GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR
(Established by State Legislature Act 17 of 1995)
'A+' Grade, NAAC Accredited State Govt. University

Acad./AC-III/BOS&R-12/2025/ 5145

Dated: 21/8/25

To

The Controller of Examinations
GJUS&T, Hisar.

Sub: Approval of following minor modifications/changes in the B.Sc. Physical Sciences programme as per NEP-2020 w.e.f. academic session 2025-26 being run in affiliated degree Colleges:

1. Minor change in the programme outcomes (POs) of B.Sc. Physical Sciences programme in affiliated degree Colleges.

2. Minor change in the exam hours of DSCs papers for scheme 'A' in B.Sc. (Physical Sciences) – 1st and 2nd semester and examinations hours for Minor Courses (MIN) for scheme 'C' in B.Sc. (Physical Sciences) – 1st and 2nd semester being run in affiliated degree Colleges.

I am directed to inform you that the Vice-Chancellor, on the recommendations of Dean, Faculty of Physical on 18.07.2025, is pleased to approve the minor modifications/changes in the programme outcomes (POs) of B.Sc. Physical Sciences programme in affiliated degree Colleges and minor change in the exam hours of DSCs papers for scheme 'A' in B.Sc. (Physical Sciences) – 1st and 2nd semester and examinations hours for Minor Courses (MIN) for scheme 'C' in B.Sc. (Physical Sciences) – 1st and 2nd semester being run in affiliated degree Colleges as minor modifications.

A copy of the scheme of examinations and syllabi of above said programme is enclosed herewith. You are therefore, requested to take further necessary action accordingly.

Yours faithfully

DA: As above

Assistant Registrar (Academic)
for Registrar

Endst. No. Acad./AC-III/BOS&R-20/2025/ 5146-65   Dated: 21/8/25

A copy of the above is forwarded to the following for information and necessary action:-

1. Dean, Faculty of Physical Sciences & Technology, GJUST, Hisar.

2. Chairperson, Department of Physics, GJUST, Hisar. He is requested to arrange to upload the minor modifications/changes in the programme outcomes (POs) of B.Sc. Physical Sciences programme in affiliated degree Colleges and Minor change in the exam hours of DSCs papers for scheme 'A' in B.Sc. (Physical Sciences) – 1st and 2nd semester and exam hours for Minor Courses (MIN) for scheme 'C' in B.Sc. (Physical Sciences) – 1st and 2nd semester being run in affiliated degree Colleges on the website of the University.

3. Principals, Concerned affiliated degree Colleges, GJUST, Hisar alongwith above said minor modifications/changes in the scheme of examinations and syllabi of subject of Physics in B.Sc. Physical Science being run by affiliated degree College(s).

4. OSD to Vice-Chancellor (for kind information of the Vice-Chancellor), GJUST, Hisar.

5. P.A to Registrar (for kind information of the Registrar), GJUST, Hisar.

Assistant Registrar (Academic)
for Registrar

Department of Physics

Scheme of Examination and Syllabus for Under Graduate Programme

Under Multiple Entry and Exit, Internship and
CBCS-LOCF as per NEP-2020
w.e.f. session 2025-26 (in phased manner)

Subject: Physics

**Guru Jambheshwar University of Science &Technology
Hisar-125001, Haryana**

(A+ NAAC Accredited State Govt. University)

Guru Jambheshwar University of Science and Technology

Hisar-125001, Haryana

('A+' NAAC Accredited State Govt. University)

Examination Scheme and Syllabus for B. Sc. Physical Science Programme w.e.f. session 2024-25
(For Affiliated Colleges according to National Education Policy-2020)

Subject-Physics

FIRST YEAR

SEMESTER-I

Type of Course	Course Code	Nomenclature of Paper/Course	Credits	Contact Hours	Internal Marks	External Marks	Total Marks	Duration of Exam (Hrs)
Discipline Specific Course (DSC)	C24PHY101T/ C24MIN101T	Mechanics	3	3	20	50	70	2.5
	C24PHY101P/ C24MIN101P	Mechanics Lab	1	2	10	20	30	3
Minor Course (MIC)	C24MIC133T	Fundamental of Electronics-I	2	2	15	35	50	2
Minor Course #	C24MIN101T/ C24PHY101T	Mechanics	3	3	20	50	70	2.5
	C24MIN101P/ C24PHY101P	Mechanics Lab	1	2	10	20	30	3
Multidisciplinary Course (MDC)	C24MDC123T	Fundamental of Physics-I	2	2	15	35	50	2
	C24MDC123P	Fundamental of Physics-I Lab	1	2	10	15	25	3
Skill Enhancement Course (SEC)	C24SEC130T	Instrumentation-I	2	2	15	35	50	2
	C24SEC130P	Instrumentation-I Lab	1	2	10	15	25	3
Value Added Course (VAC)	C24VAC119T	Electronic Components and Measuring Instruments	2	2	15	35	50	2

SEMESTER-II

Type of Course	Course Code	Nomenclature of Paper/Course	Credits	Contact Hours	Internal Marks	External Marks	Total Marks	Duration of Exam (Hrs)
Discipline Specific Course (DSC)	C24PHY201T/ C24MIN201T	Electricity and Magnetism	3	3	20	50	70	2.5
	C24PHY201P/ C24MIN201P	Electricity and Magnetism Lab	1	2	10	20	30	3
Minor Course (MIC)	C24MIC233T	Fundamental of Electronics-II	2	2	15	35	50	2
Minor Course #	C24MIN201T/ C24PHY201T	Electricity and Magnetism	3	3	20	50	70	2.5
	C24MIN201P/ C24PHY201P	Electricity and Magnetism Lab	1	2	10	20	30	3
Multidisciplinary Course (MDC)	C24MDC223T	Fundamental of Physics-II	2	3	15	35	50	2
	C24MDC223P	Fundamental of Physics-II Lab	1	3	10	15	25	3
Skill Enhancement Course (SEC)	C24SEC230T	Instrumentation-II	2	2	15	35	50	2
	C24SEC230P	Instrumentation-II Lab	1	2	10	15	25	3

Minor course for scheme C

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	Program Outcomes
PO1	Apply the basic principles of Physics to the events occurring around us.
PO2	Collaborate effectively on team-oriented projects/practical.
PO3	Try to find out or analyze scientific reasoning for various things and improve programming skills.
PO4	Develop scientific and logical thinking among the students.
PO5	Build effective communication skills through viva-voce or seminar.
PO6	Develop experimental skills and independent work culture through a series of experiments that compliment theories and projects.
PO7	Understand and solve problems of relevance to society to meet the specified needs using the knowledge, skills and attitudes acquired from physics.

Physics
Discipline Specific Course (DSC)
Mechanics (Semester I)

Paper Code: C24PHY101T/C24MIN101T
45 Hrs (3Hrs /week)
Credits: 3
Time: 2.5 Hrs

External Marks: 50
Internal Marks: 20
Total Marks: 70

Note: The examiner is required to set nine questions in all. The first question will be compulsory consisting of five short questions covering the entire syllabus consisting of 2 marks each. In addition to this, eight more questions (each question may be of 2-3 parts) will be set consisting of two questions from each unit. The student/candidate is required to attempt five questions in all selecting one from each unit in addition to the compulsory Question No.1. All questions carry equal marks. 20% numerical problems are to be set and use of scientific calculator (nonprogrammable) is allowed.

Unit-I

Fundamentals of Dynamics: Rigid body, Moment of Inertia, Radius of Gyration, Theorems of perpendicular and parallel axis (with proof), Moment of Inertia of ring, Disc, Angular Disc, Solid cylinder, Solid sphere, Hollow sphere, Torque, Rotational Kinetic Energy, Angular momentum, Law of conservation of angular momentum, rolling motion, condition for pure rolling, acceleration of body rolling down an inclined plane, Fly wheel, Moment of Inertia of an irregular body.

Unit-II

Elasticity: Deforming force, Elastic limit, stress, strain and their types, Hooke's law, Modulus of rigidity, Relation between shear angle and angle of twist, elastic energy stored/volume in an elastic body, Elongation produced in heavy rod due to its own weight and elastic potential energy stored in it, Tension in rotating rod, Poisson's ratio and its limiting value, Elastic Constants, and their relations. Torque required for twisting cylinder, bending of beam, bending moment and its magnitude, determination of elastic constants for material of wire by Searle's method.

Unit-III

Gravitation and central force motion: Law of gravitation, Gravitational potential energy, Inertial and gravitational mass, Potential and field due to spherical shell and solid sphere, Motion of a particle under a central force field, Two-body problem and its reduction to one-body problem and its solution, Differential Equation of motion with central force and its solution, Concept of power Law Potentials, Kepler's Laws of Planetary motion.

Unit-IV

Special Theory of Relativity: Michelson's Morley experiment and its outcomes, Postulates of special theory of relativity, Lorentz Transformations, Simultaneity and order of events, Lorentz contraction, Time dilation, Relativistic transformation of velocity, relativistic addition of velocities, variation of mass-energy equivalence, relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum, transformation of force.

Mechanics Lab

Paper Code: C24PHY101P/ C24MIN101P
30 Hrs (2 Hrs /week)
Credit: 1
Time: 3 Hrs

External Marks: 20
Internal Marks: 10
Total Marks: 30

Practical
1. Measurement of length (or diameter) using Vernier Caliper, screw gauge and travelling microscope.
2. To study the random error in observations.
3. To determine the area of window using a sextant.
4. Moment of Inertia of a Fly Wheel
5. Moment of Inertia of irregular body using a Torsion Pendulum.
6. Young's Modulus by Bending of Beam.
7. Modulus of rigidity of material of wire by Maxwell's Needle.
8. Elastic constants by Searle's method.

9. To determine the value of 'g' by using Bar pendulum.
10. To compare Moment of Inertia of a solid Sphere, Hollow Sphere, and solid Disc of same mass with the help of Torsion Pendulum.
11. To determine the bending moment of a cantilever beam with uniformly distributed load, uniformly varying load and point load.

Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination. Students are required to get minimum pass marks separately as per university rules in theory and practical components of the course.

Suggested Books:

1. Mechanics "Berkeley Physics Course Vol. I", Charles Kittel, Tata McGraw-Hill
2. Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
3. Elements of Properties of Matter, D.S. Mathur, S. Chand & Com. Pt. Ltd., New Delhi
4. Physics, Resnick, Halliday & Walker, Wiley
5. An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
6. B.Sc. Practical Physics, C.L. Arora, S. Chand Publisher, New Delhi

Course Outcomes (CO)

After completing this course, the student will be able to:

CO1. Understand the motion of rigid object along the surface, so that they can calculate moment of inertia, velocity, acceleration, total kinetic energy of an object that undergoing both translational and rotational motion and apply energy conservation in analyzing such motion.

CO2. Know about the basic concepts of elasticity, bending moment, torsional oscillations, and modulus of rigidity

CO3. Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

CO4. Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

CO5. Perform experiments on Properties of matter such as the determination of moduli of elasticity viz., Young's modulus, Rigidity modulus of certain materials; Sextant, Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values

Mapping of CO with PO
C24PHY101T/ C24MIN101T and C24PHY101P/ C24MIN101P

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M	M	M	S	S
CO2	S	M	M	M	M	S	S
CO3	S	M	M	M	M	S	S
CO4	S	M	M	M	M	S	S
CO5	S	M	S	M	M	S	S
	S	M	S	S	S	S	S

S= Strong, M = Medium, W= Weak

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Physics
Minor Course (MIN)
Mechanics (Semester I)

Paper Code: C24MIN101T/C24PHY101T
45 Hrs (3 Hrs /week)
Credits: 3
Time: 2.5 Hrs

External Marks: 50
Internal Marks: 20
Total Marks: 70

Note: The examiner is required to set nine questions in all. The first question will be compulsory consisting of five short questions covering the entire syllabus consisting of 2 marks each. In addition to this, eight more questions (each question may be of 2-3 parts) will be set consisting of two questions from each unit. The student/candidate is required to attempt five questions in all selecting one from each unit in addition to the compulsory Question No.1. All questions carry equal marks. 20% numerical problems are to be set and use of scientific calculator (nonprogrammable) is allowed.

Unit-I

Fundamentals of Dynamics: Rigid body, Moment of Inertia, Radius of Gyration, Theorems of perpendicular and parallel axis (with proof), Moment of Inertia of ring, Disc, Angular Disc, Solid cylinder, Solid sphere, Hollow sphere, Torque, Rotational Kinetic Energy, Angular momentum, Law of conservation of angular momentum, rolling motion, condition for pure rolling, acceleration of body rolling down an inclined plane, Fly wheel, Moment of Inertia of an irregular body.

Unit-II

Elasticity: Deforming force, Elastic limit, stress, strain and their types, Hooke's law, Modulus of rigidity, Relation between shear angle and angle of twist, elastic energy stored/volume in an elastic body, Elongation produced in heavy rod due to its own weight and elastic potential energy stored in it, Tension in rotating rod, Poisson's ratio and its limiting value, Elastic Constants, and their relations, Torque required for twisting cylinder, bending of beam, bending moment and its magnitude, determination of elastic constants for material of wire by Searle's method.

Unit-III

Gravitation and central force motion: Law of gravitation, Gravitational potential energy, Inertial and gravitational mass, Potential and field due to spherical shell and solid sphere, Motion of a particle under a central force field, Two-body problem and its reduction to one-body problem and its solution, Differential Equation of motion with central force and its solution, Concept of power Law Potentials, Kepler's Laws of Planetary motion.

Unit-IV

Special Theory of Relativity: Michelson's Morley experiment and its outcomes, Postulates of special theory of relativity, Lorentz Transformations, Simultaneity and order of events, Lorentz contraction, Time dilation, Relativistic transformation of velocity, relativistic addition of velocities, variation of mass-energy equivalence, relativistic Doppler effect, relativistic kinematics, transformation of energy and momentum, transformation of force.

Mechanics Lab

Paper Code: C24MIN101P/ C24PHY101P
30 Hrs (2 Hrs /week)
Credit: 1
Time: 3 Hrs

External Marks: 20
Internal Marks: 10
Total Marks: 30

Practical

1. Measurement of length (or diameter) using Vernier Caliper, screw gauge and travelling microscope.
2. To study the random error in observations.
3. To determine the area of window using a sextant.
4. Moment of Inertia of a Fly Wheel
5. Moment of Inertia of irregular body using a Torsion Pendulum.
6. Young's Modulus by Bending of Beam.
7. Modulus of rigidity of material of wire by Maxwell's Needle.
8. Elastic constants by Searle's method.

9. To determine the value of 'g' by using Bar pendulum.
10. To compare Moment of Inertia of a solid Sphere, Hollow Sphere, and solid Disc of same mass with the help of Torsion Pendulum.
11. To determine the bending moment of a cantilever beam with uniformly distributed load, uniformly varying load and point load.

Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination. Students are required to get minimum pass marks separately as per university rules in theory and practical components of the course.

Suggested Books:

1. Mechanics "Berkeley Physics Course Vol. I", Charles Kittel, Tata McGraw-Hill
2. Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
3. Elements of Properties of Matter, D.S. Mathur, S. Chand & Com. Pt. Ltd., New Delhi
4. Physics, Resnick, Halliday & Walker, Wiley
5. An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
6. B.Sc. Practical Physics, C.L. Arora, S. Chand Publisher, New Delhi

Course Outcomes (CO)

After completing this course, the student will be able to:

CO1. Understand the motion of rigid object along the surface, so that they can calculate moment of inertia, velocity, acceleration, total kinetic energy of an object that undergoing both translational and rotational motion and apply energy conservation in analyzing such motion.

CO2. Know about the basic concepts of elasticity, bending moment, torsional oscillations, and modulus of rigidity

CO3. Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.

CO4. Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.

CO5. Perform experiments on Properties of matter such as the determination of moduli of elasticity viz., Young's modulus, Rigidity modulus of certain materials; Sextant, Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values

Mapping of CO with PO
C24MIN101T/C24PHY101T and C24MIN101P/ C24PHY101P

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M	M	M	S	S
CO2	S	M	M	M	M	S	S
CO3	S	M	M	M	M	S	S
CO4	S	M	S	M	M	S	S
CO5	S	M	S	S	S	S	S

S= Strong, M = Medium, W= Weak

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Physics
Discipline Specific Course (DSC)
Electricity and Magnetism (Semester II)

Paper Code: C24PHY201T/C24MIN201T
45 Hrs (3 Hrs /week)
Credits: 3
Time: 2.5 Hrs

External Marks: 50
Internal Marks: 20
Total Marks: 70

Note: The examiner is required to set nine questions in all. The first question will be compulsory consisting of five short questions covering the entire syllabus consisting of 2 marks each. In addition to this, eight more questions (each question may be of 2-3 parts) will be set consisting of two questions from each unit. The student/candidate is required to attempt five questions in all selecting one from each unit in addition to the compulsory Question No.1. All questions carry equal marks. 20% numerical problems are to be set. Use of scientific calculator (nonprogrammable) is allowed.

Unit-I

Vector Background and Electric Field: Gradient of a scalar and its physical significance, Line, Surface and Volume integrals of a vector and their physical significance, Flux of a vector field, Divergence and curl of a vector and their physical significance, Gauss's divergence theorem, Stoke's theorem. Conservative nature of Electrostatic Field, Electrostatic Potential, Potential as line integral of field, potential difference Derivation of electric field E from potential as gradient. Derivation of Laplace and Poisson equations. Electric flux, Gauss's Law, Differential form of Gauss's law and applications of Gauss's law.

Unit-II

Magnetic Field: Biot-Savart law and its applications: straight wire and circular loop, Current Loop as a Magnetic Dipole and its Dipole Moment, Ampere's Circuital Law, and its applications to (1) Solenoid and (2) Toroid,

Magnetic Properties of Matter: Force on a dipole in an external field, Electric currents in Atoms, Electron spin and Magnetic moment, types of magnetic materials, Magnetization vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability, Relation between B, H and M, Electronic theory of dia and paramagnetism, Domain theory of ferromagnetism (Langevin's theory), B-H curve and hysteresis loop, importance of Hysteresis loop.

Unit-III

Time varying electromagnetic fields: Electromagnetic induction, Faraday's laws of induction and Lenz's Law, Self-inductance, Mutual inductance, Energy stored in a Magnetic field, Derivation of Maxwell's equations, Displacement current, Maxwell's equations in differential and integral form and their physical significance.

Electromagnetic Waves: Electromagnetic waves, Transverse nature of electromagnetic wave, energy transported by electromagnetic waves, Poynting vector, Poynting's theorem. Propagation of Plane electromagnetic waves in free space & Dielectrics.

Unit-IV

DC current Circuits: Electric current and current density, Electrical conductivity, and Ohm's law, Kirchhoff's laws for D.C. networks, Network theorems: Thevenin's theorem, Norton theorem, Superposition theorem.

Alternating Current Circuits: A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL, RC and LC Circuits, Series LCR Circuit: (1) Resonance, (2) Power Dissipation (3) Quality Factor and (4) Band Width, Parallel LCR Circuit.

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Electricity and Magnetism Lab

Paper Code: C24PHY201P/C24MIN201P
30 Hrs (2 Hrs /week)
Credit: 1
Time: 3 Hrs

External Marks: 20
Internal Marks: 10
Total Marks: 30

Practical

1. Use of Multimeter for measuring Resistance, A.C. and D.C. Voltage and Current, checking of electrical fuses.
2. Determination of Impedance of an A.C. circuit and its verification.
3. Frequency of A.C. mains using an electromagnet.
4. Frequency of A.C. mains Electrical vibrator.
5. High resistance by substitution method.
6. To study the Characteristics of a Series RC Circuit.
7. To study a series LCR circuit and determine its (a) Resonant frequency, (b) Quality factor.
8. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor.
9. To verify the Thevenin and Norton theorems.
10. To verify the Superposition and Maximum Power Transfer Theorems.

Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination. Students are required to get minimum pass marks separately as per university rules in theory and practical components of the course.

Suggested Books:

1. Electricity and Magnetism (Berkley, Phys. Course 2), Edward M. Purcell, 1986 McGraw-Hill Education
2. Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
3. Feynman Lectures Vol.2, R.P. Feynman, R.B. Leighton, M. Sands, 2008, Pearson Education
4. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.
5. Field and Wave Electromagnetics (2nd Edn.), David K. Cheng, Addison-Wesley Publishing Company.
6. B.Sc. Practical Physics, C.L. Arora, S. Chand Publisher, New Delhi.
7. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, Asia Publishing House.

Course Outcomes (CO)

After completing this course, the students will be able to:

CO1. Understand the Gauss law and its application to obtain electric field in different cases.
CO2. Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.
CO3. Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.
CO4. Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.
CO5. Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q- factor, Power factor and the comparative study of series and parallel resonant circuits.
CO6. Learn to present observations, results analysis and different concepts related to experiments of Electricity and Magnetism

Mapping of CO with PO

C24PHY201T/C24MIN201T and C24PHY201P/C24MIN201P

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	S	M	M	M	S	M
CO2	M	S	M	M	M	S	M
CO3	M	S	M	M	M	S	M
CO4	M	S	S	M	M	S	M
CO5	M	S	S	S	M	S	S
CO6	M	S	S	S	M	S	S

S= Strong, M = Medium, W= Weak

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Physics
Minor Course (MIN)
Electricity and Magnetism (Semester II)

Paper Code: C24MIN201T/C24PHY201T
45 Hrs (3 Hrs /week)
Credits: 3
Time: 2.5 Hrs

External Marks: 50
Internal Marks: 20
Total Marks: 70

Note: The examiner is required to set nine questions in all. The first question will be compulsory consisting of five short questions covering the entire syllabus consisting of 2 marks each. In addition to this, eight more questions (each question may be of 2-3 parts) will be set consisting of two questions from each unit. The student/candidate is required to attempt five questions in all selecting one from each unit in addition to the compulsory Question No.1. All questions carry equal marks. 20% numerical problems are to be set. Use of scientific calculator (nonprogrammable) is allowed.

Unit-I

Vector Background and Electric Field: Gradient of a scalar and its physical significance, Line, Surface and Volume integrals of a vector and their physical significance, Flux of a vector field, Divergence and curl of a vector and their physical significance, Gauss's divergence theorem, Stoke's theorem. Conservative nature of Electrostatic Field, Electrostatic Potential, Potential as line integral of field, potential difference Derivation of electric field E from potential as gradient. Derivation of Laplace and Poisson equations. Electric flux, Gauss's Law, Differential form of Gauss's law and applications of Gauss's law.

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Magnetic Field: Biot-Savart law and its applications: straight wire and circular loop, Current Loop as a Magnetic Dipole and its Dipole Moment, Ampere's Circuital Law, and its applications to (1) Solenoid and (2) Toroid,

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Alternating Current Circuits: A resonance circuit, Phasor, Complex Reactance and Impedance, Analysis for RL, RC and LC Circuits, Series LCR Circuit: (1) Resonance, (2) Power Dissipation (3) Quality Factor and (4) Band Width, Parallel LCR Circuit.

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Electricity and Magnetism Lab

Paper Code: C24MIN201P/C24PHY201P
30 Hrs (2 Hrs /week)
Credit: 1
Time: 3 Hrs

External Marks: 20
Internal Marks: 10
Total Marks: 30

Practical

1. Use of Multimeter for measuring Resistance, A.C. and D.C. Voltage and Current, checking of electrical fuses.
2. Determination of Impedance of an A.C. circuit and its verification.
3. Frequency of A.C. mains using an electromagnet.
4. Frequency of A.C. mains Electrical vibrator.
5. High resistance by substitution method.
6. To study the Characteristics of a Series RC Circuit.
7. To study a series LCR circuit and determine its (a) Resonant frequency, (b) Quality factor.
8. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor.
9. To verify the Thevenin and Norton theorems.
10. To verify the Superposition and Maximum Power Transfer Theorems.

Note: Student will perform at least six experiments. The examiner will allot one practical at the time of end term examination. Students are required to get minimum pass marks separately as per university rules in theory and practical components of the course.

Suggested Books:

1. Electricity and Magnetism (Berkley, Phys. Course 2), Edward M. Purcell, 1986 McGraw-Hill Education
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3. Feynman Lectures Vol.2, R.P. Feynman, R.B. Leighton, M. Sands, 2008, Pearson Education
4. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.
5. Field and Wave Electromagnetics (2nd Edn.), David K. Cheng, Addison-Wesley Publishing Company.
6. B.Sc. Practical Physics, C.L. Arora, S. Chand Publisher, New Delhi.
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CO3. Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.
CO4. Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.
CO5. Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q- factor, Power factor and the comparative study of series and parallel resonant circuits.
CO6. Learn to present observations, results analysis and different concepts related to experiments of Electricity and Magnetism

Mapping of CO with PO

C24MIN201T/C24PHY201T and C24MIN201P/C24PHY201P

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M	S	M	M	M	S	M
CO2	M	S	M	M	M	S	M
CO3	M	S	M	M	M	S	M
CO4	M	S	S	M	M	S	M
CO5	M	S	S	S	M	S	S
CO6	M	S	S	S	M	S	S

S= Strong, M = Medium, W= Weak

Chairperson
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