Işık University
Faculty of Arts and Sciences
Department of Physics

PHYS 101 - General Physics I

COURSE SYLLABUS

Course Name	Code	Semester	Theory (hour/week)	Application (hour/week)	Laboratory (hour/week)	Local Credits	ECTS
General Physics I	PHYS 101	Fall	**3**	0	**0**	**3**	5

Prerequisities	None

Course Language	English
Course Type	Required
Course Level	First Cycle
Course Coordinator	-
Course Lecturer(s)	-
Course Assistants	-
Course Objectives	This is a calculus based introductory physics course on the mechanics of objects. By the end of the course, students should • demonstrate a knowledge of the fundamental physical laws of mechanics. • apply the fundamental laws of mechanics to solve various practical problems. • recognize how physics is relevant to the world around them.
Course Learning Outcomes	On successful completion of this course students will be able to 1. demonstrate a conceptual understanding of the fundamental physical laws of dynamics involving gravitation, 2. recognize how the fundamental physical laws can be applied to solve a variety of problems, 3. analyze the properties of translational and rotational motion, 4. employ Newton's equations and conservation laws, 5. explain the historical development of these concepts, 6. discuss how physics is relevant to the world around them.
Course Content	Standards and units; vectors and coordinate systems; kinematics, dynamics; work and energy; dynamics of system of particles; conservation of energy and momentum, collisions; rotational kinematics and dynamics; equilibrium of rigid bodies; oscillations.

WEEKLY SUBJECTS AND RELATED PREPARATION STUDIES

Week	Subject
1	Introduction, Measurement, Estimating, Units and Dimensions. Motion in One Dimension.
2	Kinematics: Displacement, Speed and Velocity, Acceleration, Freely Falling Objects. Scalars and vectors.
3	Motion in 2-D and 3-D: Position, Velocity, Acceleration, Projectile Motion, Circular Motion, and Relative Motion.
4	Dynamics: Newton's Laws, Using Newton's Laws.
5	Applications of Newton's Laws: Gravitation, Friction, Drag Forces, Forces and Circular Motion.
6	Review. Introduction to Work and Energy.
7	Work, Kinetic Energy, Work-energy Principle.
8	Conservative and Nonconservative Forces, Potential Energy, Conservation of Energy.
9	Linear Momentum and Its Conservation, Elastic and Inelastic Collisions, Center of Mass
10	Oscillations and Waves: Simple Harmonic Motion and Simple Pendulum.
11	Rotational Motion, Torque, Rotational Inertia, Rotational Kinetic Energy.
12	Review. Introduction to Angular Momentum
13	Angular Momentum and Its Conservation. Dynamics of Rotation.
14	Work and Energy in Angular Motion.
15	Review

TEXTBOOKS

Required Textbook(s)	Douglas C. Giancoli, *Physics for Scientists and Engineers with Modern Physics*, Prentice Hall, New Jersey, 2009 (4^{th} Edition).
Recommended Readings	• H.D. Young and R.A. Freedman, *University Physics,* 11th Edition, Pearson Education Inc., New York, 2004. • Feynman, R.P., Leighton, R.B., Sands, M. *The Feynman Lectures on Physics, Volume I*, Addison Wesley, 1966.

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	Eğitim	14	Öğretmen Yetiştirme ve Eğitim Bilimleri	0
2	Beşeri Bilimler ve Sanat	21	Sanat	0
2	Beşeri Bilimler ve Sanat	22	Beşeri Bilimler	0
3	Sosyal Bilimler, İşletme ve Hukuk	31	Sosyal ve Davranış Bilimleri	0
3	Sosyal Bilimler, İşletme ve Hukuk	32	Gazetecilik ve Enformasyon	0
3	Sosyal Bilimler, İşletme ve Hukuk	38	Hukuk	0
4	Bilim	42	Yaşam Bilimleri	0
4	**Bilim**	**44**	**Doğa Bilimleri**	**80**
4	**Bilim**	**46**	**Matematik ve İstatistik**	**20**
4	Bilim	48	Bilgisayar	0
5	Mühendislik, Üretim ve İnşaat	52	Mühendislik	5
5	Mühendislik, Üretim ve İnşaat	54	Üretim ve İşleme	0
5	Mühendislik, Üretim ve İnşaat	58	Mimarlık ve Yapı	0
6	Tarım	62	Tarım, Ormancılık, Hayvancılık ve Su Ürünleri	0
6	Tarım	64	Veterinerlik	0
7	Sağlık ve Refah	72	Sağlık	0
7	Sağlık ve Refah	76	Sosyal Hizmetler	0
8	Hizmet	81	Kişisel Hizmetler	0
8	Hizmet	84	Ulaştırma 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.					X
2	To have a comprehension of basic mathematics, including differential and integral calculus, linear algebra, differential equations and complex analysis.					X
3	To have a comprehension of computer programming and chemistry.					
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.					
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					
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

Contribution of Course Learning Outcomes to Program Outcomes	The class contributes to the student development in terms of building a solid foundation of classical physics for further study in physical sciences. Students should develop problem solving abilities and enhance critical thinking and improve their written communication skills.

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**