Syllabus [2025Year 1 Term]

Course Information

Course Title	General Physics	Credits	3
Course Code	559400-1	Required/Elective (For Undergraduate Courses)	Mandatory Major
Department or Major	Department of Bio and Material Engineering	Language	English
Methods of Teaching		Lecture Room	수13,14,15,16,17,18(사범312)
Time Allotment	Lecture(3) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(0)	Cyber Lectures	
Course Type	offline		

Lecturer

Lecturer	Name	Kyongwan Kim	Rank	Invited Professor	Final Academic Degree	이학박사
	Department & college	Department of Physics		Office		
	Office Phone Number	—		e-mail	luiko74@gmail.com	
	Field of Interest					

Course Summary

Course Description	Among various subjects in the general physics course, mechanics, oscillations and waves, electricity and magnetism, and properties of light will be mainly covered. We study several fundamental laws of physics based on mathematical descriptions that display the relationships among the physical notions required to deal with these particular topics.
Description Related Courses	
Course Goals	A systematic understanding of general properties about the force and motion involved in systems of single-particle, many-particle, or continuous material. Utilization of elementary mathematics in solving physics problems that arise in such systems.
Projected Results	Improvement of the ability to analyze and interpret scientific phenomena observed in various fields, in terms of basic concepts and general principles of physics.
Percentage of the original langua	100%

ge classes(%)	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	INTRODUCTION, MEASUREMENT, ESTIMATING	Measurement and Uncertainty; Significant Figures, Units, Standards, and the SI System, Converting Units, Reference Frames and Displacement	강의, 토의토론수업,	
2	DESCRIBING MOTION: KINEMATICS IN ONE DIMENSION	Average Velocity, Instantaneous Velocity, Acceleration, Motion at Constant Acceleration, Solving Problems, Freely Falling Objects, Graphical Analysis of Linear Motion	강의, 토의토론수업,	
3	KINEMATICS IN TWO DIMENSIONS; VECTORS	Vectors and Scalars, Addition of Vectors—Graphical Methods, Subtraction of Vectors, and Multiplication of a Vector by a Scalar, Adding Vectors by Components, Projectile Motion, Solving Projectile Motion Problems, Relative Velocity	강의, 토의토론수업,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
4	DYNAMICS: NEWTON'S LAWS OF MOTION	Force, Newton's First Law of Motion, Mass, Newton's Second Law of Motion, Newton's Third Law of Motion, Weight—the Force of Gravity; and the Normal Force, Solving Problems with Newton's Laws: Free-Body Diagrams, Problems Involving Friction, Inclines	강의, 토의토론수업,	
5	CIRCULAR MOTION; GRAVITATION	Kinematics of Uniform Circular Motion, Dynamics of Uniform Circular Motion, Highway Curves: Banked and Unbanked, Newton's Law of Universal Gravitation, Gravity Near the Earth's Surface, Satellites and "Weightlessness", Planets, Kepler's Laws, and Newton's Synthesis, Types of Forces in Nature	강의, 토의토론수업,	
6	WORK AND ENERGY, LINEAR MOMENTUM	Work Done by a Constant Force, Work Done by a Var	강의, 토의토론수업,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		ying Force, Kinetic Energy, and the Work–Energy Principle, Potential Energy, Conservative and Nonconservative Forces, Mechanical Energy and Its Conservation, Problem Solving Using Conservation of Mechanical Energy, Other Forms of Energy and Energy Transformations; The Law of Conservation of Energy, Energy Conservation with Dissipative Forces: Solving Problems, Power		
7	Mid-term Exam		Written Exam	
8	FLUIDS	Phases of Matter, Density and Specific Gravity, Pressure in Fluids, Atmospheric Pressure and Gauge Pressure, Pascal's Principle, Measurement of Pressure; Gauges and the Barometer, Buoyancy and Archimedes' Principle,	강의, 토의토론수업,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		Fluids in Motion; Flow Rate and the Equation of Continuity, Bernoulli's Equation, Applications of Bernoulli's Principle		
9	OSCILLATIONS AND WAVES	Simple Harmonic Motion—Spring Oscillations, Energy in Simple Harmonic Motion, The Period and Sinusoidal Nature of SHM, The Simple Pendulum, Types of Waves and Their Speeds: Transverse and Longitudinal, Energy Transported by Waves, Reflection and Transmission of Waves, Interference; Principle of Superposition, Standing Waves; Resonance	강의, 토의토론수업,	
10	ELECTRIC CHARGE AND ELECTRIC FIELD	Static Electricity; Electric Charge and Its Conservation, Electric Charge in the Atom, Insulators and Conductors, Induced Charge; the Electroscope, Coulomb's Law,	강의, 토의토론수업,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		Solving Problems In volving Coulomb's Law and Vectors, The Electric Field, Electric Field Lines, Electric Fields and Conductors		
11	ELECTRIC POTENTIAL, ELECT RIC CURRENTS	Electric Potential En ergy and Potential Difference, Relation between El ectric Potential and Electric Field, Equipotential Lines and Surfaces, The Electron Volt, a Unit of Energy, Electric Potential Du e to Point Charges, Potential Due to Ele ctric Dipole; Dipole Moment, Capacitance, Dielectrics, Storage of Electric Energy The Electric Battery, Electric Current, Ohm's Law: Resista nce and Resistors, Resistivity, Electric Power, Alternating Current	강의, 토의토론수업,	
12	DC CIRCUIT, MAGNETISM	EMF and Terminal Voltage,	강의, 토의토론수업,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		Resistors in Series and in Parallel, Kirchhoff's Rules, EMFs in Series and in Parallel; Charging a Battery, Magnets and Magnetic Fields, Electric Currents Produce Magnetic Fields, Force on an Electric Current in a Magnetic Field; Definition of Force on an Electric Charge Moving in a Magnetic Field Magnetic Field Due to a Long Straight Wire Force between Two Parallel Wires, Solenoids and Electromagnets, Torque on a Current Loop; Magnetic Moment		
13	ELECTROMAGNETIC INDUCTION AND FARADAY'S LAW	Induced EMF, Faraday's Law of Induction; Lenz's Law, EMF Induced in a Moving Conductor, Changing Magnetic Flux Produces an Electric Field, Electric Generators, Back EMF and Counter Torque; Eddy Currents,	강의, 토의토론수업,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		Transformers and Transmission of Power		
14	ELECTROMAGNETIC WAVES, LIGHT	Changing Electric Fields Produce Magnetic Fields; Maxwell's Equations, Production of Electromagnetic Waves, Light as an Electromagnetic Wave and the Electromagnetic Spectrum, The Ray Model of Light, Reflection; Image Formation by a Plane Mirror, Formation of Images by Spherical Mirrors, Index of Refraction, Refraction: Snell's Law, Total Internal Reflection; Fiber Optics, Waves vs. Particles; Huygens' Principle and Diffraction, Interference—Young's Double-Slit Experiment, Diffraction by a Single Slit or Disk	강의, 토의토론수업,	
15	Final Exam		Written Exam	

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	30%	
2	Final-exam	30%	
3	Pop Quizzes	0%	
4	Assignments	20%	
5	Reports	0%	
6	Presentations & Discussions	0%	
7	Attendance	20%	
8		0%	
9	Others	0%	
All		100%	

Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력		0%
혁신 (Discovery)	도전 (Challenging)	전공 지식을 새로운 분야와 융합하고 아우를 수 있는 능력		0%
혁신 (Discovery)	지식융합 (Knowledge convergence)	새로운 분야를 개척하거나 도전적으로 임할 수 있는 능력		0%
헌신 (Dedication)	세계시민 (Universal value)	세계 공동체 구성원으로 전공자로서 국제적 이슈에 대응할 수 있는 능력		0%
헌신 (Dedication)	상호협력 (Cooperation)	공동의 목적 달성을 위해 타인과 상호협력을 할 수 있는 능력		0%
헌신 (Dedication)	공동체 (Sense of community)	공동체의 구성원으로서 필요한 태도와 윤리의식을 가질 수 있는 능력		0%
능동 (self- Determination)	자기주도 (Self-Managing)	주어진 상황과 문제를 주도적이고 능동적으로 해결할 수 있는 능력	주역량	40%
능동 (self- Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력		0%

핵심가치	전공역량	역량정의	역량구분	값(%)
능동 (self-Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력	부역량	30%
능동 (self-Determination)	의사소통 (Articulation)	대화를 통해 다양한 의견을 조율하고 합의를 이끌어 낼 수 있는 능력	부역량	30%

Textbook(s) & References

Description	Title	Author	Publisher
Required Textbook	Physics: Principles with Applications, Global Edition, 7th edition	Douglas C. Giancoli	Pearson

Memo

Please check regularly "Announcements", "Lecture Contents" and "Inbox" of e-Campus.