Universida_{de}Vigo

Subject Guide 2023 / 2024

IDENTIFYIN	<u> </u>			
Physics: Ph				
Subject	Physics: Physics 2			
Code	V12G320V01202			
Study	Grado en			
programme	Ingeniería			
	Eléctrica		,	
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching	Spanish			
language			,	
Department				
Coordinator	Fernández Fernández, José Luís			
Lecturers	Añel Cabanelas, Juan Antonio			
	Blanco García, Jesús			
	Cabaleiro Álvarez, David			
	Fernández Fernández, José Luís			
	Hermida Merino, Daniel			
	Lusquiños Rodríguez, Fernando			
	Paredes Galán, Ángel			
	Quintero Martínez, Félix			
	Ribas Pérez, Fernando Agustín			
	Salgueiriño Maceira, Verónica Soto Costas, Ramón Francisco			
	Varela Benvenuto, Ramiro Alberto			
	Vázquez Besteiro, Lucas			
E-mail				
Web	jlfdez@uvigo.es			
General	http://moovi.uvigo.gal/	straductory physics	The feetie is an al	o ctricity
description	This undergraduate course is the second quarter of ir magnetism and thermodynamics	itroductory physics.	The focus is on el	ectricity,

Training and Learning Results

Code

- B3 CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
- C2 CE2 Understanding and mastering the basics of the general laws of mechanics, thermodynamics, waves and electromagnetic fields, as well as their application for solving engineering problems.
- D2 CT2 Problems resolution.
- D9 CT9 Apply knowledge.
- D10 CT10 Self learning and work.

Expected vaculta from this cubiact			
Expected results from this subject			
Expected results from this subject	Tra	Training and Learning	
		Res	sults
Understanding the basic concepts of electromagnetism and thermodynamics.	В3	C2	
Knowing the basic instruments for the measurement of physical quantities.		C2	
Knowing the basic techniques for experimental data evaluation.	В3	C2	D9
			D10
Ability to develop practical solutions to basic technical problems in engineering, within the	В3	C2	D2
framework of electromagnetism and thermodynamics.			D9
			D10

Contents		
Topic		

1.3 Coulomb's Law. 1.4 Electric Field and Electric Forces. 1.5 Electric Field Calculations. 1.6 Electric Field Lines. 1.7 Electric Dipoles. 2 GAUSS'S LAW 2.1 Charge and Electric Flux. 2.2 Calculating Electric Flux. 2.3 Gauss's Law. 2.4 Applications of Gauss's Law. 2.5 Conductors in Electric Static Equilibrium. 3 ELECTRIC POTENTIAL 3.1 Electric Potential Energy. 3.2 Electric Potential Energy. 3.2 Electric Potential Energy. 3.3 ELECTRIC POTENTIAL 3.1 Electric Potential Energy. 3.2 Electric Potential Energy. 3.3 Electric Potential Energy. 3.4 Equipotential Surfaces. 3.5 Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4.1 Capacitors in Series and Parallel. 4.2 Capacitors in Capacitors and Electric-Field Energy. 4.4 Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5 Gauss's Law in Dielectrics. 4.6 Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 Electric Current. FORCE 5.2 Current and Current Density. 5.3 Onm's Law and Resistance. 5.4 Electromotive Force and Circuits. 5.5 Energy and Power in Electrical Circuits. 5.6 Basic Theory of Electrical Conduction. 6.1 Magnetic Field. 6.2 Motion of Charged Particles in a Magnetic Field. 6.3 Magnetic Field Lines and Magnetic Field. 6.4 Force and Torque on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetic Field. 7.1 Magnetic Field Lines and Magnetic Media. 7.3 Magnetic Field Lines and Magnetic Media. 7.3 Magnetic Field Lines and Magnetism. 7.5 Ferromagnetism. 7.5 Ferromagnetism. 7.5 Ferromagnetism. 7.5 Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1 Induction Experiments. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 8.7 Magnetic-Field Energy.	1 ELECTRIC CHARGE AND ELECTRIC FIELD	1.1 Electric Charge.
1.4 - Electric Field Calculations. 1.6 - Electric Field Calculations. 1.6 - Electric Field Calculations. 1.6 - Electric Field Calculations. 1.7 - Electric Dipoles. 2.1 - Charge and Electric Flux. 2.2 - Calculating Electric Flux. 2.3 - Gauss's Law. 2.4 - Applicating Electric Flux. 2.3 - Gauss's Law. 2.5 - Conductors in Electrostatic Equilibrium. 3.1 - Electric Potential Energy. 3.2 - Electric Potential Energy. 3.3 - Calculating Electric Potential Energy. 3.2 - Electric Potential Gradient. 3.3 - Educating Electric Potential. 3.4 - Equipotential Surfaces. 3.5 - Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4.1 - Capacitors and Capacitance. 4.2 - Capacitors in Series and Parallel. 4.3 - Energy Storage in Capacitors and Electric-Field Energy. 4.4 - Dielectrics in Series and Parallel. 4.3 - Energy Storage in Capacitors and Electric-Field Energy. 4.4 - Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5 - Gauss's Law in Dielectrics. 4.6 - Dielectric Corrent. 5.6 - Lectromotive Force and Circuits. 5.7 - Capacitors and Capacitance. 5.8 - Electromotive Force and Circuits. 5.9 - Energy and Power in Electrical Circuits. 5.9 - Energy and Power in Electrical Conduction. 6.1 - Magnetic Field. 6.2 - Motion of Charged Particles in a Magnetic Field. 6.3 - Magnetic Field Lines and Magnetic Field. 6.4 - Force and Torque on a Current Loop. 6.5 - Biot-Savarts Law. 6.6 - Magnetic Field Lines and Magnetic Field. 7.1 - Magnetic Substances and Magnetic Field. 8.1 - Inductance. 8.2 - Faraday-Lenz's Law. 8.3 - Induced Electric Fields. 8.4 - Eddy Currents. 8.5 - Hutal Inductance. 8.6 - Self-Inductance and Inductors. 8.7 - Magnetic Field Lines and State of a System. 9.4 - Equations of State. 9.5 - Thermodynamic Systems and Classification. 9.3 - State Variables and State of a System. 9.4 - Equations of State. 9.5 - Thermodynamic Systems and Classification. 9.6 - Change of State. Transformation or Process. 9.7 - Thermodynamic Systems and Thermodynamics, and Temperature. 10.2 - Thermometers and Temperature Scale		1.2 Conductors, Insulators and Induced Charges.
1.5 - Electric Field Clack 1.7 - Electric Dipoles. 1.7 - Electric Dipoles. 2 GAUSS'S LAW 2.1 - Charge and Electric Flux. 2.2 - Calculating Electric Flux. 2.3 - Gauss'S Law. 2.4 - Applications of Gauss'S Law. 2.5 - Conductors in Electrostatic Equilibrium. 3.1 - Electric Potential. 3.1 - Electric Potential. 3.2 - Electric Potential. 3.3 - Calculating Electric Potential. 3.4 - Equipotential Surfaces. 3.5 - Potential Gradient. 4 - CAPACITANCE AND DIELECTRICS 4.1 - Capacitors and Capacitance. 4.2 - Capacitors and Capacitance. 4.3 - Energy Storage in Capacitors and Electric-Field Energy. 4.5 - Mercy Storage in Capacitors and Electric-Field Energy. 4.5 - Gauss'S Law in Dielectrics. 4.6 - Dielectric Constant and Permittivity. 5 - CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 - Electric Current. 5.2 - Current and Current Density. 5.3 - Ohm'S Law and Resistance. 5.4 - Electromotive Force and Circuits. 5.5 - Energy and Power in Electrical Conduction. 6 - MAGNETIC FIELD 6 - MAGNETIC FIELD 6 - Magnetic Field. 6 - Magnetic Field Corrent Current. 6 - Proce and Torque on a Current Loop. 6 - Biot-Savar's Law. 6 - Magnetic Field Lines and Magnetic Field. 7 - Ampère s Law. 7 - MAGNETIC FIELD IN MATTER 7 - Ampère s Law. 7 - Magnetic Field Lines and Magnetization Vector. 7 - Ampère s Law. 8 - Electromotive S Law. 9 - Thermodynamic Systems 9 - Thermodynamic Systems and Classification. 9 - Thermodynamic Systems and Thermodynamics, and Temperature. 10 - Temperature Sales. 10 - Temperature Sales. 10 - T		
1.6 - Electric Field Lines 1.7 - Electric Dipoles 2 GAUSS'S LAW 2.1 - Charge and Electric Flux, 2.3 - Gauss's Law, 2.4 - Applications of Gauss's Law, 2.5 - Conductors in Electrostatic Equilibrium. 3.5 - Electric Potential Energy, 3.5 - Electric Potential Energy, 3.6 - Electric Potential Energy, 3.7 - Electric Potential Energy, 3.8 - Equipolity Following Electrostatic Equilibrium. 3.9 - Electric Potential Surfaces, 3.9 - Potential Gradient, 4.1 - Capacitorial Surfaces, 3.5 - Potential Gradient, 4.2 - Capacitors and Capacitance, 4.3 - Energy Storage in Capacitors and Electric-Field Energy, 4.4 - Dielectrics, Molecular Model of Induced Charge, and Polarization Vector, 4.5 - Gauss's Law in Dielectrics, 4.6 - Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 - Electric Current. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 - Electric Current. 5.2 - Current and Current Density, 5.3 - Ohm's Law and Resistance. 5.4 - Electromotive Force and Circuits, 5.5 - Energy and Power in Electrical Conduction. 6 Magnetic Field. 6 Magneti		
2.1 - Charge and Electric Flux. 2.2 - Calculating Electric Flux. 2.3 - Gauss's Law. 2.5 - Conductors in Electrostatic Equilibrium. 3 ELECTRIC POTENTIAL 3.1 - Electric Potential Energy. 3.2 - Electric Potential. 3.3 - Calculating Electric Potential. 3.4 - Equipotential Surfaces. 3.5 - Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4.1 - Capacitors and Capacitance. 4.2 - Capacitors and Capacitance. 4.3 - Energy Storage in Capacitance and Electric-Field Energy. 4.4 - Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5 - Gauss's Law in Dielectrics. 4.6 - Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 - Electric Current. 5.2 - Current and Current Density, 5.3 - Ohm's Law and Resistance. 5.4 - Electromotive Force and Circuits. 5.5 - Basic Theory of Electrical Circuits. 5.5 - Basic Theory of Electrical Circuits. 5.6 - Basic Theory of Electrical Circuits. 6.1 - Magnetic Field. 6.2 - Motion of Charged Particles in a Magnetic Field. 6.3 - Magnetic Field Lines and Magnetic Flux. 6.7 - Ampère's Law. 6.6 - Magnetic Field Lines and Magnetic Flux. 6.7 - Ampère's Law. 7 Ampère's Law. 8 ELECTROMAGNETIC INDUCTION 8 Line Capacitance and Inductors. 8 ELECTROMAGNETIC INDUCTION 8 Line Capacitance and Inductors. 8 ELECTROMAGNETIC INDUCTION 8 Line Capacitance and Inductors. 8 Field Capacitance and Inductors. 8 Self-Inductance. 8 Self-Inductance. 8 Self-Inductance and Inductors. 9 THERMODYNAMIC SYSTEMS 9 THERMODYNAMIC SYSTEMS 10 Thermodynamic Systems and Classification. 9 State Variables and State of a System. 9 Thermodynamic Systems and Classification or Process. 9 Thermodynamic Equilibrium. 9 Charge of State, Transformation or Process. 9 Thermodynamic Equilibrium. 9 Charge of State, Transformation or Process. 9 Thermodynamic Systems and Classification. 10 Thermodynamic Systems and Classification. 10 Thermometers and Temperature Scales.		
2.2. Calculating Electric Flux. 2.3. Gauss's Law. 2.4. Applications of Gauss's Law. 2.5. Conductors in Electrostatic Equilibrium. 3. ELECTRIC POTENTIAL 3.1. Electric Potential Energy. 3.2. Electric Potential. 3.3. Calculating Electric Potential. 3.4. Equipotential Surfaces. 3.5. Potential Gradient. 4. CAPACITANCE AND DIELECTRICS 4.1. Capacitors and Capacitors and Electric-Field Energy. 4.2. Capacitors in Series and Parallel. 4.3. Energy Storage in Capacitors and Electric-Field Energy, 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6. MAGNETIC FIELD 6.1. Magnetic Field Conduction. 6.2. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Currying Conductor. 6.4. Force and Torque on a Current Currying Conductor. 6.5. Amperic Field Lines and Magnetic Flux. 6.7. Ampere's Law. 6.8. Biol-Savarts Law. 6.9. Ampere's Law. 7.1. Magnetic Field Lines and Magnetization Vector. 7.2. Ampere's Law in Magnetic Media. 7.3. Magnetic Succeptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic Field Energy. 9. THERMODYNAMIC SYSTEMS 9. THERMODYNAMIC SYSTEMS 10.1. Thermodynamics of State. 9.5. Thermodynamics of State. 9.5. Thermodynamics of State. 9.5. Thermodynamics of State. 9.6. Thermodynamics of State. 9.6. Thermodynamics of State. 9.7. Quasi-static Processes. 9.8. State Variables and State of a System. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.		1.7 Electric Dipoles.
2.3. Gauss's Law. 2.4. Applications of Gauss's Law. 2.5. Conductors in Electrostatic Equilibrium. 3.1 ELECTRIC POTENTIAL 3.1. ELECTRIC Potential Energy. 3.2. Electric Potential Electric Potential. 3.3. Calculating Electric Potential. 3.4. Equipotential Surfaces. 3.5. Potential Gradient. 4.1. Capacitors and Capacitance. 4.2. Capacitors and Capacitance. 4.2. Capacitors and Capacitance and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. Gauss's Law and Resistance. 5.4. Electromotive Fore and Circuits. 5.5. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Fore and Circuits. 5.5. Energy and Power in Electrical Conduction. 6. Magnetic Field Conduction. 6.1. Magnetic Fore on a Current-Cardying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biol. Sayant's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Amper's Law. 6.8. Magnetic Field Lines and Magnetic Flux. 6.7. Amper's Law. 8. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8. Provided Electric Fields. 8. Mutual Inductance. 8. Mutual Inductance. 8. Mutual Inductance. 8. Mutual Inductance. 9. Thermodynamic Systems and Classification. 9. Change of State, Transformation or Process. 9. Thermodynamic Systems and Process Prunctions. 10. Thermometers and Temperature Scales. 10. Hermometers and Temperature Scales.	2 GAUSS'S LAW	2.1 Charge and Electric Flux.
2.4. Applications of Gauss's Law. 2.5. Conductors in Electrostatic Equilibrium. 3.1. Electric Potential Energy. 3.2. Electric Potential. 3.4. Equipotential Surfaces. 3.5. Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4.1. Capacitors and Capacitance. 4.2. Capacitors in Series and Parallel. 4.3. Energy Storage in Capacitors and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. 6.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.5. Energy and Power in Electrical Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Circuits. 5.6. Basic Theory of Electrical Circuits. 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Field Circe and Circuit Loop. 6.5. Biot-Savart's Law. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetization Vector. 7.2. Amprère's Law in Magnetic Magnetic Magnetic Magnetic Flux. 7.3. Magnetic Succeptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8. 1. Induction Experiments. 8. 2. Faraday-Len's Law. 8. 3. Induced Electric Fields. 8. 4. Eddy Currents. 8. 5. Mutual Inductance. 8. 6. Self-Inductance and Inductors. 8. 7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9. THERMODYNAMIC SYSTEMS 9. THERMODYNAMIC SYSTEMS 10. 1. Thermodynamic Systems and Classification. 9. 3. State Variables and State of a System. 9. Change of State, Transformation or Process. 9. State and Process Functions. 10. Temperature. 10. 2. Thermometers and Temperature Scales.		
2.5. Conductors in Electrostatic Equilibrium. 3. ELECTRIC POTENTIAL 3.1. Electric Potential Energy. 3.2. Electric Potential. 3.3. Calculating Electric Potential. 3.4. Equipotential Surfaces. 3.5. Potential Gradient. 4. CAPACITANCE AND DIELECTRICS 4.1. Capacitors and Capacitance. 4.2. Capacitors and Capacitance. 4.2. Capacitors and Eapacitance and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. Gauss's Law and Resistance. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current Loop. 6.5. Blot Savar's Law. 6.6. Magnetic Force on a Current Loop. 6.5. Blot Savar's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Amper's Law. 6.8. Agnetic Field Lines and Magnetic Flux. 6.7. Amper's Law. 8. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 9. THERMODYNAMIC SYSTEMS 10.1. Thermodynamic Equilibrium, 9. Change of State, Transformation or Process. 9. Quasi-static Processes. 9. Thermodynamic Equilibrium, 9. Change of State, Transformation or Process. 9. Quasi-static Processes. 9. Change of State, Transformation or Process. 9. Thermodynamic Systems and Process. 9. Thermodynamics and Processes. 10. Lancetime and Processes.		
3 Electric Potential. 3 Calculating Electric Potential. 3 Calculating Electric Potential. 3 Equipotential Surfaces. 3 Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4 Capacitors and Capacitors. 4 Capacitors and Capacitors and Electric-Field Energy. 4 Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4 Gauss's Law in Dielectrics. 4 Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4 Gauss's Law in Dielectrics. 4 Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 Electric Current. FORCE 5 Current and Current Density. 5 Current and Current Density. 5 Current and Current Density. 5 Density Law and Resistance. 5 Energy and Power in Electrical Circuits. 5 Energy and Power in Electrical Circuits. 5 Energy and Power in Electrical Circuits. 5 Energy and Power in Electrical Conduction. 6 Magnetic Field. 6 Magnetic Field. 6 Magnetic Field Lines and Magnetic Field. 6 Force and Torque on a Current Loop. 6 Biot-Savart's Law, 6 Magnetic Field Lines and Magnetic Fiux. 7 Magnetic Field Lines and Magnetic Fiux. 7 Ampère's Law in Magnetic Substances and Magnetization Vector. 7 Ampère's Law in Magnetic Media. 7 Ampère's Law in Magnetic Field. 8 Faraday-Lenz's Law. 9 THERMODYNAMIC SYSTEMS 10 Tempordynamic Systems and Classification. 9 State Variables and State of a System. 9 Change of State, Transformation or Process. 9 Thermodynamic Equilibrium, 9 Change of State, Transformation or Process. 9 Thermodynamic Equilibrium. 10 Thermoders and Temperature Scales.		
3.2 Electric Potential. 3.3. Calculating Electric Potential. 3.4 Equipotential Surfaces. 3.5 Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4.1 Capacitors and Capacitars and Parallel. 4.2 Capacitors in Series and Parallel. 4.3 Energy Storage in Capacitors and Electric-Field Energy. 4.4 Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5 Gauss's Law in Dielectrics. 4.6 Dielectric Cornstant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 Electric Current. FORCE 5.2 Current and Current Density. 5.3 Ohm's Law and Resistance. 5.4 Electromotive Force and Circuits. 5.5 Energy and Power in Electrical Circuits. 5.6 Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1 Magnetic Field 6.2 Motion of Charged Particles in a Magnetic Field. 6.3 Magnetic Force on a Current-Carrying Conductor. 6.4 Force and Torque on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetic Flux. 6.7 Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1 Magnetic State University of Paramagnetism. 7.2 Ampère's Law in Magnetic Media. 7.3 Magnetic State University of Paramagnetism. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism 8 ELECTROMAGNETIC INDUCTION 8.1 Induction Experiments. 8.2 Faraday-Lenz's Law. 8.3 Induction Experiments. 8.4 Eddy Currents. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 9.7 Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1 Classical Thermodynamics 9.2 Thermodynamic Systems and Classification. 9.3 State Variables and State of a System. 9.4 Equations of State, 9.5 Thermodynamic Equilibrium. 9.6 Change of State, Transformation or Process. 9.7 Quasi-static Processes. 9.8 State and Process Functions. 10.1 Thermofers and Temperature Scales.	2. ELECTRIC POTENTIAL	
3.3. Calculating Electric Potential. 3.4. Equipotential Surfaces. 3.5. Potential Gradient. 4. CAPACITANCE AND DIELECTRICS 4.1. Capacitors and Capacitors. 4.2. Capacitors and Parallel. 4.3. Energy Storage in Capacitors and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Penergy and Power in Electrical Circuits. 5.5. Penergy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law in Magnetic Media. 7.3. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law. 8. Harmagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8. 1. Induction Experiments. 8. 2. Faraday-Lenz's Law. 8. 3. Inducted Electric Fields. 8. 4. Eddy Currents. 8. 5. Mutual Inductance. 8. 6. Self-Inductance and Inductors. 8. 7. Magnetic Field Energy. 9. THERMODYNAMIC SYSTEMS 9. State Variables and State of a System. 9. 4. Equations of State. 9. 5. Thermodynamic Systems and Classification. 9. 5. State Variables and State of a System. 9. 4. Equations of State. 9. 5. Thermodynamic Equilibrium. 9. 6. Change of State, Transformation or Process. 9. 7. Ouasi-static Processes. 9. 8. State and Process Functions. 10. Thermodres and Temperature Scales.	3 ELECTRIC POTENTIAL	
3.4 - Equipotential Surfaces. 3.5 - Potential Gradient. 4 CAPACITANCE AND DIELECTRICS 4.1 - Capacitors and Capacitance. 4.2 - Capacitors in Series and Parallel. 4.3 - Energy Storage in Capacitors and Electric-Field Energy. 4.4 - Dielectric, Molecular Model of Induced Charge, and Polarization Vector. 4.5 - Gauss's Law in Dielectrics. 4.6 - Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 - Electric Current. 5.2 - Current and Current Density. 5.3 - Ohm's Law and Resistance. 5.4 - Electromotive Force and Circuits. 5.5 - Energy and Power in Electrical Circuits. 5.6 - Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1 - Magnetic Field. 6.2 - Motion of Charged Particles in a Magnetic Field. 6.3 - Magnetic Force on a Current-Carrying Conductor. 6.4 - Force and Torque on a Current-Carrying Conductor. 6.5 - Biot-Savart's Law. 6.6 - Magnetic Field Lines and Magnetic Flux. 6.7 - Ampère's Law in Magnetic Media. 7 Magnetic Substances and Magnetization Vector. 7.2 - Ampère's Law in Magnetic Media. 7.3 - Magnetic Substances and Magnetism. 7.5 - Ferromagnetism and Diamagnetism. 7.5 - Ferromagnetism and Diamagnetism. 7.6 - Faraday-Len's Law. 8.7 - Magnetic Field Electric Fields. 8.8 - ELECTROMAGNETIC INDUCTION 8.1 - Induction Experiments. 8.2 - Faraday-Len's Law. 8.3 - Induced Electric Fields. 8.4 - Eddy Currents. 8.5 - Mutual Inductance. 8.6 - Self-Inductance and Inductors. 8.7 - Magnetic Steld Energy. 9 THERMODYNAMIC SYSTEMS 9.1 - Classical Thermodynamics. 9.2 - Thermodynamic Equilibrium. 9.4 - Equations of State. 9.5 - Thermodynamic Equilibrium. 9.6 - Change of State, Transformation or Process. 9.7 - Quasi-static Processes. 9.8 - State and Process Functions. 10.1 - TEMPERATURE AND HEAT 10.2 - Thermometers and Temperature Scales. 10.3 - Ideal Cas Thermometers and the Kelvin Scale.		
3.5. Potential Gradient. 4.1. Capacitors and Capacitance. 4.2. Capacitors in Series and Parallel. 4.3. Energy Storage in Capacitors and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Porce and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Moltion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Hagnetic Substances and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Cystems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Systems and Classification. 9.6. Change of State. 9.7. Thermodynamic Equilibrium. 9.6. Change of State. 9.7. Thermodynamics and Process Functions. 9.8. State and Process Functions. 9.9. Thermodynamics and Process and Temperature Scales. 10.2. Thermometers and the Kelvin Scale.		
4.1 Capacitors and Capacitance. 4.2 Capacitors in Series and Parallel. 4.3 Energy Storage in Capacitors and Electric-Field Energy. 4.4 Dielectric, Molecular Model of Induced Charge, and Polarization Vector. 4.5 Gauss's Law in Dielectrics. 4.6 Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 Electric Current. FORCE 5.2 Current and Current Density. 5.3 Ohm's Law and Resistance. 5.4 Electromotive Force and Circuits. 5.5 Energy and Power in Electrical Circuits. 5.6 Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1 Magnetic Field. 6.2 Moltion of Charged Particles in a Magnetic Field. 6.3 Magnetic Force on a Current-Carrying Conductor. 6.4 Force and Torque on a Current-Carrying Conductor. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetization Vector. 7.2 Ampère's Law. 7 Magnetic Field Lines and Magnetization Vector. 7.2 Ampère's Law in Magnetic Media. 7.3 Magnetic Sucseptibility and Permeability. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8 Linduction Experiments. 8 Faraday-Lenz's Law. 8 Faraday-Lenz's		
4.2. Capacitors in Series and Parallel. 4.3. Energy Storage in Capacitors and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Magnetic Field. 6.3. Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law. 7.3. Magnetic Substances and Magnetization Vector. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Faraday-Lenz's Law. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Systems and Classification. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions. 10.1. Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2. Thermometers and Temperature Scales.	4 CAPACITANCE AND DIELECTRICS	
4.3. Energy Storage in Capacitors and Electric-Field Energy. 4.4. Dielectrics, Molecular Model of Induced Charge, and Polarization Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Field. 6.3. Magnetic Field. 6.4. Force and Torque on a Current-Carrying Conductor. 6.4. Force and Torque on a Current-Lopp. 6.5. Biot-Savar's Law. 6.6. Magnetic Field Lines and Magnetiz Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetiz Flux. 6.7. Ampère's Law in Magnetic Media. 7.3. Magnetic Sustances and Diamagnetism. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-inductance and Inductors. 9.7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics ystems and Classification. 9.3. State Variables and State of a System. 9.4. Fequations of State, 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Puas-Istatic Processes. 9.8. State and Process Functions. 10.1. Thermodynamic Equilibrium, 10.2. Thermodynamic Equilibrium, 10.3. Thermodynamics and Temperature Scales. 10.3. Ideal Gas Thermometers and the Kelvin Scale.		
Vector. 4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Current. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current-Carrying Conductor. 6.4. Force and Torque on a Current-Carrying Conductor. 6.5. Biot-Savar's Law. 6.6. Magnetic Field Lines and Magnetization Vector. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9. Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Ouasi-Static Processes. 9.8. State and Process Functions. 10.1. Thermodynamic Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2. Thermodynames and Temperature Scales. 10.3. Ideal Gas Thermometers and the Kelvin Scale.		
4.5. Gauss's Law in Dielectrics. 4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current. FORCE 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics 9.2. Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions.		
4.6. Dielectric Constant and Permittivity. 5. CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1. Electric Current 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6. MAGNETIC FIELD 6. Magnetic Field 6. Magnetic Field 6. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7. Magnetic Substances and Magnetization Vector. 7. Ampère's Law. 7. Magnetic Substances and Magnetization Vector. 7. Ampère's Law in Magnetic Media. 7. Magnetic Substances and Diamagnetism. 7. Ferromagnetism and Diamagnetism. 7. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8. 1. Induction Experiments. 8. 2. Faraday-Lenz's Law. 8. 3. Induced Electric Fields. 8. 4. Eddy Currents. 8. Mutual Inductance. 8. 6. Self-Inductance and Inductors. 8. 7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9. Thermodynamic Systems and Classification. 9. State Variables and State of a System. 9. Equations of State. 9. Transformation or Process. 9. Tempodynamic Systems and Temperature. 9. Change of State, Transformation or Process. 9. To Quasi-static Processes. 9. State and Processes. 9. State of a Thermodynamics, and Temperature. 10. Thermometers and Temperature Scales. 10. Thermometers and Temperature Scales.		
5 CURRENT, RESISTANCE, AND ELECTROMOTIVE 5.1 Electric Current. 5.2. Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4 Electromotive Force and Circuits. 5.5 Energy and Power in Electrical Circuits. 5.6 Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1 Magnetic Field. 6.2 Motion of Charged Particles in a Magnetic Field. 6.3 Magnetic Force on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetic Flux. 6.7 Ampère's Law. 6.6 Magnetic Substances and Magnetization Vector. 7.2 Ampère's Law in Magnetic Media. 7.3 Magnetic Susceptibility and Permeability. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1 Induction Experiments. 8.2 Faraday-Lenz's Law. 8.3 Induced Electric Fields. 8.4 Eddy Currents. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 8.7 Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics. 9.2 Thermodynamic Systems and Classification. 9.3 State Variables and State of a System. 9.4 Equations of State. 9.5 Thermodynamic Equilibrium. 9.6 Change of State, Transformation or Process. 9.7 Quasi-static Processes. 9.8 State and Processe Functions. 10.1 Thermometers and Temperature Scales. 10.2 Thermometers and Temperature Scales.		
FORCE 5.2 Current and Current Density. 5.3. Ohm's Law and Resistance. 5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism and Diamagnetism. 7.5. Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics. 9.2. Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions. 10 TEMPERATURE AND HEAT 10.1. Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2 Thermometers and Temperature Scales.		
5.3 Ohm's Law and Resistance. 5.4 Electromotive Force and Circuits. 5.5 Energy and Power in Electrical Circuits. 5.6 Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1 Magnetic Field. 6.2 Motion of Charged Particles in a Magnetic Field. 6.3 Magnetic Force on a Current-Carrying Conductor. 6.4 Force and Torque on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetic Flux. 6.7 Ampère's Law in Magnetic Flux. 6.7 Ampère's Law in Magnetic Media. 7.3 Magnetic Substances and Magnetization Vector. 7.2 Ampère's Law in Magnetic Media. 7.3 Magnetic Susceptibility and Permeability. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1 Induction Experiments. 8.2 Faraday-Lenz's Law. 8.3 Induced Electric Fields. 8.4 Eddy Currents. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 8.7 Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1 Classical Thermodynamics. 9.2 Thermodynamic Systems and Classification. 9.3 State Variables and State of a System. 9.4 Equations of State. 9.5 Thermodynamic Equilibrium. 9.6 Change of State, Transformation or Process. 9.7 Quasi-static Processes. 9.8 State and Process Functions. 10 Thermoeters and Temperature Scales. 10.2 Thermometers and Temperature Scales.		
5.4. Electromotive Force and Circuits. 5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savari's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics. 9.2. Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions. 10.1. Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2. Thermometers and Temperature Scales. 10.3. Ideal Gas Thermometers and the Kelvin Scale.	FORCE	
5.5. Energy and Power in Electrical Circuits. 5.6. Basic Theory of Electrical Conduction. 6 MAGNETIC FIELD 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Sucseptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics. 9.2. Thermodynamics. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions. 10.1. Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2. Thermometers and Temperature Scales. 10.3. Ideal Gas Thermometers and the Kelvin Scale.		
5.6. Basic Theory of Electrical Conduction. 6.1. Magnetic Field. 6.2. Motion of Charged Particles in a Magnetic Field. 6.3. Magnetic Force on a Current-Carrying Conductor. 6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7. MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8. ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9. THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics. 9.2. Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions. 10 TEMPERATURE AND HEAT 10.1. Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2. Thermometers and Temperature Scales. 10.3. Ideal Gas Thermometers and the Kelvin Scale.		
6 MAGNETIC FIELD 6.1 Magnetic Field. 6.2 Motion of Charged Particles in a Magnetic Field. 6.3 Magnetic Force on a Current-Carrying Conductor. 6.4 Force and Torque on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetiz Flux. 6.7 Ampère's Law. 7.1 Magnetic Substances and Magnetization Vector. 7.2 Ampère's Law in Magnetization Vector. 7.3 Magnetic Susceptibility and Permeability. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism and Diamagnetism. 7.5 Ferromagnetism. 8.1 Induction Experiments. 8.2 Faraday-Lenz's Law. 8.3 Induced Electric Fields. 8.4 Eddy Currents. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 8.7 Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1 Classical Thermodynamics. 9.2 Thermodynamic Systems and Classification. 9.3 State Variables and State of a System. 9.4 Equations of State. 9.5 Thermodynamic Equilibrium. 9.6 Change of State, Transformation or Process. 9.7 Quasi-static Processes. 9.8 State and Process Functions. 10 TEMPERATURE AND HEAT 10.1 Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2 Thermoderers and Temperature Scales. 10.3 Ideal Gas Thermometers and the Kelvin Scale.		
6.2 Motion of Charged Particles in a Magnetic Field. 6.3 Magnetic Force on a Current-Carrying Conductor. 6.4 Force and Torque on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetic Flux. 6.7 Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1 Magnetic Substances and Magnetization Vector. 7.2 Ampère's Law in Magnetic Media. 7.3 Magnetic Susceptibility and Permeability. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1 Induction Experiments. 8.2 Faraday-Len2's Law. 8.3 Induced Electric Fields. 8.4 Eddy Currents. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 8.7 Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1 Classical Thermodynamics. 9.2 Thermodynamic Systems and Classification. 9.3 State Variables and State of a System. 9.4 Equations of State. 9.5 Thermodynamic Equilibrium. 9.6 Change of State, Transformation or Process. 9.7 Quasi-static Processes. 9.8 State and Process Functions. 10 TEMPERATURE AND HEAT 10.1 Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2 Thermometers and Temperature Scales. 10.3 Ideal Gas Thermometers and the Kelvin Scale.	6 - MAGNETIC FIELD	
6.3 Magnetic Force on a Current-Carrying Conductor. 6.4 Force and Torque on a Current Loop. 6.5 Biot-Savart's Law. 6.6 Magnetic Field Lines and Magnetic Flux. 6.7 Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1 Magnetic Substances and Magnetization Vector. 7.2 Ampère's Law in Magnetic Media. 7.3 Magnetic Susceptibility and Permeability. 7.4 Paramagnetism and Diamagnetism. 7.5 Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1 Induction Experiments. 8.2 Faraday-Lenz's Law. 8.3 Induced Electric Fields. 8.4 Eddy Currents. 8.5 Mutual Inductance. 8.6 Self-Inductance and Inductors. 8.7 Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1 Classical Thermodynamics. 9.2 Thermodynamic Systems and Classification. 9.3 State Variables and State of a System. 9.4 Equations of State. 9.5 Thermodynamic Equilibrium. 9.6 Change of State, Transformation or Process. 9.7 Quasi-static Processes. 9.8 State and Process Functions. 10 TEMPERATURE AND HEAT 10.1 Thermal Equilibrium, The Zeroth Law of Thermodynamics, and Temperature. 10.2 Thermometers and Temperature Scales. 10.3 Ideal Gas Thermometers and Temperature Scales.	U. MAGNETIC FILLD	
6.4. Force and Torque on a Current Loop. 6.5. Biot-Savart's Law. 6.6. Magnetic Field Lines and Magnetic Flux. 6.7. Ampère's Law. 7 MAGNETIC FIELD IN MATTER 7.1. Magnetic Substances and Magnetization Vector. 7.2. Ampère's Law in Magnetic Media. 7.3. Magnetic Susceptibility and Permeability. 7.4. Paramagnetism and Diamagnetism. 7.5. Ferromagnetism. 8 ELECTROMAGNETIC INDUCTION 8.1. Induction Experiments. 8.2. Faraday-Lenz's Law. 8.3. Induced Electric Fields. 8.4. Eddy Currents. 8.5. Mutual Inductance. 8.6. Self-Inductance and Inductors. 8.7. Magnetic-Field Energy. 9 THERMODYNAMIC SYSTEMS 9.1. Classical Thermodynamics. 9.2. Thermodynamic Systems and Classification. 9.3. State Variables and State of a System. 9.4. Equations of State. 9.5. Thermodynamic Equilibrium. 9.6. Change of State, Transformation or Process. 9.7. Quasi-static Processes. 9.8. State and Process Functions. 10.1. Thermometers and Temperature Scales. 10.2. Thermometers and Temperature Scales.		
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10.5 Calorimetry and Heat Capacities.		10.5 Calorimetry and Heat Capacities.

11 THE FIRST LAW OF THERMODYNAMICS	 11.1 Work. 11.2 Work Done During Volume Changes. 11.3 Internal Energy. 11.4 The First Law of Thermodynamics. 11.5 Internal Energy of an Ideal Gas. 11.6 Molar Heat Capacities of an Ideal Gas. 11.7 Adiabatic, Isothermal, Isobaric and Isochoric Processes for an Ideal Gas. 11.8 Enthalpy.
12 THE SECOND LAW OF THERMODYNAMICS	12.1 Directions of Thermodynamic Processes. 12.2 Heat Engines, Refrigerators, and Heat Pumps. 12.3 The Second Law of Thermodynamics: Clausius and Kelvin-Planck Statements. 12.4 Carnot Engine. 12.5 Carnot Theorems. 12.6 Thermodynamic Temperature. 12.7 Entropy. 12.8 Increase of Entropy Principle. 12.9 Entropy Change of an Ideal Gas.
LABORATORY	 1 How to Use a Multimeter. Ohm's Law. Direct Current. Circuit with Resistors. 2 Linear and Non-Linear Conductors. 3 Charge and Discharge of a Capacitor. 4 Analysis of a Parallel Plate Capacitor with Dielectrics. 5 Utilization of an Oscilloscope to Analyze Charge and Discharge Processes. 6 Study of the Magnetic Field. Helmholtz Coils. Magnetic Moment. Hall Effect. 7 Calorimetry. Water Equivalent of Calorimeter. Latent Heat of Fusion. 8 Thermodynamics of the Ideal Gas. Heat Capacity Ratio. Adiabatic Work.
LABORATORY: UNSTRUCTURED ACTIVITY (OPEN LAB) SESSIONS	Unstructured activity (open lab) sessions that cover the topics of the above cited regular laboratory sessions. A practical problem will be assigned to each team. Then, under the teacher's supervision, each team must analyse the problem, select a theoretical model and experimental means to obtain a solution.

Class hours	Hours outside the classroom	Total hours
24.5	45	69.5
8	20	28
18	18	36
1	0	1
3.5	0	3.5
3	0	3
l practices 0	9	9
	24.5 8 18 1 3.5	classroom 24.5 45 8 20 18 18 1 0 3.5 0 3 0

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
	Description
Lecturing	Lectures are given by the teacher on the contents of the subject, theoretical bases and / or
	guidelines of a work, exercise or project to be performed by the students.
Problem solving	Activity in which problems and / or exercises related to the subject are formulated. The student
	must develop the appropriate or correct solutions through the repetition of routines, the application
	of formulas or algorithms, the application of procedures for transforming the available information
	and the interpretation of the results. It is usually used as a complement to the lecture sessions.
Laboratory practical	Activities for applying the knowledge to particular situations and for the acquisition of basic and
	procedural skills related to the subject. They are developed in dedicated rooms with specialized
	equipment (laboratories, computer rooms, etc.).

Personalized assistance	
Methodologies	Description
Lecturing	In office hours.
Laboratory practical	In office hours.
Problem solving	In office hours.

Tests	Description
Objective questions exam	In office hours.
Problem and/or exercise solving	In office hours.
Essay questions exam	In office hours.
Report of practices, practicum and external practices	In office hours.

Assessment			
	Description	Qualification	Training and Learning Results
Objective questions exam	Tests for the assessment of acquired knowledge that include closed questions with different response options (true/false, multiple choice, matching of elements). Students select a response among a limited number of choices.	10	B3 C2
Problem and/or exercise solving	Test in which the student must solve a series of problems and / or exercises in a time / conditions set by the teacher. In this way, the student should apply the acquired knowledge.	50	B3 C2 D2
Essay questions exam	Tests that include open questions on a topic. Students should develop, relate, organize and present knowledge on the subject in an argued response.	30	B3 C2
Report of practices, practicum and external practices	Preparation of a report by the students which reflects the characteristics of the work that has been carried out. Students must describe the developed tasks and procedures, show the results or observations made, as well as the data analysis and processing.	10	B3 C2 D9 D10

Other comments on the Evaluation

1. CONTINUOUS ASSESSMENT (EC)

Continuous assessment (denoted EC) comprises the mark ECA on the topics covered in the lectures, with a weight of 80% in the final mark, and the mark ECL on the laboratory topics, with a weight of 20% in the final mark: EC = ECA (80%) + ECL (20%).

In the ordinary exam, the mark ECA will be evaluated by means of tests to be taken during the course, with a weight of 40% in the final mark (mark ECC1), and a final test, with a weight of 40% in the final mark (mark ECF1). The mark scheme for the extraordinary exam will be the same as for the ordinary one so that it will comprise two tests, ECC2 and ECF2, equivalent in content and evaluation methodology (objective questions, essay questions and problem solving) to ECC1 and ECF1, respectively.

The mark ECL will be evaluated by means of practices reports, with a weight of 10% in the final mark (mark ECLI), and tests, with a weight of 10% in the final mark (mark ECLE). It is mandatory the attendance to all lab sessions to obtain the mark ECL, otherwise, the mark ECL will be 0.0.

Final mark EC for the continuous assessment modality:

- Ordinary exam: EC = ECC1 (40%) + ECF1 (40%) + ECLI (10%) + ECLE (10%).
- Extraordinary exam: EC = ECC2 (40%) + ECF2 (40%) + ECLI (10%) + ECLE (10%).

In the extraordinary exam, a student who has previously obtained marks ECC1 or EFC1 (or both) can choose between: a) answering the exam(s) corresponding to mark ECC2 and/or mark EFC2, in such a way that the new mark ECC2 replaces ECC1 and/or the new mark ECF2 replaces ECF1, and b) maintaining mark ECC1 and/or mark ECF1 instead of taking the exam(s) corresponding to mark ECC2 and/or mark ECF2, respectively.

2. GLOBAL ASSESSMENT (EG)

Those students who have been granted the waiver of the continuous assessment have the possibility of taking a written global test to obtain a mark EG with a weight of 100% of the final mark. This test will include the following parts: a test on topics covered in the lectures, with a weight of 80% in the final mark (mark denoted EGA1 in the ordinary exam and EGA2 in the extraordinary exam), and a test on laboratory topics, with a weight of 20% in the final mark (mark denoted EGL1 in the ordinary exam and EGL2 in the extraordinary exam).

Final mark EG for the global assessment modality:

- Ordinary exam: EG = EGA1 (80%) + EGL1 (20%).
- Extraordinary exam: EG = EGA2 (80%) + EGL2 (20%).

In the extraordinary exam, a student who has previously obtained marks EGA1 or EGL1 (or both) can choose between: a) answering the exam(s) corresponding to mark EGA2 and/or mark EGL2, in such a way that the new mark EGA2 replaces EGA1 and/or the new mark EGL2 replaces EGL1, and b) maintaining mark EGA1 and/or mark EGL1 instead of taking the exam(s) corresponding to mark EGA2 and/or mark EGL2, respectively.

3. END-OF-PROGRAM EXAM (FC)

The end-of-program exam follows the same scheme as the global assessment EG.

Final mark FC for the end-of-program exam:

FC = FCA (80%) + FCL (20%).

4. GENERAL RULES

To pass the course, a student must obtain a final mark equal to or higher than 5 (out of 10).

Within the specifications detailed in the preceding sections, the tests and exams may consist of different variants within the same classroom or laboratory group.

Ethical commitment: Every student is expected to behave in an appropriate ethical manner. Should unethical conduct be detected (copying, plagiarism, utilisation of unauthorised electronic devices, or others), the student will be considered not to have fulfilled the necessary requirements to pass the subject. In this case, the final mark in the corresponding edition of the academic record for the subject will be "suspenso" (0.0).

Students should not have access to or use any electronic device during the tests and exams, unless specifically authorised. The mere fact of taking an unauthorised electronic device into the examination room will result in the student failing the subject and the final mark in the corresponding edition of the academic record for the subject will be "suspenso" (0.0).

Sources of information

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Complementary Bibliography

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Recommendations

Other comments

Basic recommendations:

- 1. Basic knowledge acquired in the subjects of Physics and Mathematics in previous courses.
- 2. Oral and written comprehension.
- 3. Capacity for abstraction, basic calculus, and synthesis of information.
- 4. Skills for group work and communication.

In the event of discrepancy, the Spanish version of this syllabus prevails.