DEPARTMENT OF PHYSICS

COURSE CURRICULUM & MARKING SCHEME

B.Sc. I, II, III, IV Semester PHYSICS

(Based on Choice Based Credit System)

SESSION: 2025-26



ESTD: 1958

GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG, 491001 (C.G.)

(Former Name – Govt. Arts & Science College, Durg)

NAAC Accredited Grade A⁺, College with CPE - Phase III (UGC), STAR COLLEGE (DBT)

Phone: 0788-2212030

Website - www.govtsciencecollegedurg.ac.in, Email - autonomousdurg2013@gmail.com

FOUR YEAR UNDERGRADUATE PROGRAM (NEP- 2020) PROGRAM: BACHELOR IN SCIENCE (2024 – 28) DISCIPLINE – PHYSICS

SESSION - 2024 - 25

DS	C- 01 to 08	E	SE- 01 to 12	DGE- 01 to 02	
Code	Course Title	Code	Course Title	Code	Course Title
PHSC- 01 T	Mechanics	D7707 04	Introduction to Statistical	PHGE- 01 T	Mechanics
PHSC- 01P	Lab Course	PHSE- 01	Mechanics	PHGE- 01 P	Lab Course
PHSC- 02 T	Electricity & Magnetism	PHSE- 02	Mathematical Physics-I	PHGE- 02 T	Electricity & Magnetism
HSC- 02 P	Lab Course			PHGE- 02 P	Lab Course
PHSC- 03 T	Heat & Thermodynamics	PHSE- 03	Nuclear Physics		
PHSC- 03 P	Lab Course				
PHSC- 04 T	Waves & Optics	PHSE- 04 T	Numerical Methods &C Programming	VAC	
PHSC-04P	Lab Course	PHSE- 04 P	Lab Course		
PHSC- 05 T	Introduction to Quantum Mechanics	PHSE- 05	Mathematical Physics-II	PHVAC- 01	Renewable Energy and
PHSC- 05 P	Lab Course	FHSE- 03	Wiathematical I hysics-II	THYAC- OI	Energy Harvesting
"HSC- 06 T	Solid State Physics &SolidStateDevices	PHSE- 06	Classical Electrodynamics		
PHSC- 06 P	Lab Course	PHSL- 00	& Electromagnetic theory		SEC
		PHSE- 07 T	Digital Electronics		
PHSC-07	Classical Mechanics	PHSE- 07 P	Lab Course		
PHSC- 08	Quantum Mechanics	PHSE- 08 T	Operational Amplifier& Its Applications	PHSEC- 01	BasicElectrical Skill
	Q = M =	PHSE- 08 P	Lab Course		
Ja:		PHSE- 09 T	Solid State Physics		
0		PHSE- 09 P	Lab Course		
		PHSE- 10	Atomic and Molecular Physics		
		PHSE- 11	Statistical Mechanics		
		PHSE- 12 T	Microprocessor		
		PHSE- 12 P	Lab Course	1.5	

Signature of Convener & Members (CBoS):

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Program Outcomes (PO):

The learning outcomes of the undergraduate degree course in physics are as follows:

- In-depth disciplinary knowledge: The student will acquire comprehensive knowledge and understanding of the fundamental concepts, theoretical principles and processes in the main and allied branches of physics.
- Hands-on/ Laboratory Skills: Comprehensive hands-on/ laboratory exercises will impart analytical, computational and instrumentation skills. The students will be able to demonstrate mature skills for the collation, evaluation, analysis and presentation of information, ideas, concepts as well as quantitative and/or qualitative data.
- Role of Physics: The students will develop awareness and appreciation for the significant role played by physics in current societal and global issues. They will be able to address and contribute to such issues through the skills and knowledge acquired during the programme
- Communication and Skills: Various DSCs, DSEs, SECs, and GEs have been designed to enhance student's ability to write methodical, logical and precise reports. The courses will, in addition, guide the student to communicate effectively through presentations, writing laboratory/ project reports and dissertations.
- Critical and Lateral Thinking: The programme will develop the ability to apply the underlying concepts and principles of physics and allied fields beyond the classrooms to real life applications, innovation and creativity.
- Research skills: The course provides an opportunity to students to hone their research and innovation skills through assignment/internship/dissertation. It will enable the students to demonstrate mature skills in literature survey, information management skills, data analysis and research ethics.

Signature of Convener & Members (CBoS):

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FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

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(Ce	Program: Bachelor i ertificate/ Diploma/ De		Semes		Session: 2024	-25
1	Course Code			HSC-01T		
2	Course Title		N	Aechanics		
3	Course Type		Disciplin	e Specific C	ourse	
4	Pre-requisite (if any)			per Program		
5	Course Learning Outcomes (CLO)	➤ Explain and den energy include collision and e Evaluate and co and analyze h ➤ Analyze flow of Explain Describe specio	oly the laws of monstrate the poling their appenergy transfoutculate mome ow these propoliuids. It relativistic	motion to var principle of co plication in r rmation. nt of inertia f erties affect th	old be able to: ious dynamical situationservation of moment real-world scenario s for objects of different the motion of rotating b	um an ruch d shape odies.
		energy of a m	oving object.		1 201 4	
6	Credit Value				ning &Observation	
7	Total Marks	Maximum Marks	s: 100	Minimum	Pass Marks: 40	
PAR'	Γ – B: CONTENT OF TH	E COURSE				
-	TotalNo.of Teaching	-learning Periods (C	1 Hr. per pe	riod) - 45 Pei	riods (45 Hours)	
Jnit	-	Topics (Cour				No. Peri
I	Historical Background: Contribution of Aryabhatta and Varahmihir to science and society, Brief biography of Vikram Sarabhai with his contribution. Vectors: Scalar and vector quantities &fields, Scalar & Vector products of two vectors, Derivatives of a vector, Gradient of scalar field and its physical significance. Laws of Motion: Review of Newton's Laws of motion, Dynamics of a system of particles, Concept of Center of Mass, Motion of center of mass, Conservation of linear momentum, Motion of Rocket. Work and Energy: Work-Energy theorem for conservative forces,					12
	system of particles, Concept	of Motion: Review of Center of Mass, Net. Work and Energy	of Newton's Motion of cen y: Work-Energ	Laws of mo ter of mass, C gy theorem for	tion, Dynamics of a conservation of linear conservative forces,	
Ш	system of particles, Concept momentum, Motion of Rock Force as a gradient of Potent Rotational Dynamics: Angu of Inertia, Theorem of parall Inertia of discrete and co sphere). Elasticity: Stress & between various elastic mod Dynamics: Flow of fluids, (of Motion: Review of Center of Mass, Note: Work and Energy ial Energy, Conservatural momentum, Torquel and perpendicular continuous objects (R. Strain, Hooke's law odulii (without derivation of viscosity).	of Newton's Motion of central with Work-Energy ion of energy, ue, Conservation axes(statement ectangular late, Elastic constition), Work ty, Derivation of the Motion of t	Laws of moter of mass, Cay theorem for Elastic and in on of angular ts only), Calcimina, disc, stants, Poisson done in twist of Poiseulli's	conservation of linear conservation of linear conservative forces, elastic Collisions momentum, Moment ulation of Moment of solid cylinder, solid s's Ratio, Relationship ding a cylinder. Fluid formula, Motion of a	12
	system of particles, Concept momentum, Motion of Rock Force as a gradient of Potent Rotational Dynamics: Angu of Inertia, Theorem of parall Inertia of discrete and co sphere). Elasticity: Stress & between various elastic mo	of Motion: Review of Center of Mass, Net. Work and Energy ial Energy, Conservatural momentum, Torquel and perpendicular continuous objects (R. Strain, Hooke's law dulii (without derivations of Gravitation, Motion is conserved, areal bit and applications, Gravitation, Differential mergy and their times	of Newton's Motion of central with Work-Energy ion of energy, ue, Conservation axes (statement ectangular late, Elastic constition), Work by, Derivation of a particle velocity is constituted in the constitution of a particle velocity is constituted in the constitution of a particle velocity is constituted in the constitution of a particle velocity is constituted in the constitution of a particle velocity is constituted in the constitution of a particle velocity is constituted in the constitution of a particle velocity is constituted in the constitution of the	Laws of moter of mass, Control of the control of th	conservation of linear conservation of linear conservative forces, elastic Collisions momentum, Moment ulation of Moment of solid cylinder, solid s's Ratio, Relationship ing a cylinder. Fluid formula, Motion of a velocity. Force field (motion is er's Laws (statements solutions, Kinetic and	1
III	system of particles, Concept momentum, Motion of Rock Force as a gradient of Potent Rotational Dynamics: Angular of Inertia, Theorem of parall Inertia of discrete and complete sphere). Elasticity: Stress & between various elastic momentum of Dynamics: Flow of fluids, Complete spherical body falling in a violation: Newton's Law in a plane, angular momentum only), Satellite in circular or Oscillations: Simple harmon	of Motion: Review of Center of Mass, Note: Work and Energy ial Energy, Conservatural momentum, Torquel and perpendicular continuous objects (R. Strain, Hooke's law odulii (without derivations of Gravitation, Motion is conserved, areal bit and applications, Gric motion, Differential	of Newton's Motion of central with Work-Energy ion of energy, ue, Conservation axes(statement ectangular late, Elastic constition), Work ty, Derivation of a particle velocity is considered and equation of a equation of equation of equation of equation of equation of equation of equation equation of equation	Laws of moter of mass, Cay theorem for Elastic and in on of angular ts only), Calcumina, disc, stants, Poisson done in twist of Poiseulli's for terminal ye in a central onstant), Keple is orbits. SHM and its stants of the control of the central onstant of the central onstan	conservation of conservative relastic Collisis momentum, Nulation of Monsolid cylinder's Ratio, Relating a cylinder formula, Motivelocity. Force field (mer's Laws (states olutions, Kines ol	f linear forces, ions Moment ment of r, solid cionship or. Fluid on of a otion is tements

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FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) **DEPARTMENT OF PHYSICS COURSE CURRICULUM**

((Program:Bachelor Certificate/ Diploma/ I		Semo	ester: I	Session: 2	024-25
1		Course Code				
2	Course Title			HSC-01P		
3				Techanics		
		Course Type Discipline Specific Course				
5	Pre-requisite (if any) Course Learning			er Program		
	Outcomes (CLO)	experiments. > Record/ obs objectives. > Analyze record > Interpret res	ing mechant I be able to puired parts/ erve data rded data and ults and c	ism and law devices and as required d formulate in theck for a	s of classical marrange them to by the exp t to get desired a	perform erimenta results. proposed
		objectives rela	ated to laws	of mechanic	s and its applica	
6	Credit Value	01 Credit 1 Cre	edit = 30 Ho	ursLaborat	ory Work	
7	Total Marks	Maximum Marks	s: 50	Minimum	Pass Marks: 20	
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Sr.	TotalNo.of learn Objects (At	F OF THE COUNING-Training/performance the following the fo	ormance Pe	riods-30 Perio	ods (30 Hours)	No. of
Sr. No	TotalNo.of learn Objects (At	ning-Training/performers least 10 of the fol	ormance Pe lowing or re	elated Expe	ods (30 Hours) riments)	
Sr.	TotalNo.of learn Objects (At Measurements of learn	ning-Training/performance least 10 of the following the fo	ormance Pe lowing or re	elated Expe	ods (30 Hours) riments)	No. of Period
Sr. No	TotalNo.of learn Objects (At Measurements of le travelling microsco	ning-Training/performance least 10 of the following the congression of the following the congression of the	ormance Per lowing or ro using vernice	elated Expe	ods (30 Hours) riments)	No. of
Sr. No 1	Objects (At Measurements of le travelling microsco To study the randon	ning-Training/performance least 10 of the following the congression of the following the congression of the	lowing or reusing vernications.	elated Experer caliper, scr	ods (30 Hours) riments) rew gauge and	No. of Period
Sr. No 1 2 3	Measurements of letravelling microsco To study the randor To study the motion	ength (or diameter) pe. m error in observation of the spring and	lowing or reusing vernicons.	er caliper, scr	ods (30 Hours) riments) rew gauge and	No. of Period
Sr. No 1	Measurements of lettravelling microsco To study the randor To study the motion To determine the M To determine g and	ength (or diameter) pe. m error in observation of the spring and doment of Inertia of	lowing or reusing vernications. calculate (a)	er caliper, scr Spring cons	riments) rew gauge and tant and, (b) g.	No. of Period
Sr. No 1 2 3 4	Measurements of letravelling microsco To study the randor To study the motion To determine the M To determine g and Technique. To determine Coeff (Poiseuille's metho	ength (or diameter) pe. m error in observation of the spring and doment of Inertia of velocity for a freel ficient of Viscosity d).	using vernice ons. calculate (a) a Flywheel y falling boo	er caliper, screen Spring consider using Dig	riments) rew gauge and tant and, (b) g. ital Timing	No. of Period
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Sr. No 1 2 3 4 5 6 7 8 9 10 11	Measurements of letravelling microsco To study the randor To study the motion To determine the M To determine Coeff (Poiseuille's metho To determine the M To determine the value of the M To determine the M	ength (or diameter) pe. In error in observation of the spring and doment of Inertia of velocity for a freel dicient of Viscosity d). In oung's Modulus of dodulus of Rigidity astic constants of a falue of g using Barulue of g using Kate a beam/ cantilever ent of Inertia of an	using vernice ons. calculate (a) a Flywheel y falling boo of water by a Wire by of a Wire by wire by Sea Pendulum. er's Pendulum	er caliper, screen Spring considured Experimental Capillary Floor Maxwell's rle's method m.	riments) rew gauge and tant and, (b) g. ital Timing ow Method Method. needle.	No. of Period

Text Books, Reference Books Recommended and Others

Text Books Recommended-

- 1. Mechanics & Properties of matter, D.C. Tayal & P. Tayal, 2023, Pub. By Authors.
- 2. Unified Physics I -R.P.Goyal, Shivlal Agrawal Publication
- 3. Unified Physics I, Navbodh Publication

Reference Books Recommended-

- 1. Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
- 2. Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
- 3. Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.

Online Resources (e-books/ learning portals/ other e-resources)

- 1. All e-books of physics https://www.e-booksdirectory.com/listing.php?category=2
- 2. Free physics text book in PDF
- 3. https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Km $a0VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE$
- Cambridge University Books for Physics https://www.cambridgeindia.org/
- 5. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- NPTEL Online courses https://nptel.ac.in/courses/115105098; https://archive.nptel.ac.in/courses/115/106/115106123/;
- 7. BSc Lectures by Prof. H C Verma: https://bsc.hcverma.in/index.php/course/relativity; https://bsc.hcverma.in/index.php/course/cm1

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA):30 Marks

End Semester Examination (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By course teacher)

Internal Test/ Quiz (2): 20#20 Assignment/Seminar (1):10

Total Marks: 30

Better marks out of the two Test / Quiz

+ marks obtained in Assignment shall be considered against 30 Marks

End Semester

Two section - A & B

Exam (ESE):

Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type, 1 out of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS

PART - C: Learning Resources

Text Books, Reference Books and others

Text Books Recommended-

- 1. Advanced Practical Physics for students, B.L.Flint&H.T.Worsnop, 1971, Asia Publishing House.
- 2. Engineering Practical Physics, S.Panigrahi& B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- 3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- 4. Practical Physics B.Sc. I: R P Goyal, Shivlal Publications

Reference Books Recommended-

- 1. Advanced Practical Physics for Students by B.L. Worsnop and H.T. Flint
- 2. Practical Physics by G.L. Squires
- 3. An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements by John R. Taylor
- 4. Mechanics and Properties of Matter by J.C. Upadhyaya

Online Resources (e-books/ learning portals/ other e-resources)

1. Link for e-Books for Physics: Physics Practical:

https://www.uou.ac.in/sites//default/files/slm/BSCPH-104.pdf

- 2. Virtual Lab: https://vlab.amrita.edu/?sub=1&brch=74
- 3. https://vlab.amrita.edu/?sub=1&brch=74&sim=571&cnt=1
- 4. https://www.ae.msstate.edu/vlsm/

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:

Continuous

50 Marks

Internal Test / Quiz - (2):

10 &

Continuous Internal Assessment(CIA):15 Marks

EndSemester Exam(ESE):35 Marks

InternalAssessment(Cl	A):	10			+Marks obtained in
(By Course Teacher)		Assignment/Seminar +Atte	ndance -05	Assignment shall be consider	
		Total Marks -	15	against 15	Marks
End Semester		boratory Performance: On	-	ent	Managed by Course
	Pei	rformed the Task based on	lab. work	-20	teacher as per lab.
Exam (ESE):		ırks			status
	Spe	otting based on tools & tech	nology (writter	n) – 10	
	1 -1	arks			
	Viv	/a-voce (based on principle/	technology)	- 05	
	Ma	ırks			

Name and Signature of Convener & Members of CBoS:

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Better marks out of the two

FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF PHYSICS

(_	ram: Bachelor i ate/ Diploma/ De		Semester: II	Session: 2024	-25
1	Course	e Code		PHSC-02	T	
2	Course	e Title		ELECTRICITY AND M	MAGNETISM	
3	Course	е Туре		Discipline Specif	ic Course	
4	Pre-re	quisite (if any)		As per Prog		
5	Course Learning Outcomes (CLO) After going through the course, the student should be able to: State various laws related with electrostatics, dielectric, current, magnetism and electromagnetic induction. Apply vector (electric fields, Coulomb's law) and scalar potential, electric potential energy) formalisms of electrostatic Compare rise and decay of current in LR, CR, LCR circuits. Apply Biot-Savart law for calculation of magnetic field i geographic situations. Derive and analyze Maxwell's equations.		electrostatics, dielectric, etic induction. omb's law) and scalar ormalisms of electrostatics. LR, CR, LCR circuits. ion of magnetic field in	(electric		
6	Credit	Value			earning &Observation	1
7	Total		Maximum Marks		um Pass Marks: 40	
Un		talNo.of Teachin		(01 Hr. per period) - 4 urse contents)	45 Periods (45 Hours)	No. o
UII.			•			Period
Ι	in Vo of ap	Chhattisgarh. ector Analysis: D Vector fields, Coplication in electrectric flux, Gauss'	ivergence & Curl of V Gauss-divergence theo costatics and magneto s theorem of electros	Vector fields, Line, surfacement and Stoke's theostatics. Electrostatics fattics, Applications of	droelectric power plants ace and volume integrals orem of vectors and its field: Electrostatic Field, Gauss theorem- Electric charged conductor.	12
field due to point che Electrostatic poten a point charge, Calc capacitor, Energy po Dielectric & Electr Gauss's theorem		eld due to point chi	arge, infinite line of ci	INTER DIVING CHAIRCH SIL	out, onai gou conductor.	
П	a ca D G	lectrostatic poten point charge, Calc pacitor, Energy point lectric & Electra auss's theorem electric.Steady cur	culation of electric fiest unit volume in electric Currents: Dielectrin dielectrics, Paral rrent, current density.	as line integral of elected from potential, Caparostatic field. ric medium, Polarisation plate capacitor of the p	ric field, potential due to acitance of Parallel plate on, Displacement vector, completely filled with and Continuity equation,	13
Ш	a ca D G di R M ci ve M	point charge, Calcapacitor, Energy point charge, Calcapacitor, Energy point electric & Electra auss's theorem electric. Steady curise and decay of cular coil, soleno ector potential, Amagnetic properties	culation of electric fier unit volume in electric Currents: Dielectrin dielectrics, Paralirrent, current density. Turrent in LR, CR, LCR etostatics: Biot-Savart id carrying current, Diepere's circuital law, sof materials: Magneter and control of the control of	as line integral of elected from potential, Caparostatic field. ric medium, Polarisatic lel plate capacitor I, non – steady current circuits. Is law and its applicate bivergence and curl of the capacitor I, magnetic intensity, magnetic	ric field, potential due to acitance of Parallel plate on, Displacement vector, completely filled with and Continuity equation, ions- straight conductor, magnetic field, Magnetic induction, permeability,	10
	a ca ca D G di R M ci ve M m T E se fi M	lectrostatic poten point charge, Calcapacitor, Energy point charge, Calcapacitor, Energy point auss's theorem electric. Steady curise and decay of cular coil, soleno ector potential, Amagnetic properties agnetic susceptibil lectromagnetic Inclif and mutual indeeld. In axwell's equation of current Displace.	culation of electric fier unit volume in electric Currents: Dielectric Currents: Dielectric Current, Dielectric Current density arrent, current density arrent in LR, CR, LCR etostatics: Biot-Savart description of carrying current, Diepere's circuital law, of materials: Magnetity, Brief introduction duction: Faraday's functance, L of single current and Electromagnetic current. Maxwell	as line integral of elected from potential, Caparostatic field. ric medium, Polarisatic liel plate capacitor I, non – steady current circuits. Is law and its applicate bivergence and curl of the color of dia, para and ferrolaws of electromagnetic coil, M of two coils, Entite wave propagation I's equations, Wave equations, Wave equations.	ric field, potential due to acitance of Parallel plate on, Displacement vector, completely filled with and Continuity equation, ions- straight conductor, magnetic field, Magnetic induction, permeability, magnetic materials. c induction, Lenz's law, nergy stored in magnetic in Equation of continuity	10

Text Books, Reference Books and Others

Text Books

- 1. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- 2. Unified Physics Part II, R. P. Goyal, Shivlal Agrawal and Sons
- 3. Unified Physics Navbodh Publications
- 4. Introduction to Electrodynamics and Electromagnetism, H.C.Verma,

Reference Books

- 1. Vector analysis Schaum's Outline, M.R. Spiegel, S. Lipschutz, D. Spellman, 2nd Edn., 2009, McGraw- Hill Education.
- 2. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

Online Resources (e-books/learning portals/other e-resources)

- 1. All e-books of physics https://www.e-booksdirectory.com/listing.php?category=2
- 2. Free physics text book in PDF

 https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Kma0

 VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE
- 3. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 4. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- 5. NPTEL Online courses: https://onlinecourses.nptel.ac.in/noc21_ph05/preview
- 6. https://archive.nptel.ac.in/courses/115/104/115104088/
- 7. Classical Electromagnetism 1 (Electrostatics) https://bsc.hcverma.in/course/cee1
- 8. Classical Electromagnetism 2 (Electrostatics) https://bsc.hcverma.in/course/cee2

PART – D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA):30 Marks

End Semester Examination (ESE): 70 Marks

End Semester Examin	lation (ESE): 70 Marks				
Continuous Internal	Internal Test/ Quiz (2):	Better marks out of the two Test / Quiz			
Assessment (CIA):	20+20Assignment/ Seminar (1): 10	+ marks obtained in Assignment shall			
(By course teacher)	Total Marks: 30	be considered against 30 Marks			
End Semester	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Mark				
Examination (ESE):					
	Section B: Descriptive answer type,100	t of 2 from each unit-4x10=40 Marks			

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

	Program:Bachelor	in Science	Semester: II	Session: 2024-	-25
(C	Certificate/ Diploma/ D	egree/ Honors)			
1	Course Code		PHSC- 02	P	
2	Course Title		Electricity & Ma	ignetism	
3	Course Type Discipline Specific Course				
4	Pre-requisite (if any)	As per program			
6	Course Learning Outcomes (CLO) After the complete working laws of able to Verify variance circuits. As experiment. Verify variance Faraday's measuring and recorded do recorded do Interpret reto laws of E		pletion of the course, Students are expected to undersing Electricity, Magnetism and EMWs. The students will also rious circuit laws, network theorems, using simple electricity and arrange them to perfects. It is a laws in electricity and magnetism such as Lenz's a law and learn about the construction, working of various truments are also as required by the experimental objectives. Analysis and formulate it to get desired results. It is and check for attainment of proposed objectives related to the constructions.		
7	Credit Value Total Marks	01 Credit 1 C	Credit = 30 Hours Labor	Pass Marks: 20	
				rass Marks: 20	
PA.	RT – B: CONTENT	I OF THE CO	LIKAB.		
	TotalNo of la	orning Training/		Daviada (20 Harry)	
S.			performance Periods -30		No of
Sr.	Objects (
No.	Objects (.	At least 10 of the	performance Periods -30 following or related Ex	periments)	
	Objects (. To use a Multimeter	At least 10 of the for measuring (a)	performance Periods -30 following or related Ex Resistances, (b) AC and	periments)	Periods
No.	To use a Multimeter Current, and (d) che	At least 10 of the for measuring (a) cking electrical fu	performance Periods -30 following or related Ex Resistances, (b) AC and ses.	periments)	
No. 1 2	To use a Multimeter Current, and (d) che To compare capacita	At least 10 of the for measuring (a) cking electrical furances using De'Sa	performance Periods -30 following or related Ex Resistances, (b) AC and ses. uty's bridge.	periments) DCVoltages,(c) DC	Periods
No.	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel	At least 10 of the for measuring (a) cking electrical funces using De'Sa d strength B and in	performance Periods -30 following or related Ex Resistances, (b) AC and ses. uty's bridge. ts variation in a Solenoid	periments) DCVoltages,(c) DC	No. of Periods
No. 1 2 3	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac	At least 10 of the for measuring (a) cking electrical function be said strength B and it teristics of a Serie	performance Periods -30 following or related Ex Resistances, (b) AC and ses. uty's bridge. ts variation in a Solenoid	DCVoltages,(c) DC Determine (dB/dx).	Period
No. 1 2 3 4	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel L Quality factor Q.	At least 10 of the for measuring (a) cking electrical furances using De'Sard strength B and interistics of a Series R circuit and detection.	reformance Periods -30 following or related Ex Resistances, (b) AC and ses. uty's bridge. ts variation in a Solenoid s RC Circuit. rmine its (a) Resonant Fractermine its (a) Anti-resor	Determine (dB/dx).	Period
No. 1 2 3 4 5	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel L	At least 10 of the for measuring (a) cking electrical furances using De'Sard strength B and interistics of a Series R circuit and detection.	reformance Periods -30 following or related Ex Resistances, (b) AC and ses. uty's bridge. ts variation in a Solenoid s RC Circuit. rmine its (a) Resonant Fractermine its (a) Anti-resor	Determine (dB/dx).	Periods
No. 1 2 3 4 5	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel L Quality factor Q.	At least 10 of the for measuring (a) cking electrical furnces using De'Sard strength B and interistics of a Series CR circuit and determined the CR circuit and determined the Resistance by Carteristics of CR circuit and determined the Resistance by Carteristics of CR circuit and determined the Resistance by Carteristics of CR circuit and determined the Resistance by Carteristics of CR circuit and determined the Resistance by Carteristics of CR circuit and CR circuit	rey Foster's Bridge.	Determine (dB/dx).	Period
No. 1 2 3 4 5 5 6 7	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel I Quality factor Q. To determine a Low To verify the Thever	At least 10 of the for measuring (a) cking electrical furances using De'Sard strength B and interistics of a Serie R circuit and detection. CR circuit and detection Resistance by Carnin and Norton the	rey Foster's Bridge.	Determine (dB/dx). Tequency, (b) Quality mant frequency and(b)	Period
No. 1 2 3 4 5 5 6 7 8	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel I Quality factor Q. To determine a Low To verify the Thever To verify the Superp	At least 10 of the for measuring (a) cking electrical furnces using De'Sard strength B and interistics of a Series CR circuit and determined the CR circuit	representation in a Solenoid service (a) Resonant France (b) Action in a Solenoid service (c) Resonant France (c) Resonant Fra	Determine (dB/dx). Tequency, (b) Quality mant frequency and(b)	Periods
No. 1 2 3 4 5 6 7 8 9	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel I Quality factor Q. To determine a Low To verify the Thever To verify the Superp	At least 10 of the for measuring (a) cking electrical further ances using De'Sard strength B and interistics of a Series CR circuit and detected and Resistance by Carin and Norton the position, and Maxinagnetometer and series of the control of th	Resistances, (b) AC and ses. uty's bridge. ts variation in a Solenoid s RC Circuit. ermine its (a) Resonant Frances Frey Foster's Bridge. termine its (a) Anti-resorate Frey Foster's Bridge. termine its (b) Anti-resorate Frey Foster's Bridge. termine its (c) Anti-resorate Frey Foster's Bridge. termine its (c) Anti-resorate Frey Foster's Bridge. termine its (c) Anti-resorate Frey Foster's Bridge. termine Frey Foster's Bridge. termine Frey Foster's Bridge.	Determine (dB/dx). Tequency, (b) Quality mant frequency and(b)	Period
No. 1 2 3 4 5 6 7 8 9 10	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel I Quality factor Q. To determine a Low To verify the Thever To verify the Superp To use a vibration m	At least 10 of the for measuring (a) cking electrical furnces using De'Sard strength B and interistics of a Series CR circuit and detection and Norton the position, and Maxing agnetometer and seld due to a current control of the control of the position.	representation in a Solenoid service (a) Resonant France (b) Anti-resonant France (core). The representation is a Solenoid service (a) Resonant France (b) Anti-resonant France (core). The representation is a Solenoid service (a) Resonant France (b) Anti-resonant France (core). The representation is a Solenoid service (a) Anti-resonant France (core). The representation is a Solenoid service (a) Anti-resonant France (core). The representation is a Solenoid service (a) Anti-resonant France (core).	Determine (dB/dx). Tequency, (b) Quality mant frequency and(b)	Period
No. 1 2 3 4 5 6 7 8 9 10 11	To use a Multimeter Current, and (d) che To compare capacita Measurement of fiel To study the Charac To study a series LC Factor. To study a parallel I Quality factor Q. To determine a Low To verify the Thever To verify the Superp To use a vibration m Study of magnetic fi Study of magnetic fi	At least 10 of the for measuring (a) cking electrical further ances using De'Sard strength B and interistics of a Series CR circuit and detection and Norton the position, and Maximagnetometer and seld due to a current elds using Deflect	representation in a Solenoid service (a) Resonant France (b) Anti-resonant France (core). The representation is a Solenoid service (a) Resonant France (b) Anti-resonant France (core). The representation is a Solenoid service (a) Resonant France (b) Anti-resonant France (core). The representation is a Solenoid service (a) Anti-resonant France (core). The representation is a Solenoid service (a) Anti-resonant France (core). The representation is a Solenoid service (a) Anti-resonant France (core).	Determine (dB/dx). Determine (dB/dx). requency, (b) Quality nant frequency and(b) eorem.	Periods

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Text Books, Reference Books and Others

Text Books Recommended-

- 1. Engineering Practical Physics, S.Panigrahi&B.Mallick,2015, Cengage Learning India Pvt.
- 2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- 3. Unified Practical Physics: R P Goyal, Shivlal Agrawal & Sons
- 4. Unified Practical Physics: YugbodhPrakashan
- 5. Unified Practical Physics: NavbodhPrakashan

Reference Books Recommended-

- 1. Basic Electrical and Electronics Engineering by S. K. Bhattacharya
- 2. A Textbook of Electrical Technology by B.L. Theraja and A.K. Theraja (Volumes 1 and 2)
- 3. Engineering Circuit Analysis by William H. Hayt, Jack E. Kemmerly, and Steven M. Durbin
- 4. Practical Physics by G.L. Squires

Online Resources (e-books/learning portals/other e-resources)

- 1. Link for e-Books for Physics: Physics Practical: https://www.uou.ac.in/sites//default/files/slm/BSCPH-104.pdf
- Virtual Lab : https://vlab.amrita.edu/index.php?sub=1&brch=192
- 3. http://emv-au.vlabs.ac.in/#
- 4. https://www.ae.msstate.edu/vlsm/
- 5. https://nationalmaglab.org/magnet-academy/watch-play/interactive-tutorials
- https://jigyasa-csir.in/cgcri/n12-t4-a3/

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:

50 Marks

Continuous Internal Assessment(CIA):15 Marks

EndSemester Exam(ESE):35 Marks

Continuous	Internal Test / Quiz-(2): 10 & 10	Better marks out of the two	
InternalAssessment(Assignment/Seminar +Attendance -05	Test / Quiz + Marks obtained i	
CIA):	Total Marks - 15	Assignment shall be considered	
(By Course Teacher)		against 15 Marks	
End Semester	Laboratory Performance: On spot Assessment	Managed by	
	Performed the Task based on lab. work -	20 Marks Course teacher	
Exam (ESE):	Spotting based on tools & technology (written) -	-10 Marks as per lab. status	
	Viva-voce (based on principle/technology) -	05 Marks	

Name and Signature of Convener & Members of CBoS:

FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

PAI	RT – A: INTR	ODUCTION	0			37.55
	Program: Bach (Diploma/ Deg	elor in Science	Semester: I	II	Session: 2024	-25
1	Course Code		PHS	SC-03T		
2	Course Title		Heat and Thermodynamics			
3	Course Type		Discipline Specific Course			
4	Pre-requisite (i	if	As per	Program		
	any)					
5	Course Learnin	ng After going thr	ough the course, the stud	dent should b	e able to:	
	Outcomes (CL	thermody thermody				laws of
		with en thermody	ne laws of thermodynam ergy transfer, heat e ynamic processes.	ngines, refr	igeration system and	d other
			basic aspects of kinetic			
6	Credit Value	03 Credits			rning &Observation	1
7	Total Marks	Maximum M		Minimum	Pass Marks: 40	
PAI		TENT OF THE C				
	TotalNo.o	f Teaching-learning F	Periods (01 Hr. per per	riod) - 45 Pe	riods (45 Hours)	
Unit		•	ics (Course contents)			No. of Period
Ι	physics in the mechanics. Laws of The thermodynamic various Thermodynamic Reversible & in Carnot's theorem	ermodynamics: There is and temperature. First odynamical Processes, reversible processes. S	storical background of Indian culture, Contributed modynamic Description at law and internal energy Work Done during Isomecond law of thermodynamic reversible & irreversibles.	ntion of S. No. of system of system of system of system of system of the conversion of the control of the contr	n, Zeroth Law of on of heat into work, Adiabatic Processes, ropy, Carnot's cycle,	12
II	Thermodynam function. Maxv - C _V), C _P /C _V , 7	nic Potentials: Interna vell's relations & applic rdS equations, Thermoo	l Energy, Enthalpy, He cations, Clausius- Clape dynamic energy equation	yron Equation n- change in	n, Expression for (C _P internal energy of an	11
Ш	ideal and Vander Waal's gas, Joule-Thompson Effect, Cooling by adiabatic demagnetization. Kinetic Theory of Gases: Maxwellian distribution of speeds in an ideal gas: distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values, Molecular Collision and Mean Free Path. Transport Phenomena in gases: Viscosity, Conduction and Diffusion, Law of equipartition of energy.					
IV Keyr	Stefan Boltzm displacement la of Wien's dis verification of la vords: Zero	ann Law, Newton's law and Rayleigh-Jeans latribution law and Raplanck's radiation law.	liation, Spectral distribution of cooling from Staw (Only qualitative). It is a specific to the second of the modynamics, Second of the second	Stefan Boltzi Planck's radia om Planck's econd Law	mann's law. Wien's ation Law, Deduction s law. Experimental of Thermodynamics,	Entropy,
			s, Maxwell's Thermody Molecular Collisions, Re			Jases,

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Signature of Convener & Members (CBoS):

PART - C: LEARNING RESOURCES

Text Books, Reference Books and Others

Text Books

- 1. Heat and Thermodynamics: Singhal, Agrawal and Satya Prakash, Pragati Prakashan 1984
- 2. Physics (Part-2): Editor, Prof. B.P.Chandra, M.P. Hindi Granth Academy
- 3. Unified Physics -II ,R.P.Goyal, Shivlal Agrawal &Sons
- 4. Unified Physics -II. NovbodhPrakashan

Reference Books

- 1. Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears&G.L.Salinger. 1988, Narosa
- 2. Energy Science in Vedas: A Treatise on Vedic Thermodynamics and Free Energy (Exploring Lost Science and Technology in Vedas), Ramesh Kumar Mineria; Priya Veda Publications

Online Resources (e-books/ learning portals/ other e-resources)

- Basics of thermodynamics https://www.youtube.com/watch?v=9GMBpZZtjXM&list=PLD8E646BAB3366BC8
- 2. Thermodynamics https://www.youtube.com/watch?v=E9cOAMhFUz0
- 3. Second law of thermodynamics https://www.youtube.com/watch?v=F flGosPY80
- 4. NPTEL Online Lectures: https://archive.nptel.ac.in/courses/115/105/115105129/
- 5. https://archive.nptel.ac.in/courses/115/106/115106090/
- 6. https://bsc.hcverma.in/course/penopcyc
- 7. Vedic Science and Thermodynamics: https://www.puranavedas.com/vedic-physics/
- 8. https://www.amazon.in/Vedic-Physics-Raja-Ram-
 Mohan/dp/0968412009?asin=1988207045&revisionId=&format=4&depth=2
- 9. https://ia903100.us.archive.org/3/items/wholelottabooks/The%20Astronomical%20Code%2066%20the%20Rgveda%20-%20Shubash%20Kak.pdf

PART - D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA): 30 Marks

End Semester Examination (ESE): 70 Marks

Continuous Internal	Internal Test/ Quiz (2): 20 20	Better marks out of the two Test
Assessment (CIA):	Assignment/ Seminar (1): 10	Quiz+ marks obtained i
(By course teacher)	Total Marks: 30	Assignment shall be considere
		against 30 Marks
	T 42 A C D	

End Semester

Two section - A & B

Exam (ESE):

Section A: Q1. Objective -10 x1 = 10 Mark; Q2. Short answer type- 5x4 = 20Marks Section B: Descriptive answer type, 10ut of 2 from each unit-4x10 = 40 Marks

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

	Program:Bachelor (Diploma/ Degree/		Semeste		Session: 2024-	25
1	Course Code			PHSC- 03	3P	
2	Course Title		Heat	and Thermo	odynamics	
3	Course Type		Disc	cipline Core	Course	
4	Pre-requisite (if any)	ourse type			gram	
5	Course Learning	> Lab Proficiency: Thermometers, pressure gauges, calori				rimeters,
J	Outcomes (CLO)	heat Hand trans Data analy Pred	transfer appara ls-on Learning' itions, experim Analysis: Ex vsis. ictive Skills: Tl	tus, experim **: Heat tran ents. perimental	ental setup, data acquistisfer, work done, entrodata, theoretical discrict behavior, varying contic behavior, varying contic behavior, varying contic behavior.	sition. py, phase epancies
		> Theo	rimentation. ory-Practice Int vork, synthesis,	tegration: T	heoretical knowledge, s.	practica
6	Credit Value	01 Credit	1 Credit = 30	HoursLabo	oratory Work	
7	Total Marks	Maximum	Marks: 50	Minimum	Pass Marks: 20	
	RT - B: CONTE	NT OF THE	COURSE			
				Periods -30	Periods (30 Hours)	
S		(At least 10 of				No. of
N	0.					Period
1	method.				naterial by Lee's disc	30
2	temperature.			junctions of	a thermocouple with	
3	3 To verify Newto	n's law of coolin	g.			
4	thermometer.				atinum resistance	
-	To determine the	coefficient of th	ermal conducti	ivity(k) of a	rubber tube.	1
(6 To study the hea	t efficiency of an	electric kettle	with varying	g voltage.	
-	7 To determine the	ratio of specific Clement and De	heat at constar sorme's metho	nt pressure a d.	nd constant volume	
8	8 To determine the	coefficient of the	ermal conducti	ivity of copp		
	To study the var	ts Two Junctions	S		th Difference of	
1	To determine M constant flow m	echanical Equiva ethod.	llent of Heat, J,			
		Planck's constar	nt using black b	ody radiatio	on.	-
1		efan's Constant.				1
1					law of cooling, Te	mperatu

Text Books, Reference Books and Others

Text Books Recommended-

- 1. Advanced Practical Physics for students, B.L.Flint&H.T.Worsnop, 1971, Asia Publishing House.
- 2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- 3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- 4. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal, 1985, Vani Publication.
- 5. Unified Practical Physics B.Sc II: R P Goyal, Shivlal Agrawal & Sons Publications

Reference Books Recommended-

- 1. Practical Physics by C.L. Arora
- 2. Practical Physics by S.L. Gupta and Vijay Kumar
- 3. Advanced Practical Physics for Students by B.L. Worsnop and H.T. Flint

Online Resources (e-books/learning portals/other e-resources)

Link for e-Books for Physics Practicaland Virtual labs

- Thermal Physics and Statistical Mechanics: Laboratory Collectionhttps://egyankosh.ac.in/handle/123456789/67450
- Virtual Lab : https://vlab.amrita.edu/index.php?sub=1&brch=194
- 3. https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=802&cnt=1
- 4. https://vlab.amrita.edu/index.php?sub=1&brch=194&sim=801&cnt=4
- 5. https://srmap.edu.in/seas/physics-virtual-lab/
- https://sites.google.com/view/vlab-bnmitmech/home/heat-transfer-lab
 https://www.pbslearningmedia.org/resource/lsps07-sci-phys-thermalenergy/thermal-energy-transfer/#.WdJiOJIrLIU

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks

EndSemester Exam(ESE):35 Marks

Continuous InternalAssessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance -05 Total Marks - 15	/ Quiz +Mar	out of the two Test ks obtained in shall be considered arks
End Semester Exam (ESE):	Laboratory Performance: On spot Assessment Performed the Task based on lab. work Spotting based on tools & technology (written Viva-voce (based on principle/technology)	- 20 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

	Γ – A: INTRODUCT] rogram: Bachelor in Scie (Diploma/ Degree/ Hono	ence	Semester: IV		Session: 2024-25		
1	Course Code		P	HSC-04	Γ		
2	Course Title	Waves and Optics					
3	Course Type		Discipline Specific Course				
4	Pre-requisite (if any)		As per Program				
5	Course Learning	After goin	og through the course, th	e student	should be able to:		
	Outcomes (CLO)	and affe Der con solv Exp pro out Des elli	predict how factors suret wave propagation. nonstrate an understand structive and destructive problems involving we plain the concept of depagation, including how after passing through na scribe the polarization policial polarization, and	ling of in interfere ave super iffraction waves b rrow oper of waves apply pol	and its implications for end around obstacles and	erature cluding edge to wave spread ar, and	
-	Credit Value	manipulate electromagnetic waves. Credit Value 03 Credits 1 Credit= 15 Hours - Learning & Observation					
7	Total Marks Maximum Marks: 100 Minimum Pass Marks: 40						
7111	T - B: CONTENT O TotalNo.of Teaching	g-learning	Periods (01 Hr. per pe	eriod) - 4	5 Periods (45 Hours)		
Unit	TotalNo.of Teaching	g–learning To _l	Periods (01 Hr. per periods (Course contents)		Perio	
	Contribution of C. V. Ra acoustics and optics. Waves in Medium: Spee in a fluid, Energy density and relationship between t Reflection, refraction an	man: Brief d of transve and energy hem. d diffraction	Periods (01 Hr. per periods (Course contents) Sbiography of C. V. Ramerse waves on uniform set transmission in waves. On of sound: Acoustic in diffraction of sound, priods	nan with hatring, Spe Group ve mpedance	is contribution in field of ed of longitudinal waves locity and phase velocity of a medium, percentage sonar system.	Perio 11	
Unit	Contribution of C. V. Ra acoustics and optics. Waves in Medium: Speed in a fluid, Energy density and relationship between the Reflection, refraction and reflection & refraction at a surflection in the surflection of the su	man: Brief d of transve and energy hem. d diffraction boundary, of superpose, periment. n Thin Fil inges); Frin th and refra	Periods (01 Hr. per periods (Course contents) biography of C. V. Ramerse waves on uniform stransmission in waves. on of sound: Acoustic indiffraction of sound, principle of the period of the perio	nan with heatring, Specific Group vermpedance neiple of a efront an se chang re-shaped (Fizeau Fination of	is contribution in field of sed of longitudinal waves locity and phase velocity of a medium, percentage a sonar system. d division of amplitude, e on reflection, Stokes' films. Fringes of equalinges). Newton's Rings, wavelength, Wavelength	Perio	
U nit	Contribution of C. V. Ra acoustics and optics. Waves in Medium: Spee in a fluid, Energy density and relationship between the Reflection, refraction and reflection & refraction at a streatment. Interference in inclination (Haidinger Frimeasurement of waveleng Michelson's Interference difference. Diffraction: Fresnel Diffestraight edge, a slit and a streatment of the str	man: Brief d of transver and energy hem. d diffraction boundary, of superpose periment. n Thin Fill inges); Frin th and refra er, Formati raction; Ha wire using l	Periods (01 Hr. per periods (Course contents) biography of C. V. Ramerse waves on uniform stransmission in waves. on of sound: Acoustic in diffraction of sound, principle of sound, pri	nan with heatring, Specification of ate. Fresne, Specification of ate. Fresne, Fraunhoving Power of the string of	is contribution in field of sed of longitudinal waves locity and phase velocity of a medium, percentage sonar system. If division of amplitude, e on reflection, Stokes' films. Fringes of equalinges). Newton's Rings, wavelength, Wavelength el Diffraction pattern of a fer diffraction; Single slit, or of Grating.	11 12 11	
Unit I	Contribution of C. V. Ra acoustics and optics. Waves in Medium: Spee in a fluid, Energy density and relationship between the Reflection, refraction and reflection & refraction at a surface surface. Principle of Young's Double Slit extreatment. Interference in inclination (Haidinger Frimeasurement of waveleng Michelson's Interferomet difference. Diffraction: Fresnel Diffestraight edge, a slit and a surface Double slit. Multiple slits Polarization: Polarized double refraction, Nicol Fand elliptical polarization.	man: Brief d of transver and energy hem. d diffraction boundary, of superpose periment. In Thin Fill inges); Frin th and refra er, Formation; Ha wire using l & Plane Di light and in Prism, Doub In Polarization	Periods (01 Hr. per periods (Course contents) biography of C. V. Ramerse waves on uniform stransmission in waves. on of sound: Acoustic in diffraction of sound, principle of sound pr	nan with heatring, Spe Group vermpedance mpedance nciple of a efront an se chang re-shaped Fizeau Fi nation of ate. Fresn s. Fraunhoving Power intation, Fi d, Phase if and Huy	is contribution in field of sed of longitudinal waves locity and phase velocity of a medium, percentage sonar system. If division of amplitude, e on reflection, Stokes' films. Fringes of equalinges). Newton's Rings, wavelength, Wavelength el Diffraction pattern of a fer diffraction; Single slit,	12	

Text Book, Reference Book and Others

Text Books Recommended-

- 1. Berkely Physics Course: Vol.-III, 'Waves and Oscillations'
- 2. Principles of Optics, B.K. Mathur, 1995, Gopal Printing
- 3. Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, S. Chand Publication
- 4. Physical Optics, A.K. Ghatak
- 5. Unified Physics- II, R. P. Goyal, Shivlal Agrawal Publications
- 6. Unified Physics- II, Navbodh Publications

Reference Books Recommended

- 1. Concepts of Physics by H.C. Verma
- 2. Fundamentals of Physics by R. Shankar
- 3. Optics by Ajoy

Online Resources (e-books/ learning portals/ other e-resources)

- Wave an introduction https://youtu.be/SuQE7eUEriU
- 2. Interference https://youtu.be/hvpYKPyT-vc
- 3. Diffraction https://youtu.be/3RZZQvEVrEA
- 4. Polarization https://youtu.be/nELYaf N528
- 5. Waves and Oscillations- https://archive.nptel.ac.in/courses/115/106/115106119/
- Optics- https://archive.nptel.ac.in/courses/115/107/115107131/

PART – D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA):30 Marks

End Semester Examination (ESE): 70 Marks

Continuous Internal Assessment (CIA): (By course teacher)	Internal Test/ Quiz (2): 20 20 Assignment/ Seminar (1): 10 Total Marks: 30	Better marks out of the two Test / Quiz + marks obtained in Assignment shall be considered against 30 Marks
End Semester Examination (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 M Section B: Descriptive answer type,1ou	Mark; Q2. Short answer type- 5x4 =20Marks t of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

	Program:E	Bachelor in	Science	Semest	er: IV	Session: 2024-25	
	(Diploma	Degree/ H	Ionors)				
	Course Code		PHSC- 04P				
2 (Course Title		Waves and Optics				
3 (Course Type	9	Discipline Specific Course				
-	Pre-requisite		As per program				
5 Course Learning Outcomes (CLO)			laws and printo wave natur Gain prosource i. demonst instrume Develop refraction	ciples behind e of light. The officiency in officiency in officiency, s rating compents, and collections, and collection, diffraction ions in various	various option option of the students will be perating lab odium and Latence in setting accurate derstanding dispersion, a scientific dispersion of the student of the student option op	of optical principles s and interference, as well isciplines	as light rimeter ibrating such as the
				recorded dat	a and formula	ate it to get desired results).
6	Credit Valu	ie	01 Credit			boratory Work	
7		Total Marks Maximum Marks: 50 Minimum Pass Marks: 20					
PA]	RT – B: C	ONTEN	T OF THE C	COURSE			
_	To	otalNo.of le	earning-Trainin	g/performan	ce Periods -3	0 Periods (30 Hours)	
Sr.		Objects	(At least 10 of	the following	or related I	Experiments)	No. o
1	To deter	mine the Fi	requency of AC	mains with the	ne help of So	nometer.	30
2	Determi	nation of a	ngle of prism us	ing spectrom	eter.	-	
3	To deter	mine the R	efractive Index	of the Materi	al of a given	Prism using	
3	0	oton					
4	To deter	mine Dispe	ersive Power of	the Material	of a given Pri	ism using Spectrometer	
5	To deter	mine the v	alue of Cauchy	Constants of	a material of	a prism.	
6	To deter	rmine the R	esolving Power	of a Prism.			
7	To deter	rmine wave	length of sodiu	m light using	Fresnel Bipri	ism.	
8	To dete	rmine wave	elength of sodiu	m light using	Newton's Ri	ngs Method.	
9	To dete	rmine the v	vavelength of La	aser light usin	g Single Slit	Diffraction.	
10	To dete	rmine wave	elength of Sodiu	m light by las	ser diffraction	n.	
	To dote	rmine wave	elength of spect	rum of Mercu	ry light using	g plane diffraction	
11	Grating	and Spectr	ometer.				1
12	To dete	rmine the F	Resolving Power	r of a Plane D	iffraction Gr	ating.	
13	3 To dete	rmine the t	hickness of a th	in paper by m	easuring the	width of the interference	
1.	fringes	produced b	y a wedge-shap	ed Film.			-
14	4 Determ	ination of r	esolving power	telescope.			
1:	Cturder o	fnolorizati	on of sugar soli	ition using po	larimeter.		4
-	. V	aves Moti	on – General, V Polarization, Sp	elocity of Wa	ives, Wave C	Optics, Interference, Interf	erome
Sig			embers (CBoS)		J. Sit	Degen Miss	5.0

Text Books, Reference Books and Others

Text Books Recommended

- 1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- 2. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- 3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- 4. A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.
- 5. Practical Physics B.Sc II: R P Goyal, Shivlal Publications

ReferenceBooks Recommended

- 1. Practical Physics by S.L. Gupta and V. Kumar
- 2. Advanced Practical Physics for Students by B.L. Worsnop and H.T. Flint
- 3. B.Sc. Practical Physics by C.L. Arora
- 4. Experimental Physics: Modern Methods by R.A. Dunlap

Online Resources (e-books/ learning portals/ other e-resources)

- Link for e-Books for Physics: Physics Practical: https://egyankosh.ac.in/handle/123456789/82374;
 https://www.lightandmatter.com/lab_223.pdf;
- Virtual Lab: https://vlab.amrita.edu/index.php?sub=1&brch=281
- 3. https://www.compadre.org/books/?ID=70&FID=63273
- 4. https://www.edutech.com/category/higher-education/engineering-labs/virtual-labs-1
- 5. https://phet.colorado.edu/en/simulations/wave-interference
- https://egyankosh.ac.in/handle/123456789/82374

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks

EndSemester Exam(ESE):35 Marks

Continuous InternalAssessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar +Attendance -05 Total Marks - 15	Quiz +Marks o	all be considered
End Semester Exam (ESE):	Laboratory Performance: On spot Assessment Performed the Task based on lab. work Spotting based on tools & technology (written Viva-voce (based on principle/technology)	- 20 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

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FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

Pı	rogram : Bachelor in (Diploma / Degree/		Semester - III	Session: 2024-2025		
1	Course Code		PHSE-	01		
2	Course Title		Introduction to Statis	tical Mechanics		
3	Course Type		Discipline Specifi	c Elective		
4	Pre-requisite (if, any)	As per Program				
5	Course Learning. Outcomes(CLO)	numbers Comprehend physical phe Correlate and laws.	 Differentiate between macrostate and microstate and calculate the numbers Comprehend the concept of ensembles and its requirement in study physical phenomenon Correlate and compare the classical and quantum statistical distribut laws. Apply concepts of statistical distribution laws for different physical 			
6	Credit Value	4 Credits	Credit = 15 Hour	rs -learning & Observation		
7	Total Marks	Max. Marks:	100	Min Passing Marks: 40		

PART -B: CONTENT OF THE COURSE

Total No. of Teaching-learning Periods (01 Hr. per period) - 60 Periods (60 Hours)

Topics (Course Contents)	No. of Period
Maxwellian Distribution of Speeds In An Ideal Gas:	
Distribution of speeds and velocity, experimental verification, distinction between mean, rms and most probable speeds, Doppler broadening of spectral lines, transport phenomena in gases: molecular collision, collision cross section, estimates of molecular diameter and mean free path; transport of mass, momentum and energy and inter-relationship, dependence on temperature and pressure.	15
Andrew's experiment on CO ₂ gas; critical constants.	
Macrostate, Microstate, Number of accessible microstates and Postulate of equal a priori.	
Concept of Ensemble: Concept of Gibb's ensemble, postulate of ensemble average, Micro Canonical, Canonical & Grand Canonical ensembles. Thermodynamic Probability, Postulate of Equilibrium and Boltzmann Entropy relation. Phase space, Phase trajectory, Volume element in phase space, Quantization of phase space and number of accessible microstates for free particle in 1D, free particle in 3D.	15
	Maxwellian Distribution of Speeds In An Ideal Gas: Distribution of speeds and velocity, experimental verification, distinction between mean, rms and most probable speeds, Doppler broadening of spectral lines, transport phenomena in gases: molecular collision, collision cross section, estimates of molecular diameter and mean free path; transport of mass, momentum and energy and inter-relationship, dependence on temperature and pressure. Behaviour of Real Gases: deviation from ideal gas equation, the Virial equation, Andrew's experiment on CO ₂ gas; critical constants. Macrostate & Microstate Macrostate, Microstate, Number of accessible microstates and Postulate of equal a priori. Concept of Ensemble: Concept of Gibb's ensemble, postulate of ensemble average, Micro Canonical, Canonical & Grand Canonical ensembles. Thermodynamic Probability, Postulate of Equilibrium and Boltzmann Entropy relation. Phase space, Phase trajectory, Volume element in phase space, Quantization of phase space and

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	Transition to quantum statistics: h as a natural constant and its implications, cases
	of particle in 1D and 1Dimensional harmonic oscillator,
	Quantum Statistical Distribution Laws: In-distinguishability of particles and its
15	consequences, Bose-Einstein & Fermi Dirac statistics. Comparison of statistical
	distribution laws and their physical significance. Canonical Distribution Law:
	Boltzmann's Canonical Distribution Law, Boltzmann's Partition Function, Proof of
	Equipartition Theorem (Law of Equipartition of energy) and relation between
	Partition function and Thermodynamic potentials.
	Bose-Einstein Distribution Law and its Applications: Bose-Einstein Statistics:
	Heat capacity, Bose Einstein condensation, Radiation as a photon gas, Quantum
	Theory of Radiation: Spectral Distribution of Black Body Radiation. Planck's
	Quantum Postulates. Planck's Law of Blackbody Radiation: Deduction of (1)
15	Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4)
13	Wien's Displacement law from Planck's law
	Fermi-Dirac Distribution Law and its Applications: Free electrons in a metal,
	Definition of Fermi energy, Determination of Fermi energy at absolute zero, Kinetic
	energy of Fermi gas at absolute zero and concept of Density of States, Specific Heat
	of Metals (Density of Orbitals).

Name and Signature of Convener & Members of CBoS:

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Text Books, Reference Books and Others

Text Books Recommended -

- 1. Unified Physics –II, R P Goyal, Shivlal Agrawal & Sons Publication
- 2. Unified Physics-II, Yugbodh Prakashan
- 3. Unified Physics-II, Navbodh Prakashan

Reference Books Recommended-

- 1. F. Reif, "Statistical Physics (In SI Units): Berkeley Physics Course Vol 5", McGraw Hill, 2017
- 2. B.B. Laud, "Fundamentals of Statistical Mechanics", New Age International Private Limited, 2020
- 3. B.K. Agarwal, M. Eisner, "Statistical Mechanics", New Age International Private Limited, 2007

Online Resources-e-Resources / e-books and e-learning portals

- MIT Open Learning Massachusetts Institute of Technology, https://ocw.mit.edu/courses/8-333statistical-mechanics-i-statistical-mechanics-of-particles-fall-2013/
- National Programme on Technology Enhanced Learning (NPTEL), 2. https://archive.nptel.ac.in/courses/115/103/115103113/,
- 3. https://onlinecourses.nptel.ac.in/noc19 ph10/preview,
- https://archive.nptel.ac.in/courses/115/106/115106126/ 4.
- 5. Uttar Pradesh Higher Education Digital Library, http://heecontent.upsdc.gov.in/SearchContent.aspx
- 6. Swayam Prabha - DTH Channel, https://www.swayamprabha.gov.in/index.php/program/current he/8

PART-D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:

100 Marks

Continuous Internal Assessment(CIA): 30 Marks

End Semester Exam (ESI	E): 70 Marks		
Continuous Internal	Internal Test / Quiz-(2):	20 & 20	Better marks out of the two Test / Quiz
Assessment(CIA):	Assignment/Seminar-	10	+ obtained marks in Assignment shall be
(By Course Teacher)	Total Marks -	30	considered against 30 Marks
End Semester Exam	Two section - A & B		
		Mark; Q2. Short answer type- 5x4 =20Marks	
()	Section B: Descriptive answ	ver type qts.	,1out of 2 from each unit-4x10=40Marks

Name and Signature of Convener & Members of CBoS:

FOUR YEAR UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

P	ART-A: INTROD	UCTION		·			
Pr	ogram:Bachelor in (Diploma /Degree)		Semester - IV	Session: 2024-2025			
1	Course Code		PHSE-0	2			
2	Course Title		Mathematical P	Physics-I			
3	Course Type		Discipline Specific	Elective			
4	Pre-requisite (if, any)	As per Program					
5	Course Learning Outcomes(CLO)	probability a lllustrate pro solving them Apply and spherical and	 Revise and apply the knowledge of calculus, vectors, vector calcomprobability and probability distributions in various cases. Illustrate proficiency in writing and solving Differential equation solving them for a given physical system. Apply and interpret the curvilinear coordinates in problems spherical and cylindrical symmetries. Use Dirac Delta function for various physical situation, especially 				
6	Credit Value	4 Credits Credit = 15 Hours -learning & Observation					
7	Total Marks	Max. Marks:					

PART -B: CONTENT OF THE COURSE

Unit	Topics (Course Contents)	No. of Period
I	Calculus: Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions, Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only). Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers. Origin and Evolution of Mathematical concepts in Ancient India: Bhaskaracharya, the Inventor of Calculus: some examples on calculus	16
П	First Order and Second Order Differential equations: First Order Differential Equations and Integrating Factor. Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems.Particular Integral. Orthogonal Curvilinear Coordinates: Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems.	16

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III	Introduction to probability:				
	Independent random variables: Probability distribution functions; binomial, Gaussian,				
	and Poisson, with examples. Mean and variance. Dependent events: Conditional				
	Probability. Bayes' Theorem and the idea of hypothesis testing.				
IV	Dirac Delta function and its properties:				
	Definition of Dirac delta function. Representation as limit of a Gaussian function and				
	rectangular function. Properties of Dirac delta function.				
	Problems based on dirac-delta function and its application				
Keywords	Calculus, Lagrange Multipliers, Homogeneous Equations, Particular Integral, Pr distribution, Dependent events, Dirac delta function	obability			
neyworas	distribution, Dependent events, Dirac delta function				

Signature of Convener & Members (CBoS):

Text Books, Reference Books and Others

Text Books Recommended -

- 1. Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning
- 2. Mathematical Physics, Goswami, 1st edition, Cengage Learning
- 3. Engineering Mathematics, S. Pal and S.C. Bhunia, 2015, Oxford University Press
- 4. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
- 5. Essential Mathematical Methods, K. F. Riley & M.P.Hobson, 2011, Cambridge Univ. Press.
- 6. Mathematical Physics, H.K. Dass and R. Verma, S. Chand & Company

Reference Books Recommended-

- 1. Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn.,
- 2. An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning
- 3. Differential Equations, George F. Simmons, 2007, McGraw Hill.
- 4. Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.

Online Resources-e-Resources / e-books and e-learning portals

- NPTEL online Courses: https://archive.nptel.ac.in/courses/115/105/115105097/
- 2. NPTEL online Courses: https://nptel.ac.in/courses/115103036
- 3. e-gyankosh- https://egyankosh.ac.in/handle/123456789/97951
- 4. Origin and Evolution of Calculus in India: http://mathematical-forum.org/wpcontent/uploads/2021/01/Paper-1.pdf
- https://iks.iitgn.ac.in/wp-content/uploads/2016/02/Development-of-Calculus-in-India-K-Ramasubramanian-MD-Srinivas-2010.pdf
- 6. Indian Mathematics: NPTEL Course: https://nptel.ac.in/courses/111101080

PART-D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods: **Maximum Marks:** 100 Marks Continuous Internal Assessment (CIA): 30 Marks End Semester Exam (ESE): 70 Marks Continuous Internal Internal Test / Quiz-(2): 20 & 20 Better marks out of the two Test / Quiz Assignment/Seminar-10 Assessment(CIA): + obtained marks in Assignment shall be Total Marks -30 considered against 30 Marks (By Course Teacher) Two section - A & B **End Semester** Section A: Q1. Objective – $10 \times 1 = 10 \text{ Mark}$; Q2. Short answer type- $5 \times 4 = 20 \text{Marks}$ Exam (ESE):

Name and Signature of Convener & Members of CBoS:

Section B: Descriptive answer type qts.,1 out of 2 from each unit-4x10=40Marks

FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

(Control of the control of the contr	Program: Bachelor i ertificate/ Diploma/ De Course Code Course Title Course Type		rs)	ster: I	Session: 2024	1-25	
2 3 4	Course Title						
3			ŀ	PHGE-01 T			
4	Course Type			Mechanics			
			Generi	c Elective Co	ourse		
5	Pre-requisite (if any)		As	per Progran	1		
	Course Learning		rough the course, th				
	Outcomes (CLO)	➤ Explain and energy collision ➤ Evaluate of and and Property of the property of the end of the en	nd demonstrate the including their ap and energy transficand calculate momelyze how these proplow of fluids. Special relativistic	principle of copplication in lormation. ent of inertia perties affect the	rious dynamical situationservation of moment real-world scenario s for objects of different he motion of rotating b heir effects on the ma	tum and such as shapes podies.	
			of a moving object.				
6	Credit Value			-,	ning & Observation	1	
7	Total Marks	Maximum N	Marks: 100	Minimum	Pass Marks: 40		
PAR'	T - B: CONTENT OF TH	E COURSE					
	Total No. of Teaching	-learning Peri	iods (01 Hr. per p	eriod) - 45 Pe	eriods (45 Hours)		
Unit Topics (Course contents)						No. of	
						Period	
I	Historical Background: Co biography of Vikram Sarabha Scalar & Vector products of physical significance. Laws of of particles, Concept of Cente Motion of Rocket. Work an gradient of Potential Energy,	ai with his contr two vectors, D of Motion: Revi or of Mass, Motion d Energy: Wo	ribution. Vectors: Serivatives of a vection of Newton's Laton of Center of mass rk-Energy theorem	Scalar and vector, Gradient of ws of motion, Inc., Conservation for conservation	tor quantities &fields, of scalar field and its Dynamics of a system of linear momentum, ive forces, Force as a	12	
II	Rotational Dynamics: Angular momentum, Torque, Conservation of angular momentum, Moment of Inertia, Theorem of parallel and perpendicular axes (statements only), Calculation of Moment of Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Elasticity: Stress & Strain, Hooke's law, Elastic constants, Poisson's Ratio, Relationship between various elastic modulii (without derivation), Work done in twisting a cylinder. Fluid Dynamics: Flow of fluids, Coefficient of viscosity, Derivation of Poiseulli's formula, Motion of a spherical body						
III	falling in a viscous fluid, Stoke's law, Expression for terminal velocity. Gravitation: Newton's Law of Gravitation, Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant), Kepler's Laws (statements only), Satellite in circular orbit and applications, Geosynchronous orbits. Oscillations: Simple harmonic motion, Differential equation of SHM and its solutions, Kinetic and Potential Energy, Total Energy and their time averages, Compound pendulum, Differential equations of damped oscillations and forced oscillations (Conceptual only).						
IV Keywoi	Special Theory of Relativity inertial frames, Outcomes of Relativity, Lorentz Transform of velocity, Relativistic variate Momentum.	r: Frame of refe Michelson Mornation, Length c tion of mass, Ma	rence, Galilean Tra ley's Experiment, P contraction, Time di ass-energy equivale	nsformations, ostulates of Sp lation, Relativ nce, Transforr	pecial Theory of istic transformation	10	

Signature of Convener & Members (CBoS)

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Text Books, Reference Books Recommended and Others

Text Books Recommended-

- 1. Mechanics & Properties of matter, D.C. Tayal & P. Tayal, 2023, Pub. By Authors.
- 2. Unified Physics I -R. P. Goyal, Shivlal Agrawal Publication
- 3. Unified Physics I, Navbodh Publication

Reference Books Recommended-

- 1. Mechanics, Berkeley Physics, vol.1, C. Kittel, W. Knight, et.al. 2007, Tata McGraw-Hill.
- 2. Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
- 3. Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.

Online Resources (e-books/learning portals/other e-resources)

- 1. All e-books of physics https://www.e-booksdirectory.com/listing.php?category=2
- 2. Free physics text book in PDF
- $3. \ https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Km\\ a0VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE$
- 4. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 5. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- NPTEL Online courses https://archive.nptel.ac.in/courses/115/106/115106123/;
- BSc Lectures by Prof. H C Verma: https://bsc.hcverma.in/index.php/course/relativity;
 https://bsc.hcverma.in/index.php/course/relativity;

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuo	us Evaluation Methods:			
Maximum Marks:		100	Marks	
Continuous Internal	Assessment (CIA):	30	Marks	
End Semester Exam		70	Marks	
Continuous Internal	Internal Test/ Quiz (2):	20 + 20	Better marks out of the two Test / Quiz	
Assessment (CIA):	Assignment/ Seminar (1):	10	+ marks obtained in Assignment shall be	
(By course teacher)	Total Marks:	30	considered against 30 Marks	
End Semester	Two section - A & B			
Exam (ESE):	Section A: Q1. Objective - 10 x	e-10 x1=10 Mark; Q2. Short answer type- $5x4=20 Marks$		
	Section B: Descriptive answer ty	pe,1 out of	2 from each unit-4 x 10=40 Marks	

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

PA	RT – A: INTROD					
	Program: Bachelor		Seme	ester: I	Session: 20	24-25
(C	ertificate/ Diploma/ D	Degree/ Honors)				
1	Course Code		PI	HGE- 01 P		
2	Course Title		N	Techanics		
3	Course Type		Generic	Elective Cou	irse	
4	Pre-requisite (if any)		As p	er Program		
5	Course Learning Outcomes (CLO)	experiments. > Record/obse > Analyze record Interpret resures.	king mechan Il be able to quired parts/ erve data as re orded data an alts and checl	ism and laws devices and a equired by the d formulate it c for attainme	of classical marrange them to experimental of to get desired rant of proposed o	perforn pectives esults.
				ics and its ap		
6	Credit Value	01 Credit 1 Cr	edit = 30 Ho	ours Laborat	ory Work	
7	Total Marks	Maximum Mark	ks: 50	Minimum 1	Pass Marks: 20	
PA)	RT – B: CONTEN	T OF THE CO	URSE			
	Total No. of lear	ning-Training/per	formance Pe	eriods- 30 Peri	ods (30 Hours)	
Sr. No	J	t least 10 of the fo	llowing or r	elated Exper	iments)	No. of
1	Measurements of l travelling microsco	ength (or diameter) using verni	er caliper, scr	ew gauge and	30
2	To study the rando					
3	To study the motion				tant and, (b) g.	
4	To determine the N]
5	To determine g and Technique.	d velocity for a free	ely falling bo	ody using Dig	ital Timing	
6	To determine Coef (Poiseuille's metho		y of water by	Capillary Flo	w Method	
7	To determine the		fa Wire by	Ontical Laver	Method	1
8	To determine the N					1
9	To determine the e					-
10				ario p illottion		1
11	To determine the v			ım.		
12						
				11 7 4	Table	1
13	I o deferring Mon	nent of Inertia of ar	i irregular no	ody by inertia	rabie	1
13 eywo	Moment of Inartia Do	nent of Inertia of an ndulum, Vernier Callin e's Method, Cappilary	pers, Screw Gai	uge, Travelling r	nicroscope, Elastic	Constant

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PART - C: Learning Resources

Text Books, Reference Books and others

Text Books Recommended-

- 1. Advanced Practical Physics for students, B.L.Flint&H.T.Worsnop, 1971, Asia Publishing House.
- 2. Engineering Practical Physics, S.Panigrahi& B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- 3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- 4. Practical Physics B.Sc. I: R P Goyal, Shivlal Publications

Reference Books Recommended-

- 1. Advanced Practical Physics for Students by B.L. Worsnop and H.T. Flint
- 2. Practical Physics by G.L. Squires
- 3. An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements by John R. Taylor
- 4. Mechanics and Properties of Matter by J.C. Upadhyaya

Online Resources (e-books/ learning portals/ other e-resources)

1. Link for e-Books for Physics: Physics Practical:

https://www.uou.ac.in/sites//default/files/slm/BSCPH-104.pdf

- 2. Virtual Lab : https://vlab.amrita.edu/?sub=1&brch=74
- 3. https://vlab.amrita.edu/?sub=1&brch=74&sim=571&cnt=1
- https://www.ae,msstate.edu/vlsm/

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:

50 Marks

Continuous Internal Assessment (CIA):

15 Marks

End Semester Exam (ESE):

35 Marks

Continuous Internal Assessment (CIA):

Internal Test / Quiz - (2): 10 Assignment/Seminar + Attendance -

Total Marks -

10 & 10 B

05

15

Better marks out of the two Test/Quiz +Marks obtained in

Assignment shall be considered against 15 Marks

End Semester

(By Course Teacher)

Laboratory Performance: On spot Assessment

Performed the Task based on lab. work

-20 Marks

Managed by Course teacher as per lab.

Exam (ESE):

Spotting based on tools & technology (written) – 10 Marks

Viva-voce (based on principle/technology) - 05 Marks

arks status

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) **DEPARTMENT OF PHYSICS COURSE CURRICULUM**

	T – A: INTRODU						
	Program: Bachelor		Semester: II	Session: 2024	1-25		
	ertificate/ Diploma/ De	egree/ Honors)					
	Course Code		PHGE-02 T				
	Course Title	ELECTRICITY AND MAGNETISM					
	Course Type		Generic Elective Course				
	Pre-requisite (if any)		As per Progran				
	Course Learning Outcomes (CLO)	 State various I magnetism and Apply vector potential, election Compare rise: 	the course, the student show aws related with electrostated electromagnetic induction (electric fields, Coulomb tric potential energy) formated and decay of current in LR, avart law for calculation	ics, dielectric, electric i. 's law) and scalar lisms of electrostatics CR, LCR circuits.	(electri		
		geographic sit	uations.		i omp		
	0 11/1/1		alyze Maxwell's equations.				
	Credit Value		edit= 15 Hours for Lear		n		
	Total Marks	Maximum Marks		Pass Marks: 40			
PART	$\Gamma - B$: CONTENT (OF THE COURS	SE				
	Total No. of Teachin	g-learning Periods	(01 Hr. per period) - 45 f	Periods (45 Hours)			
Unit		Topics (Cor	urse contents)		No.		
I			ew of thermal and hydroele		Perio		
	Chhattisgarh.				12		
	of Vector fields, Gapplication in electron electric flux, Gauss's	auss-divergence theorestatics and magnetost theorem of electrost.	ector fields, Line, surface a rem and Stoke's theorem tatics. Electrostatics field: atics, Applications of Gaus arge, plane charged sheet, o	of vectors and its Electrostatic Field, ss theorem- Electric			
II	of Vector fields, Gapplication in electrocelectric flux, Gauss's field due to point cha Electrostatic potentia a point charge, Calcucapacitor, Energy per Dielectric & Electric Gauss's theorem in Gauss's theorem, current	auss-divergence theorestatics and magnetost theorem of electrostage, infinite line of chall: Electric potential allation of electric field unit volume in electric Currents: Dielectric lielectrics, Parallel plant density J, non – ste	rem and Stoke's theorem tatics. Electrostatics field: atics, Applications of Gausarge, plane charged sheet, cas line integral of electric fid from potential, Capacitan	of vectors and its Electrostatic Field, as theorem- Electric charged conductor. eld, potential due to nice of Parallel plate displacement vector, lled with dielectric.	13		
III	of Vector fields, Gapplication in electroelectric flux, Gauss's field due to point chat Electrostatic potentia a point charge, Calcucapacitor, Energy per Dielectric & Electri Gauss's theorem in Gauss's theorem in Catedy current, curredecay of current in LI Magnetism: Magnet circular coil, solenoic vector potential, Amp Magnetic properties	auss-divergence theorestatics and magnetosis theorem of electrostarge, infinite line of characteristics and the state of the call: Electric potential addition of electric field unit volume in electric Currents: Dielectric field the density J, non – state, CR, LCR circuits. Ostatics: Biot-Savart's discarrying current, Diere's circuital law, of materials: Magnetic statics and magnetic statics and magnetic statics and magnetic statics.	rem and Stoke's theorem tatics. Electrostatics field: atics, Applications of Gausarge, plane charged sheet, cas line integral of electric fid from potential, Capacitatiostatic field. It medium, Polarisation, Date capacitor completely field cardy current and Continuity I law and its applications-wergence and curl of magnitic intensity, magnetic industrials.	of vectors and its Electrostatic Field, ss theorem- Electric harged conductor. eld, potential due to nce of Parallel plate Displacement vector, lled with dielectric. r equation, Rise and straight conductor, etic field, Magnetic ction, permeability,	13		
	of Vector fields, Gapplication in electroelectric flux, Gauss's field due to point chate Electrostatic potential a point charge, Calcucapacitor, Energy per Dielectric & Electric Gauss's theorem in Gauss's theorem in Gauss's theorem in LI Magnetism: Magnetic circular coil, solenoid vector potential, Amp Magnetic properties magnetic susceptibility Electromagnetic Indiand mutual inductance Maxwell's equations	auss-divergence theorestatics and magnetosis theorem of electrostage, infinite line of challed lateric potential addition of electric field unit volume in electric Currents: Dielectric lielectrics, Parallel plant density J, non — stern density Biot-Savart's density densit	rem and Stoke's theorem tatics. Electrostatics field: atics, Applications of Gausarge, plane charged sheet, cas line integral of electric fid from potential, Capacitatostatic field. It medium, Polarisation, Date capacitor completely fixedy current and Continuity and law and its applications-vergence and curl of magnitudes.	of vectors and its Electrostatic Field, ss theorem- Electric harged conductor. eld, potential due to nce of Parallel plate displacement vector, lled with dielectric. r equation, Rise and straight conductor, etic field, Magnetic ction, permeability, etic materials. ion, Lenz's law, self d in magnetic field. tion of continuity of			

Text Books, Reference Books and Others

Text Books

- 1. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- 2. Unified Physics Part II, R. P. Goyal, Shivlal Agrawal and Sons
- 3. Unified Physics Navbodh Publications
- 4. Introduction to Electrodynamics and Electromagnetism, H. C. Verma,

Reference Books

- 1. Vector analysis Schaum's Outline, M.R. Spiegel, S. Lipschutz, D. Spellman, 2nd Edn., 2009, McGraw- Hill Education.
- 2. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

Online Resources (e-books/ learning portals/ other e-resources)

- 1. All e-books of physics https://www.e-booksdirectory.com/listing.php?category=2
- 2. Free physics text book in PDF https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yv6xK1s0Kma0 VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD BwE
- 3. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 4. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- 5. NPTEL Online courses: https://onlinecourses.nptel.ac.in/noc21_ph05/preview
- 6. https://archive.nptel.ac.in/courses/115/104/115104088/
- 7. Classical Electromagnetism 1 (Electrostatics) https://bsc.hcverma.in/course/cee1
- 8. Classical Electromagnetism 2 (Electrostatics) https://bsc.hcverma.in/course/cee2

PART - D: Assessment and Evaluation

Suggested Continuous	Evaluation Methods:		
Maximum Marks:		100 Mark	.s
Continuous Internal A	Assessment (CIA):	30 Mark	S
End Semester Examin	nation (ESE):	70 Mark	S
Continuous Internal Assessment (CIA): (By course teacher)	Internal Test/ Quiz (2): Assignment/ Seminar (1) Total Marks:	20 + 20 10 30	Better marks out of the two Test / Quiz + marks obtained in Assignment shall be considered against 30 Marks
End Semester Examination (ESE):			Mark; Q2. Short answer type- 5x4 =20 Marks ut of 2 from each unit- 4 x 10=40 Marks

Name and Signature of Convener & Members of CBoS:

FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

PA	RT – A: INTRODI	UCTION			
	Program: Bachelor		Semester: II	Session: 2024	1-25
	Certificate/ Diploma/ D	egree/ Honors)			
1	Course Code		PHGE- 02	P	
2	Course Title		Electricity & Ma	gnetism	
3	Course Type		Generic Elective	Course	
4	Pre-requisite (if any)		As per prog	ram	
5	Course Learning Outcomes (CLO)	laws of Electrica Verify var circuits. A experiment Verify var Faraday's measuring Record/ ob recorded d	tion of the course, Students of the course, Students of the service of the course, network of the course of the co	The students will also be theorems, using simplices and arrange them as I construction, working the experimental objective estred results.	able to ple electric to perform Lenz's law, of various es. Analyze
6	Credit Value	01 Credit 1 (Credit = 30 Hours Labor	atory Work	
7	Total Marks	Maximum Mai		Pass Marks: 20	
PA	RT – B: CONTENT	OF THE CO			
			performance Periods - 30	Periods (30 Hours)	
Sr.			following or related Ex		No. of
No.			8	,	Periods
1	To use a Multimeter	for measuring (a	Resistances, (b) AC and	DC Voltages,(c) DC	7 3110 43
	Current, and (d) chee	cking electrical fu	ises.	0 //	30
2	To compare capacita	nces using De'Sa	uty's bridge.		
3	Measurement of field	d strength B and i	ts variation in a Solenoid	Determine (dB/dx).	1
4	To study the Charact	eristics of a Serie	es RC Circuit.		
5	To study a series LC Factor.	R circuit and dete	ermine its (a) Resonant Fr	equency, (b) Quality	
6	(b) Quality factor Q.		etermine its (a) Anti-reson	ant frequency and	
7	To determine a Low				
8	To verify the Theven				
9	To verify the Superp	osition, and Maxi	mum Power Transfer The	orem.	
10	To use a vibration m	agnetometer and	study magnetic field.		
11	Study of magnetic fie				
12	Study of magnetic fie				
13			Solenoid and measurement o	f its magnetic field	
Keyv	Multimeter, Ca	pacitance Compa	arison, Magnetic Field, R tance Measurement, Elect	C Circuit, Series LCR	Circuit,
igna	ture of Convener & Mer		Time	1.1.0h	CII

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Text Books, Reference Books and Others

Text Books Recommended-

- 1. Engineering Practical Physics, S. Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- 2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- 3. Unified Practical Physics: R P Goyal, Shivlal Agrawal & Sons
- 4. Unified Practical Physics: Yugbodh Prakashan
- 5. Unified Practical Physics: Navbodh Prakashan

Reference Books Recommended-

- 1. Basic Electrical and Electronics Engineering by S. K. Bhattacharya
- 2. A Textbook of Electrical Technology by B.L. Theraja and A.K. Theraja (Volumes 1 and 2)
- 3. Engineering Circuit Analysis by William H. Hayt, Jack E. Kemmerly, and Steven M. Durbin
- 4. Practical Physics by G.L. Squires

Online Resources (e-books/learning portals/other e-resources)

- Link for e-Books for Physics: Physics Practical: https://www.uou.ac.in/sites//default/files/slm/BSCPH-104.pdf
- 2. Virtual Lab : https://vlab.amrita.edu/index.php?sub=1&brch=192
- 3. http://emv-au.vlabs.ac.in/#
- 4. https://www.ae.msstate.edu/vlsm/
- 5. https://nationalmaglab.org/magnet-academy/watch-play/interactive-tutorials
- 6. https://jigyasa-csir.in/cgcri/n12-t4-a3/

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:

50 Marks

Continuous Internal Assessment (CIA):

15 Marks

End Semester Exam(ESE):

35 Marks

Continuous Internal Assessment (CIA):	Internal Test / Quiz-(2):	10 & 10		out of the two
(By Course Teacher)	Assignment/Seminar +Attendance – Total Marks -	. 05 15	in Assignme	Marks obtained
		13		gainst 15 Marks
End Semester	Laboratory Performance: On spot A			Managed by
Exam (ESE):	Performed the Task based on lab. w Spotting based on tools & technolog	gy (written) -	- 10 Marks	Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

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FOUR YEARS UNDERGRADUATE PROGRAM (2024-28)

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r	AIXI -						T	
	(6)		chelor in Science		Semester	: I/ III/ V	Session	: 2024-2
1	Course		oma/ Degree/ Hon	ors)	DIIIVAC) d		
2	Course			D L L . 1	PHVAC-0			
3			Renewable Energy and Energy Harvesting					
3 4	Course							
5		uisite (if any) Learning	Ohiostiss - 641		As per Prog			
J		es (CLO)	Objective of the				ledge of re	newable
	Outcom	es (CLO)	energy and they	_				
			Energy cri					
					energy and the			
			> Knowledg		ble energy res		1a.	
6	Credit V	Value	02 Credits		t = 15 Hours-		Observed	• • • •
7	Total M		Maximum Mai		1 – 13 Hours-			
	-					Minimum I	rass Mark	S: ZU
	ARI -	B: CONTI	ENT OF THE	COURS	E			
		otal No. of Tea	iching–learning Pe	eriods (01 Hr	. per period) -	30 Periods (30 Hours)	
	Unit			Topics				No. of
								Period
	I		and Alternate					07
			r limitation, need					
			nitations of non-o				onmental	
			ergy, World energy					
	***		l Energy: Geother					
	II		y: Solar energy,					80
			onvective solar por					
			heater, flat plate					
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			aic (PV) systems, s	_	•			
			ergy: Hydro po			power techi	nologies,	
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	AII		ergy: Biomass res					08
			actors affecting bid					
			iogas from plant oduction from non-			orogramme 1	n india,	
			rgy: Ocean Energ			d and Cal-	n Wasa	
		Characteristic	s and Statistics, Way	ve Energy De	agamst win vices.	u and Solai	r, wave	
	IV	Wind Energ	y harvesting: Fur	ndamentals o	of Wind energy	y, Wind Turb	ines and	07
		different elec	ctrical machines in	wind turbin	es. grid interco	onnection top	ologies.	
	*		Energy harvesti					
		piezoelectric	effect piezoelect	tric material	s Pieznelectr	ic Energy ha	rvecting	

Signature of Convener & Members (CBoS):

applications.

Keywords:

piezoelectric effect, piezoelectric materials, Piezoelectric Energy harvesting

Fossil fuel, Renewable energy sources, Solar energy, Biomass energy, Electromagnetic Energy Harvesting, Piezoelectric Energy harvesting.

PART - C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended-

- 1. Non-conventional energy sources G.D Rai Khanna Publishers, New Delhi
- 2. Solar energy M P Agarwal S Chand and Co. Ltd.
- 3. Solar energy Suhas P Sukhative Tata McGraw Hill Publishing Company Ltd.
- 4. Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
- 5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
- 6. J. Balfour, M. Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

Reference Books Recommended-

- 1. Non-Conventional Energy Resources by B.H. Khan
- 2. Renewable Energy Sources and Emerging Technologies by D.P. Kothari, K.C. Singal, and Rakesh Ranjan
- 3. Solar Energy: Fundamentals, Design, Modelling and Applications by G.N. Tiwari
- 4. Hydropower Development in India: A Sector Assessment by Pradeep Chaturvedi
- 5. Biomass Conversion: The Interface of Biotechnology, Chemistry and Materials Science by Samir K. Khanal, edited by B.C. Meikap and P.K. Bhattacharya
- 6. Ocean Energy: Technology, Environmental Impact and Renewable Energy by Pranav Kumar and T. Balaji
- 7. Wind Energy: Theory and Practice by S. Rao and Dr. B.B. Parulekar
- 8. Piezoelectric Materials and Devices: Applications in Engineering and Medical Sciences by Arun Ghosh

Online Resources (e-books/learning portals/other e-resources)

- 1. http://en.wikipedia.org/wiki/Renewable energy
- 2. Renewable Energy Engineering: Solar, Wind And Biomass Energy Systems Course (nptel.ac.in)
- 3. Technologies For Clean And Renewable Energy Production NPTEL+
- 4. NPTEL :: Mechanical Engineering NOC:Selection Of Nanomaterials For Energy Harvesting And Storage
 Application
- 5. Wind energy Labs: Mechanical Engineering: Amrita Vishwa Vidyapeetham Virtual Lab
- 6. Virtual Labs (vlabs.ac.in)
- 7. https://youtu.be/uY3x7Tycyps

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuo	us Evaluation Method	s:	
Maximum Marks:		50 Marks	
Continuous Internal	Assessment (CIA):	15 Marks	
End Semester Exam	(ESE):	35 Marks	
Continuous Internal	Internal Test/ Quiz- (2	2): 10 + 10	Better marks out of the two Test / Quiz
Assessment (CIA):	Assignment/ Seminar-	+ Attendance- 05	+ marks obtained in Assignment shall
(By course teacher)	Total Marks-	15	be considered against 15 Marks.
End Semester	Two section - A & B		
Examination (ESE):	Section A: Q1. Objecti	ve - 05 x1 = 05 Mark	k; Q2. Short answer type- 5x2 =10Marks
			out of 2 from each unit- 4x05 =20 Marks
Signature of Conven	an P Manchana (CD=C).	1	Jam II . No

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FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

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1	_	rse Code				PF	ISEC- 01		
2	Cou	rse Title			Bas	sic El	ectrical Skill		
3	Cou	rse Type					incement Cours	se	
4	Pre-	requisite (i	f any)				er Program		
5		rse Learnir		On successful co			urse, student is ex	nected to enhan	ce his
	1	comes (CL	_	electrical skill th	rough:	-10 00	arbo, bracerri to on	pooted to dimen	ice ins
	Out	comes (CL	0)			e of a	ccuracy in measur	ing physical qua	antities.
				Using basic	mechanical to	ols.	•		
	i			Using various					
				Fault finding	g and repairing	g sim	ple domestic appli	iances	
6	Cred	dit Value		02 Credits	1 Credit=	15 H	ours for Theore	etical Learnin	g & =
				(1C+1C)			ratory or Field		-
7	Tota	al Marks		Maximum Ma			Minimum Pas		
PA	RT -	- B: CON	TENT	OF THE CO					
						long	ning Periods:		
		Theory - 1!	5 Periods				Training 30 Perio	ds (30 Hours)	
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Mod	dule			Topic	(Course Con	ntent	s)		No. c
						e .			Perio
	1	Measuren	nent: Ide	a about accuracy					
				a about accuracy	in measureme	ent, m	leasuring devices	for commonly	15
		used phys	sical qua	antities (Length,	in measureme Mass, Dens	ent, m sity,	ieasuring devices Temperature, Po	for commonly wer, Current,	15
		used phys Voltage, R	sical qua Lesistance	antities (Length, e, capacitance, inc	Mass, Dens luctance, frequ	sity, uency	Temperature, Po	wer, Current,	15
		used phys Voltage, R D.C. Circ	sical qua tesistance uit : Ohm	antities (Length, e, capacitance, inc es law, Series and	Mass, Dens luctance, frequal parallel resis	sity, uency stance	Temperature, Po etc). circuit, Kirchhof	wer, Current, T's law& their	15
		used physical Voltage, R. D.C. Circal application	sical qua tesistance uit: Ohm n, Primar	antities (Length, e, capacitance, inc as law, Series and y and secondary o	Mass, Dens luctance, frequal l parallel resistells, maintena	sity, uency stance ance o	Temperature, Po etc). circuit, Kirchhof of secondary cells.	wer, Current,	15
		vsed physical Voltage, R. D.C. Circal application A.C. Circal	sical qua tesistance uit: Ohm n, Primar cuits: Ge	antities (Length, e, capacitance, inc as law, Series and y and secondary of eneration of AC	Mass, Dens luctance, frequ l parallel resis cells, maintena voltage, way	sity, uency stance ance o ve sha	Temperature, Poretc). circuit, Kirchhof of secondary cells. ape, frequency, p	wer, Current,	15
		vsed physical voltage, R D.C. Circapplication A.C. Circanstantaneous control visual vi	sical qua tesistance uit: Ohm n, Primar cuits: Ge ous & RN	antities (Length, e, capacitance, income series and secondary concration of AC MS values, idea at	Mass, Dens luctance, frequal parallel resistells, maintenate voltage, way bout R, L, C ci	sity, uency stance on the shape of the shape included inc	Temperature, Poretc). circuit, Kirchhof of secondary cells. ape, frequency, p	ower, Current, It's law& their beak, average,	15
		used physical voltage, R D.C. Circal application A.C. Circal instantaneous Heating &	sical qua desistance uit: Ohm n, Primar cuits: Ge bus & RN t Lightin	antities (Length, c, capacitance, independent of law, Series and y and secondary concration of AC MS values, idea at a geffects of curre	Mass, Dens luctance, freque parallel resistells, maintena voltage, way out R, L, C cient: Joule's la	sity, uency stance once on sha irciuit	Temperature, Po etc). circuit, Kirchhof of secondary cells. ape, frequency, p is electric heating ar	ower, Current, It's law& their beak, average,	15
		used physical voltage, R D.C. Circal application A.C. Circal instantaneous Heating & application	sical qua desistance uit: Ohm n, Primar cuits: Ge bous & RN t Lightin ns, idea o	antities (Length, c, capacitance, inc. capacitance, inc. s law, Series and y and secondary concration of AC MS values, idea at a leg effects of curref commonly used	Mass, Dens luctance, freque parallel resistells, maintena voltage, wave out R, L, C cient: Joule's la lighting bulb,	sity, uency stance on the shall of the shall	Temperature, Po etc). circuit, Kirchhof of secondary cells. ape, frequency, p is electric heating ar , CFL, LED.	f's law& their beak, average, and its domestic	15
		used physical voltage, R. D.C. Circapplication A.C. Circapplication Heating & application Working:	sical qua desistance uit: Ohm n, Primar cuits: Ge ous & RN & Lightin ns, idea o Workin	antities (Length, c, capacitance, inc. capacitance, inc. s law, Series and y and secondary concration of AC MS values, idea at a log effects of curref commonly used g principle of	Mass, Dens luctance, freque parallel resistells, maintena voltage, wave out R, L, C cient: Joule's la lighting bulb,	sity, uency stance on the shall of the shall	Temperature, Po etc). circuit, Kirchhof of secondary cells. ape, frequency, p is electric heating ar	f's law& their beak, average, and its domestic	15
		used physical voltage, R. D.C. Circapplication A.C. Circanstantaneo Heating & application Working: Inverters, I	sical qua tesistance uit: Ohm n, Primar cuits: Ge ous & RN a Lightin ns, idea o Workin Mixer, El	antities (Length, c, capacitance, inc. capacitance, inc. is law, Series and y and secondary of the common of AC AS values, idea at a geffects of current commonly used a principle of ectric heater etc.	Mass, Dens luctance, freque parallel resistells, maintenate voltage, was pout R, L, C cient: Joule's la lighting bulb, Domestic ap	sity, uency stance ance o ve sha irciuit w of o tube, ppliana	Temperature, Po etc). c circuit, Kirchhof of secondary cells. ape, frequency, p s electric heating ar , CFL, LED. ces like electric	f's law& their beak, average, and its domestic fan, Cooler,	15
		used physical voltage, R. D.C. Circapplication A.C. Circapplication Heating & application Working: Inverters, I Safety mea	sical qua desistance uit: Ohm n, Primar cuits: Ge ous & RN & Lightin ns, idea o Workin Mixer, El asureme	antities (Length, c, capacitance, inc. capacitance, inc. is law, Series and y and secondary of the common of AC AS values, idea at a g effects of current of commonly used g principle of ectric heater etc.	Mass, Dens luctance, frequence parallel resisted to the seed of th	sity, uency stance ance o ve sha irciuit w of o tube, ppliana	Temperature, Po etc). circuit, Kirchhof of secondary cells. ape, frequency, p is electric heating ar , CFL, LED.	f's law& their beak, average, and its domestic fan, Cooler,	15
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Signature of Convener & Members (CBoS):

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Text Books, Reference Books and Others

Text Books Recommended-

- 1. A text book in Electrical Technology B L Theraja S Chand and Co.
- 2. Electrical circuits, M Nahvi and J Edminister, Schaum's outline series, Tata McGraw 2005
- 3. Circuit Theory, A Chakraborti, Dhanpat Rai & Co.
- 4. A Text book of electrical technology, Vol.1, B L Thereja, S. Chand & Co, Delhi
- 5. A text book of electrical technology- J B Gupta, SK Kalaria & Sons,
- 6. Principle of electrical engineering- V K Mehta, Rohit Mehta, S. Chand & Co, Delhi Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India

Reference Books Recommended

- 1. Electrical and Electronic Measurements and Instrumentation by R.K. Rajput
- 2. Electrical Workshop: Safety, Commissioning, Maintenance & Testing of Electrical Equipment by R.P. Singh
- 3. Electricity and Magnetism by D.N. Vasudeva

Online Resources (e-books/learning portals/other e-resources)

- 1. National Digital Library- https://ndl.iitkgp.ac.in/
- 2. https://nptel.ac.in/courses/108/108/108 108076/
- 3. Basic Instrumentation Skills Selfstudy Institute
- 4. physics.iisuniv.ac.in

(ESE)

5. https://www.sathyabama.ac.in/sites/default/files/course-material/2020-10/note 1469078786.PDF

PART – D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment (CIA): 15 Marks

End Semester Exam (ESE): 35 Marks

Continuous Internal Internal Test / Quiz-(2): 10 & 10 Better marks out of the two Test

Assessment (CIA): Assignment/Seminar + Attendance - 05 / Quiz + marks obtained in

(By Course Coordinator) Total Marks
15 Assignment shall be considered

against 15 Marks

End Semester Laboratory /Skill Performance: On spot Assessment

Examination A. Performed the Task based on learned skill - 20 Marks

B. Spotting based on tools (written) — 10 Marks

C. Viva-voce (based on principle/technology) - 05 Marks

Signature of Convener & Members (CBoS):

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Evaluation by

Coordinator

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