

Işık University
Faculty of Arts and Sciences
Department of Physics

BIO 101 - Biology

COURSE SYLLABUS

Course Name	Code	Semester	Theory (hour/week)	Application (hour/week)	Laboratory (hour/week)	Local Credits	ECTS
Biology	BIO 101	Spring	3	0	0	3	5

Prerequisites	None
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Course Language	English
Course Type	Elective
Course Level	First Cycle
Course Coordinator	-
Course Lecturer(s)	-
Course Assistants	-
Course Objectives	<p>This course is designed to provide fundamental elementary principles of life to biomedical engineering students. By the end of the course, students should</p> <ul style="list-style-type: none"> • demonstrate a knowledge on the fundamental basis of biological processes • apply the fundamental laws of biology to design and solve various experiments • recognize how biology is relevant to the world around them.
Course Learning Outcomes	<p>On successful completion of this course students will be able to</p> <ol style="list-style-type: none"> 1. demonstrate a conceptual understanding of the fundamental biological processes 2. recognize how the fundamental biological processes can be applied to solve a variety of problems, 3. analyze the properties of cell metabolism and cellular processes, 4. learn the basis of recombinant DNA technology, 5. develop an understanding on the origins and history of life under the light of evolution 6. discuss how biology is relevant to the world around them.
Course Content	<p>Atomic basis of life and biomolecules; cell structure and function; cell metabolism; movement of materials across membranes; photosynthesis, fermentation and respiration; cell division; Mendelian genetics; molecular basis of genetics; control of gene expression; recombinant DNA technology; human genetics; mechanisms and evidence of evolution; the origin and history of life.</p>

WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week	Subject
1	Introduction to biology and the study of life
2	Chemistry of Life, Biomolecules
3	Cell structure and function, Sub-cellular structures
4	Energy, Enzymes and metabolic pathways, Movement across the membranes
5	Processing energy: Fermentation and Respiration
6	Cell division: Mitosis and Meiosis
7	Review, Main cellular mechanisms
8	The genetic basis of life: Laws of inheritance, Principles of Mendel, Chromosomal theory of inheritance
9	Molecular basis of inheritance; Central Dogma of molecular biology, Replication and repair of DNA
10	Transcription, Splicing, Genetic code, Protein synthesis
11	Review, Main genetic mechanisms
12	Control of genetic expression
13	Evolutionary history of biological diversity
14	Origins of life
15	Review, cellular genetic and evolutionary aspects of biology

TEXTBOOKS

Required Textbook(s)	Molecular Biology of the Cell 5th Edition Selected Chapters Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter Garland Science, New York , 2008.
Recommended Readings	<ul style="list-style-type: none">• Berg, Jeremy M., Biochemistry , 6th Edition, Freeman Publishers, New York, 2002• http://www.ncbi.nlm.nih.gov/education/

EVALUATION SYSTEM

Semester Requirements	Number	Percentage of Grade
Attendance/Participation	-	-
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Quizzes/Studio Critics	3	6
Homework Assignments	10	16
Presentation/Jury	-	-
Project	-	-
Seminar/Workshop	-	-
Midterms/Oral Exams	2	52
Final/Oral Exam	1	26
Total	16	100

Percentage of Semester Work	15	74
Percentage of Final Work	1	26
Total	16	100

COURSE CATEGORY

ISCED GENERAL FIELD CODE	GENERAL FIELDS	ISCED MAIN AREA CODE	MAIN EDUCATIONAL AREAS	%
1	Eđitim	14	Öđretmen Yetiřtirme ve Eđitim Bilimleri	0
2	Beřeri Bilimler ve Sanat	21	Sanat	0
2	Beřeri Bilimler ve Sanat	22	Beřeri Bilimler	0
3	Sosyal Bilimler, İřletme ve Hukuk	31	Sosyal ve Davranıř Bilimleri	0
3	Sosyal Bilimler, İřletme ve Hukuk	32	Gazetecilik ve Enformasyon	0
3	Sosyal Bilimler, İřletme ve Hukuk	38	Hukuk	0
4	Bilim	42	Yařam Bilimleri	0
4	Bilim	44	Doęa Bilimleri	80
4	Bilim	46	Matematik ve İstatistik	20
4	Bilim	48	Bilgisayar	0
5	Mühendislik, Üretim ve İnřaat	52	Mühendislik	5
5	Mühendislik, Üretim ve İnřaat	54	Üretim ve İřleme	0
5	Mühendislik, Üretim ve İnřaat	58	Mimarlık ve Yapı	0
6	Tarım	62	Tarım, Ormancılık, Hayvancılık ve Su Ürünleri	0
6	Tarım	64	Veterinerlik	0
7	Saęlık ve Refah	72	Saęlık	0
7	Saęlık ve Refah	76	Sosyal Hizmetler	0
8	Hizmet	81	Kiřisel Hizmetler	0
8	Hizmet	84	Ulařtırma Hizmetleri	0
8	Hizmet	85	Çevre Koruma	0
8	Hizmet	86	Güvenlik Hizmetleri	0

THE RELATIONSHIP BETWEEN COURSE LEARNING OUTCOMES AND PROGRAM OUTCOMES

Number	Program Outcomes	Level of Contribution*				
		1	2	3	4	5
1	To have a comprehension of the core areas of physics, including classical and quantum mechanics, electromagnetism, statistical and thermal physics.					
2	To have a comprehension of basic mathematics, including differential and integral calculus, linear algebra, differential equations and complex analysis.					
3	To have a comprehension of computer programming and chemistry.	X				
4	To have a comprehension of the importance and practice of good ethical standards.			X		
5	To have a recognition of contemporary issues in science and its applications.			X		
6	To have an ability to construct theoretical models, solve problems, design and conduct experiments, as well as to analyze and interpret data.		X			
7	To have an ability to demonstrate their understanding of at least one advanced topic in theoretical or experimental physics.					
8	To have an ability to function on multi-disciplinary teams			X		
9	To have an ability to effectively communicate information in both written and verbal form		X			
10	To have a recognition of the need for and an ability to engage in life-long learning.				X	
11	To have an ability to use modern physics techniques, skills, and computing tools necessary for physics practice (use laboratory and workshop equipment to generate data, prepare technical drawings, prepare technical reports, give technical presentations, take notes effectively, write computer programs, use mathematics and/or computational tools and packages to make models) .					

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

<p>Contribution of Course Learning Outcomes to Program Outcomes</p>	<p>The class contributes to the student development in terms of building a solid foundation of biology for further study in lifel sciences. Students should develop problem solving abilities and enhance critical thinking and improve their written communication skills.</p>
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ECTS / WORKLOAD TABLE

Activities	Number	Duration (Hour)	Workload (Hour)
Course Hours (Including Exam Week: 16 x Total Hours)	15	3	45
Laboratory	-	-	-
Application	-	-	-
Special Course Internship (Work Placement)	-	-	-
Field Work	-	-	-
Study Hours Out of Class	15	2	30
Presentations / Seminar	-	-	-
Project	-	-	-
Homework Assignments	10	2	20
Quizzes	3	1	3
Midterms / Oral Exams	2	9	18
Final / Oral Exam	1	9	9
		Total Workload	125
		Total Workload/25	5