Prentice Hall, ISBN: 0130945005

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Lecture Schedule

Week	Topics	Contents	Instructors
1	Introduction	Course Outline	<i>Jong H. Park</i>
2	Enabling Technologies of Biotechnology	The Nature of Living Things. Recombinant DNA Technology	
3		Molecular Markers. DNA Synthesis	
4		Genome Mapping. DNA Sequencing. Genetic Information	
5	Structural Genomics,	Genome Sequencing. Protein Structure Determination	
6	Functional Genomics &	Bioinformatics. DNA Microarrays. Proteomics	
7	Protein Engineering	Protein Engineering. Antisense Technology	
8	<i>Midterm Exam.</i>		
9	Special Applications	Human Health and Diagnostics	<i>Je-Kyun Park</i>
10		Bioprocessing. Microbial-Based Pharming	
11		Biosensors. Biochips. BioTools	
12	Social Issues	Intellectual Property. Ethical Implications. Regulations	
13		Biotechnology as a Business	
14		Perceptions and Bioterrorism	
15	The Future Biotechnology & Bioengineering		
16	<i>Final Exam.</i>		