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

SESSION - 2024 - 25

)N - 2024 – 25	DOE	01 to 02
DSC	C- 01 to 08	D	SE- 01 to 12	DGE- 01 to 02	
	Course Title	Code	Course Title	Code	Course Title
Code	Mechanics	Code	Introduction to Statistical	PHGE- 01 T	Mechanics
PHSC- 01 T	Lab Course	PHSE- 01	Mechanics	PHGE- 01 P	Lab Course
PHSC-01P		-70		PHGE- 02 T	Electricity &
PHSC- 02 T	Electricity & Magnetism	PHSE- 02	Mathematical Physics-I		Magnetism
HSC- 02 P	Lab Course	THSE- 02	1121111	PHGE- 02 P	Lab Course
	Heat &				
PHSC- 03 T	Thermodynamics	PHSE- 03	Nuclear Physics		
PHSC- 03 P	Lab Course				
PHSC-04 T	Waves & Optics	PHSE- 04 T	Numerical Methods &C		VAC
1130-041	77.47.55 57.57		Programming	-	VAC
PHSC- 04 P	Lab Course	PHSE- 04 P	Lab Course		Renewable
PHSC- 05 T	Introduction to	4			Energy and
	Quantum Mechanics	PHSE- 05	Mathematical Physics-II	PHVAC- 01	Energy
PHSC- 05 P	Lab Course		Wathemater		Harvesting
			*		
`HSC- 06 T	Solid State Physics				
	&SolidStateDevices	PHSE- 06	Classical Electrodynamics		
PHSC-06P	Lab Course	PHSE-00	& Electromagnetic theory	SEC	
	Page 1			4	
		PHSE- 07 T	Digital Electronics	_	
PHSC- 07	Classical Mechanics	PHSE- 07 P	Lab Course		BasicElectrical
2		PHSE- 08 T	Operational Amplifier&	PHSEC- 01	Skill
PHSC- 08	Quantum Mechanics		Its Applications		OKIII
		PHSE- 08 P		_	
- C.		PHSE- 09 T		_	
1		PHSE- 09 P		_	
B.		PHSE- 10	Atomic and Molecular		
		DITCE 11	Physics Statistical Mechanics		
		PHSE-11		-	
1 - 8		PHSE- 12 T			
		PHSE- 12 I	Lab Course		. ,

Signature of Convener & Members (CBoS):

John Dung

need Wandkumar Patel

vavidyalaya, Raigarh (C.G.)

Officer-la-Charge (Academic)
Shaheed Nandkumar Patel
Vishwavidyalaya, Raigarh (C.G.)

rogram 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): wet w 15/6/14

andkumar Patel

idyalaya, Raigarh (C.G.)

Officer-In-Charge (Academic) Shaheed Nandkumar Patel ishwavidyalaya, Raigarh (C.G.)

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

71(1.	- A: INTRODUCTION	ON				
P	Program: Bachelor in ificate/ Diploma/ Deg	Science	Semeste		Session: 2024-2	.5
		3100/ 110/10/10/		SC-01T		
1	Course Code		Mo	echanics		
2	Course Title	Discipline Specific Con-				
3	Course Type	Jourse Type As per Program				
4	Pre-requisite (if any)	After going through	the course, the	student sh	ould be able to:	216
5	Course Learning Outcomes (CLO)	 ➢ Analyze and apply and define and an and an analyze ➢ Evaluate and an analyze ➢ Analyze flow of a pescribe specifies 	monstrate the produing their app lenergy transfor calculate momen how these proper fifuids.	rinciple of lication in mation. It of inertion erties affections	arious dynamical situation conservation of momentum real-world scenario sure the motion of rotating between their effects on the maarning &Observation	shapes odies.
6	Credit Value	03 Credits 1 C	redit= 15 Hot	Minimu	m Pass Marks: 40	
7	Total Marks	Maximum Mar	ks: 100	WITHIT	111 1 1100 1111	
PART		HE COURSE			Durinda (AE Hours)	
	TotalNo.of Teachir	g-learning Periods	(01 Hr. per pe	riod) - 45	Periods (45 Hours)	No. of
Unit		Topics (Co	urse contents)			Period
11	Historical Background: biography of Vikram Sara Scalar & Vector products physical significance.Lav system of particles, Conc momentum, Motion of R Force as a gradient of Pot Rotational Dynamics: A	of two vectors, Derive of Motion: Revious of Motion: Revious ept of Center of Masocket. Work and Engential Energy, Consendual Engular momentum, T	ivatives of a vecew of Newton's, Motion of ceergy: Work-Enervation of energy or	ctor, Gradi s Laws of nter of ma rgy theore y, Elastic a ution of any	ent of scalar field and its motion, Dynamics of a ss, Conservation of linea m for conservative forces and in-elastic Collisions gular momentum, Momen Calculation of Moment of	nt 12
1	Rotational Dynamics: Angular momentum, Torque, Conservation of angular moment of 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 Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid Cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid Cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid Cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid Cylinder, solid Inertia of discrete and continuous objects (Rectangular lamina, disc, solid Cylinder, solid Inertia of discrete and con					
	sphere).Elasticity: Stres between various elastic Dynamics : Flow of fluid spherical body falling in	s & Strain, Hooke's modulii (without dods, Coefficient of vis a viscous fluid, Stoke	law, Elastic co erivation), Work cosity, Derivation e's law, Express	nstants, Po done in n of Poise ion for terr	visson's Ratio,Relationsh twisting a cylinder.Fluulli's formula, Motion of minal velocity.	ip id a
ш	sphere).Elasticity: Stres between various elastic Dynamics: Flow of fluid spherical body falling in Gravitation: Newton's in a plane, angular more only), Satellite in circula Oscillations: Simple ha Potential Energy, Tota	s & Strain, Hooke's modulii (without do do, Coefficient of vis a viscous fluid, Stoke Law of Gravitation, lentum is conserved, or orbit and application monic motion, Differ lenergy and their continuation of their continu	law, Elastic co- erivation), Worl- erivation), Worl- erivation, Worl- erivation, Express Motion of a part areal velocity is ons, Geosynchro erintal equation or time averages	nstants, Pook done in of Poise ion for terricle in a constant), nous orbits of SHM as, Compouncentual or	visson's Ratio, Relationsh twisting a cylinder. Fluulli's formula, Motion of minal velocity. Entral force field (motion Kepler's Laws (stateme). Ind its solutions, Kinetic and pendulum, Differently).	is 1 nnts and tial
III	sphere).Elasticity: Stres between various elastic Dynamics: Flow of fluid spherical body falling in Gravitation: Newton's in a plane, angular more only), Satellite in circula Oscillations: Simple hat Potential Energy, Total equations of damped os Special Theory of Relationerial frames, Outcome	s & Strain, Hooke's modulii (without dods, Coefficient of visa viscous fluid, Stoke Law of Gravitation, Internal is conserved, ar orbit and application remonic motion, Differ all Energy and their cillations and forced activity: Frame of referes of Michelson Mornal	law, Elastic co erivation), Work cosity, Derivation e's law, Express Motion of a part areal velocity is ons, Geosynchro crential equation time averages oscillations (Con erence, Galilean reley's Experiment	nstants, Pox done in of Poise ion for terricle in a constant), nous orbits of SHM as, Compounceptual or Transform	visson's Ratio, Relationsh twisting a cylinder. Fluulli's formula, Motion of minal velocity. Entral force field (motion Kepler's Laws (statement of the solutions, Kinetic and pendulum, Different	id ip id is a list of a li

Signature of Convener & Members (CBoS):

Signature of Convener & Members (CBoS):

Signature of Convener & Members (CBoS):

Chairman

ed Nandkumar Patel dyalaya, Raigarh (C.G Officer-In-Charge (Acadamic) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

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

		- A: INTRODU		Semester: I	Session: 202	4-25
10		icate/ Diploma/ D		Semesteri		
1		rse Code	egree Honors)	PHSC-01P		
2		rse Title		Mechanics		
3		rse Type		Discipline Specific C	ourse	
				As per Program		
4		requisite (if any)	After the comm	oletion of the course, S	tudents are expe	ected to
5	Course Learning Outcomes (CLO) After the complete understand works The Students will Assemble requestrements. Record/ obsobjectives. Analyze record			cing mechanism and law ll be able to equired parts/devices and serve data as required orded data and formulate	arrange them to go by the experit to get desired reattainment of p	perform rimental sults.
			objectives re	elated to laws of mechanic	es and its applicati	0115
6	Cre	edit Value	01 Credit 1 Cr	redit = 30 HoursLabora	tory Work	
7		tal Marks	Maximum Mar		Pass Marks: 20	
PA	RT	- B: CONTEN	T OF THE CO	OURSE		
		TotalNo.of lea	rning-Training/pe	rformance Periods-30 Per	riods (30 Hours)	No. of
	r.	Objects (A	at least 10 of the f	ollowing or related Expo	erments)	
						Period
	0.	Managements of				
N	o. I	Measurements of	length (or diamete	r) using vernier caliper, se		Period 30
]	l	travelling microso	length (or diamete	r) using vernier caliper, so	crew gauge and	
	2	To study the moti	length (or diamete cope. om error in observ	r) using vernier caliper, so ations. ad calculate (a) Spring cor	crew gauge and	
2	2 3	To study the rand To study the moti	length (or diamete cope. om error in observe on of the spring and Moment of Inertial	r) using vernier caliper, so ations. ad calculate (a) Spring cor	nstant and, (b) g.	
3	2	To study the rand To study the moti	length (or diamete cope. om error in observe on of the spring and Moment of Inertial	r) using vernier caliper, so ations. ad calculate (a) Spring cor	nstant and, (b) g.	
3	2 3 4	To study the rand To study the moti To determine the To determine g ar	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free	r) using vernier caliper, so ations. ad calculate (a) Spring cor of a Flywheel. eely falling body using D	nstant and, (b) g.	
3	2 3 4	To study the rand To study the moti To determine the To determine g ar Technique. To determine Coe	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a freefficient of Viscosi	r) using vernier caliper, so ations. ad calculate (a) Spring cor	nstant and, (b) g.	
3 2 2 2 2 2	1 2 3 4 5	To study the rand To study the moti To determine the To determine g ar Technique. To determine Coe	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free of Viscosia of Visco	r) using vernier caliper, so ations. Id calculate (a) Spring cor of a Flywheel. eely falling body using Di ty of water by Capillary F	nstant and, (b) g. igital Timing Flow Method	
3 3 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2 3 3 4 5	To study the rand To study the moti To determine the To determine g ar Technique. To determine Coe (Poiseuille's meth	length (or diamete cope. om error in observe on of the spring and Moment of Inertian delocity for a free fficient of Viscosimod). Young's Modulus	r) using vernier caliper, so ations. Indicalculate (a) Spring cor- of a Flywheel. The deely falling body using Distriction of water by Capillary For a Wire by Optical Levers	nstant and, (b) g. igital Timing Flow Method er Method.	
22 33 22 55 66 66 66 66 66 66 66 66 66 66 66 66	1 2 3 3 4 5 5 5 5 6 7 8 8	To study the rand To study the moti To determine the To determine g ar Technique. To determine Coe (Poiseuille's meth To determine the	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free fricient of Viscosition). Young's Modulus of Rigidia	r) using vernier caliper, so ations. ad calculate (a) Spring cor of a Flywheel. eely falling body using Di ty of water by Capillary F of a Wire by Optical Lev	nstant and, (b) g. igital Timing Flow Method er Method.	
	1 2 3 3 4 5 5 6 7 8 8 9 9	To study the rand To study the moti To determine the To determine g ar Technique. To determine Coe (Poiseuille's meth To determine the To determine the	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free fficient of Viscosition). Young's Modulus Modulus of Rigidial elastic constants o	ations. ad calculate (a) Spring cor of a Flywheel. eely falling body using Di ty of water by Capillary F of a Wire by Optical Lev ity of a Wire by Maxwell f a wire by Searle's meth	nstant and, (b) g. igital Timing Flow Method er Method.	
2 3 2 5 6 8 9	1 2 3 3 4 4 5 5 5 6 7 8 9 0 0	To study the rand. To study the motion To determine the To determine grant Technique. To determine Coe (Poiseuille's method To determine the T	length (or diamete cope. om error in observe on of the spring and Moment of Inertian and velocity for a free fficient of Viscosimod). Young's Modulus Modulus of Rigidial elastic constants of value of gusing B	r) using vernier caliper, so ations. ad calculate (a) Spring cor of a Flywheel. eely falling body using Dity of water by Capillary For a Wire by Optical Levity of a Wire by Maxwell f a wire by Searle's mether Pendulum.	nstant and, (b) g. igital Timing Flow Method er Method.	
2 2 3 4 5 (3 1 1	1 2 3 3 4 5 5 7 8 9 0 1	To study the rand To study the moti To study the moti To determine the To determine g ar Technique. To determine Coe (Poiseuille's meth To determine the	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free fricient of Viscosition). Young's Modulus Modulus of Rigidial elastic constants of value of gusing Beauty cantile	r) using vernier caliper, so ations. Indicalculate (a) Spring cor of a Flywheel. It is greater than the self of a Wire by Capillary For a Wire by Maxwell of a wire by Searle's method ar Pendulum. Inter's Pendulum.	nstant and, (b) g. igital Timing Flow Method er Method. er Method. od	
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2 2 3 3 4 5 6 7 1 1 1 1	1 2 3 4 5 5 7 8 9 0 1 2 3	To study the rand To study the moti To study the moti To determine the To determine g ar Technique. To determine Coe (Poiseuille's meth To determine the Study of bending To determine Mo	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free fficient of Viscosimod). Young's Modulus Modulus of Rigidial elastic constants of value of gusing Benefic value of gusing Kof a beam/cantile ment of Inertia of	ations. ad calculate (a) Spring cor of a Flywheel. eely falling body using De ty of water by Capillary F of a Wire by Optical Lev ity of a Wire by Maxwell f a wire by Searle's meth ar Pendulum. Later's Pendulum. ver an irregular body by Iner- iners Strey Gause, Trayelling	nstant and, (b) g. igital Timing Flow Method er Method. 's needle. od tia Table	30
2 2 3 3 4 5 5 6 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	1 2 3 4 5 5 5 6 7 8 9 0 1 2 3 words	travelling microsor. To study the rand. To study the motion of the motio	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free fficient of Viscosition). Young's Modulus Modulus of Rigidicelastic constants of value of gusing Benedic value of gusing Kof a beam/ cantilement of Inertia of Pendulum, Vernier Call	ations. ad calculate (a) Spring cor of a Flywheel. eely falling body using D ty of water by Capillary F of a Wire by Optical Lev ity of a Wire by Maxwell f a wire by Searle's mether ar Pendulum. Later's Pendulum. ver an irregular body by Iner- ipers, Screw Gauge, Travelling	nstant and, (b) g. igital Timing Flow Method er Method. 's needle. od tia Table g microscope, Elastic rface Tension	30
2 3 3 4 4 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	1 2 3 4 5 5 5 6 7 8 9 0 1 2 3 words	To study the rand To study the moti To study the moti To determine the To determine g ar Technique. To determine Coe (Poiseuille's meth To determine the Study of bending To determine Mo	length (or diamete cope. om error in observe on of the spring and Moment of Inertiand velocity for a free fficient of Viscosition). Young's Modulus Modulus of Rigidicelastic constants of value of gusing Benedic value of gusing Kof a beam/ cantilement of Inertia of Pendulum, Vernier Call	ations. ad calculate (a) Spring corof a Flywheel. eely falling body using Dety of a Wire by Capillary For a Wire by Maxwell fa wire by Searle's mether ar Pendulum. Eater's Pendulum. Eater's Pendulum. Ver an irregular body by Inergipers, Screw Gauge, Travelling Rise Method, Viscosity, Sur	nstant and, (b) g. igital Timing Flow Method er Method. 's needle. od tia Table	30

Chairman

of Studies Andkumar Patel Idyalaya, Raigarh (C.G.)

Officer-In-Charge (Actionalis) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

PART – C: LEARNING RESOURCES

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 $a 0 VR0AWG lich RwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE$
- 4. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 5. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- 6. 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/cml

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA):30 Marks

Continuous Internal As	350551110111 ()	
End Semester Examina	tion (ESE): 70 Marks	Better marks out of the two Test / Quiz
Assessment (CIA):	Internal Test/ Quiz (2): 20 20 Assignment/ Seminar (1):10	t terinod in Assignment shall
` '	Total Marks: 30 Two section – A & B	5×4 =20Marks

End Semester Exam (ESE):

Two section - A & B

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

Name and Signature of Convener & Members of CBC

aya, Raigarh (C.G.)

Officer-In-Charge (Academic) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

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:

50 Marks

Continuous Internal Assessment(CIA):15 Marks

EndSemester Exam(ESE):35 Marks

Continuous	Internal Test / Quiz - (2): 10		arks out of the two
InternalAssessment(CI		Test/Quiz	+Marks obtained in
(By Course Teacher)	Assignment/Seminar +Attendance -	05 Assignmer	nt shall be considered
	1 Otal Walks -	15 against 15	Marks
End Semester	Laboratory Performance: On spot Ass	sessment	Managed by Course
	Performed the Task based on lab. wor	k -20	teacher as per lab.
Exam (ESE):	Marks	status	
	Spotting based on tools & technology (written) – 10	
	Marks	ngv) - 05	
	Viva-voce (based on principle/technology	ogy) - 05	
	Marks		

Name and Signature of Convener & Members of CBoS.

M Siell Rid Deword

S. Ol Sur orways

w + 10/6/24

eed Nandkumar Patel Idyalaya, Raigarh (C.G

Officer-In-Charge (Academic) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

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

			COURSE CUI	ddconom		CONTRACTOR OF THE PARTY OF THE
AR	-T	A: INTRODUC	CTION			
		ogram: Bachelor ii		Semester: II	Session: 2024	25
(C		icate/ Diploma/ De				
1	Cou	rse Code		PHSC-02T		
2	Cou	rse Title		ELECTRICITY AND MAC	ENETISM	
3		rse Type		Discipline Specific (Course	
4		requisite (if any)		As per Progra		
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 (electric potential, electric potential energy) formalisms of electrostatics. Compare rise and decay of current in LR, CR, LCR circuits. Apply Biot-Savart law for calculation of magnetic field in geographic situations.			electric		
			Derive and a	nalyze Maxwell's equations	3.	
6		edit Value		edit= 15 Hours for Lea		
7		tal Marks	Maximum Mark		n Pass Marks: 40	
PA	RT -	- B: CONTENT				
		TotalNo.of Teachir	ng-learning Periods	(01 Hr. per period) - 45	Periods (45 Hours)	
Ur	ıit		Topics (C	ourse contents)		No. o Perio
I		in Chhattisgarh. Vector Analysis: E of Vector fields, application in election in election flux, Gaussi	Divergence & Curl of Gauss-divergence the trostatics and magnet s's theorem of electro	rview of thermal and hydro Vector fields, Line, surface corem and Stoke's theorer ostatics. Electrostatics field estatics, Applications of Ga charge, plane charged sheet	and volume integrals n of vectors and its d: Electrostatic Field, auss theorem- Electric	12
I	II Electrostatic potential: Electrostatic potential: Electrostatic potential: Electrostation capacitor, Energy per unit Dielectric & Electric Cu Gauss's theorem in dielectric. Steady current, of the control of the co		ntial:Electric potentia lculation of electric f per unit volume in elec tric Currents: Diele in dielectrics, Par	I as line integral of electric ield from potential, Capaci etrostatic field. etric medium, Polarisation, allel plate capacitor co J, non – steady current an	field, potential due to tance of Parallel plate Displacement vector, mpletely filled with	13
III Magnetism: Magnetism: Magnetism circular coil, solen vector potential, A Magnetic propertie		Magnetism: Magnetircular coil, solen vector potential, A Magnetic propertionagnetic susceptil	netostatics: Biot-Sava noid carrying current, mpere's circuital law, es of materials: Mag pility, Brief introducti	ort's law and its application Divergence and curl of manetic intensity, magnetic intensity on of dia, para and ferro-manetic in	agnetic field, Magnetic aduction, permeability, agnetic materials.	
]	magnetic susceptibility, Brief introduction of dia, para and ferro-magnetic materials. IV Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils, Energy stored in magnetic field. Maxwell's equations and Electromagnetic wave propagation: Equation of continuity					
		of current Displac	cement current Mayu	ell's equations, Wave equat	tion in free space	

Chairman of Studies

Officer-In-Charge (Assolution) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

PART - C: LEARNING RESOURCES

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)

- I. 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 VROAWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE
- 3. Cambridge University Books for Physics https://www.cambridgeindla.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) <u>https://bsc.hcverma.in/course/cee2</u>

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

Name and Signature of Convener & Members of CBoS:

idkumar Patel

iyalaya, Raigarh (C.G

Officer-In-Charge (AL Shaheed Nandkumar Patel /ishwavidyalaya, Raigarh (C.G.)

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

PAR	RT - A: 1	INTRODUC	CTION	CORRICOLOM		
		n:Bachelor in		Semester: 11	Session: 2024-2	5
(Cc	rtificate/	Diploma/ Deg	gree/ Honors)			
1	Course Co	ode		PHSC-	02P	
_	Course Ti			Electricity & f	Angnetism	and the second second second
	Course Ty	•		Discipline Spec		
		site (if any)		As per pr	ogram	
5	Course L			ipletion of the course, S	tudents are expected to un	
		After the completion of the course, Students are expected to under working laws of Electricity, Magnetism and EMIVs. The students will a able to > Verify various circuit laws, network theorems, using simple experiments. > Verify various laws in electricity and magnetism such as Lenz Faraday's law and learn about the construction, working of y measuring instruments > Record/observe data as required by the experimental objectives. A recorded data and formulate it to get desired results. > Interpret results and check for attainment of proposed objectives to laws of Electricity, Magnetism and its applications				
6	Credit V	17.20 YE 10.00		1 Credit = 30 Hours La		
7	Total Ma		Maximum N	The state of the s	m Pass Marks: 20	
PA	RT - B	CONTEN	T OF THE O	COURSE		
		TotalNo.of le	earning-Trainir	ng/performance Periods	-30 Perlods (30 Hours)	
Sr	1	Objects ((At least 10 of	the following or related	Experiments)	No. of
No						Periods
1				g (a) Resistances, (b) AC	and DCVoltages,(c) DC	
<u>_</u>			ecking electrica			30
2				e'Sauty's bridge.		
3					noid Determine (dB/dx).	
4				Series RC Circuit.		
5		-	CK circuit and	determine its (a) Resona	nt Frequency, (b) Quality	
 	Facto		r op ' '			1
6		tudy a parallel ity factor Q.	LCK circuit ar	ia determine its (a) Anti-	esonant frequency and(b)	
7			w Resistance h	y Carey Foster's Bridge.		1
			enin and Norto			1,
				Maximum Power Transfe	r Theorem	+
_				and study magnetic field		- 1
			field due to a			-
		·		eflection Magnetometer		1
-			_	y of Solenoid and measure	ment of its magnetic field	-
	eywords:	Multimeter,	Capacitance C		eld, RC Circuit, Series LC	R Circui
L		1 1 11 11 11 11 11 11	/ / / /		1	A

SignatureofConvener&Members (CBoS):

d Nandkumar Patel dyalaya, Raigarh (C.G.)

Officer-In-Charge (Managemba)
Shaheed Nandkumar Patel
Vishwavidyalaya, Raigarh (C.G.)

PART - C: LEARNING RESOURCES

Text Books, Reference Books and Others

Text Books Recommended-

- 1. Engineering Practical Physics, S.Panigrahl&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: 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
- 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

EndSemester Exam(ESE):35 Marks

Continuous InternalAssessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05 Total Marks - 15	Test / Quiz +	out of the two Marks obtained in shall be considered arks
End Semester Exam (ESE):	Spotting based on tools & technology (written)	20 Marks –10 Marks –05 Marks	Managed by Course teacher as per lab. status

Name and Signature of Convener & Members of CBoS:

Chairman

of Studiesed Nand yumar Patel

idyalaya, Baigarh (C.G.)

Officer-In-Charge (Alexandra)
Shaheed Nandkumar Patel
Shwavidyalaya, Raigarh (C.G.)

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

	Program: Bachelor i tificate/ Diploma/ De		Semes		Session: 2024	1-25
1	Course Code			HGE-01 T		
2	Course Title			Mechanics		
3	Course Type	Generic Elective Course				
4	Pre-requisite (if any)	1 H (Asj	per Prograi	n	
5	Course Learning Outcomes (CLO)	➤ Explain and den energy includ collision and co Evaluate and co and analyze h Analyze flow of Describe specie	oly the laws of nonstrate the pling their appenergy transford deulate mome ow these propenal relativistic	motion to va principle of colication in rmation, nt of inertia erties affect t effects and t	onservation of moment real-world scenario s for objects of different he motion of rotating be heir effects on the ma	shape odies. uss and
6	Credit Value	03 Credits 1 Cr	edit= 15 Hou	irs for Lear	ning & Observation	A
7	Total Marks	Maximum Marks	s: 100	Minimum	Pass Marks: 40	1 1 1 1
AK	T – B: CONTENT OF TI Total No. of Teachin	g-learning Periods (eriods (45 Hours)	No.
Unit		Topics (Cour	rse contents)			Perio
I	Historical Background: Obiography of Vikram Sarab Scalar & Vector products of physical significance. Laws of particles, Concept of Con Motion of Rocket. Work a	of two vectors, Deriva of Motion: Review of ter of Mass, Motion of	tives of a vect Newton's Lav center of mass,	or, Gradient vs of motion, Conservatio for conservat	of scalar field and its Dynamics of a system n of linear momentum, ive forces, Force as a	
II	of particles, Concept of Center of Mass, Motion of center of mass, Conservative forces, Force as a Motion of Rocket. Work and Energy: Work-Energy theorem for conservative forces, Force as a gradient of Potential Energy, Conservation of energy, Elastic and in-clastic Collisions 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). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere). Inertia of discrete and continuous objects (Rectangular lamina, disc, solid cylinder, solid sphere).					
			velocity is co	nstant), Kepl	orce field (motion is in er's Laws (statements	11
III	Gravitation: Newton's Lara plane, angular momentu only), Satellite in circular o Oscillations: Simple harm Potential Energy, Total Engof damped oscillations and Special Theory of Relative	m is conserved, areal orbit and applications, Conic motion, Differentions and their time aver	ial equation of rages, Compou	SHM and its nd pendulum	solutions, Kinetic and Differential equations	10

Signature of Convener & Members (CBoS) :

of Stadies.... Ped Nandkumar Patel Idyalaya, Raigarh (C.G.

Officer-In-Charge (Ac. W. 1945) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

5 John

PART - C: LEARNING RESOURCES

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 1 -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_EiwAjkNDp5v8Yy6xK1s0Kma0VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoClLsQAvD_BwE
- 4. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 5. Books for solving physics problems https://bookboon.com/en/physics-cbooks
- 6. NPTEL Online courses 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: Continuous Internal Assessment (CIA):		30	Marks Marks
End Semester Examina	ation (ESE):		Marks Test / Ouiz
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

Exam (ESE): Section A: Q1. Objective = Reserved Section B: Descriptive answer

End Semester

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

Name and Signature of Convener & Members of CBoS:

Chairman

eed Nandkumar Patel idyalaya, Raigarh (C.G.

> Officer-In-Charge (Audicardic) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

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

		COURSEC	URRICULUM				
PA	RT – A: INTROD	UCTION		the ball to control to be a second to the se			
	Program: Bachelor	· in Science	Semester: I	Session: 20	124-25		
(C	ertificate/ Diploma/ I		otilitate 1				
1	Course Code		PHGE-01 P				
2	Course Title		Mechanics				
3	Course Type		Generic Elective Cou	rse .			
4	Pre-requisite (if any)		As per Program				
5	Course Learning	After the compl	etion of the course, Stu	idents are exp	ected to		
	Outcomes (CLO)	understand worki	ing mechanism and laws	of classical me	echanics.		
		The Candonio will	he able to				
		> Assemble req	uired parts/devices and a	rrange them to	pertorm		
		AC 4000 N					
		> D 1/-b	ve data as required by the	experimental of	gectives.		
			1. 1 date and formulate II	to agracan	000		
		► Interpret resul	is and check for attainmen	t of brobosed o	ojectives		
		related to laws	s of mechanics and its app	Ilcations			
6	Credit Value	01 Credit 1 Cre	dit = 30 Hours Laborate	ry work			
7	Total Marks	Maximum Marks	:: 50 Minimum P	ass Marks: 20			
PΔ	DT P. CONTEN	T OF THE COL	JRSE				
	Tatal No. of loar	ning-Training/perfo	ormance Periods- 30 Perio	ds (30 Hours)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
Sr	Objects (A	t least 10 of the foll	lowing or related Experi	ments)	No. of Period		
No.					renou		
1	Measurements of l	ength (or diameter)	using vernier caliper, scre	w gauge and	30		
	travelling microsco	pe.	ons				
2	To study the rando	m error in observati	calculate (a) Spring const	ant and, (b) g.	1		
3	To study the motio	n of the spring and Ioment of Inertia of	a Flywheel.				
<u>4</u> 5	To determine g and	velocity for a freel	y falling body using Digi	tal Timing	1		
3	Tachnique						
6	To determine Coef	ficient of Viscosity	of water by Capillary Flo	w Method			
	(Poiseuille's metho	d).					
7	To determine the Y	oung's Modulus of	a Wire by Optical Lever	pedle			
8	To determine the M	lodulus of Kigidity	of a Wire by Maxwell's r	iccure.			
9	To determine the el	asuc constants of a	wire by Searle's method	· · · · · · · · · · · · · · · · · · ·			
10	To determine the va			,0			
11	Study of bending of			1	1		
$\frac{12}{13}$			irregular body by Inertia	Table	4		
	Moment of Inertia, Pen	dulum, Vernier Callipe	rs, Screw Gauge, Travelling m	icroscope, Elastic	Constant,		
ey wor	Searle's Method, Stoke	's Method, Cappilary R	lise Method, Viscosity, Surface	e Tension			
ignat	ure of Convener & Me	mbers (CBoS) :	angom / 1	b SV	11_		
(21/ 1/2	Jud	Dangow Made				

eed Nandkumar Patel idyalaya, Raigarh (C.G. Officer-In-Charge (All Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.)

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:

50 Marks

Continuous Internal Assessment (CIA):

15 Marks

End Semester Exam (ESE):

35 Marks

Continuous Internal Assessment (CIA):

Internal Test / Quiz - (2): 10 & 10 Assignment/Seminar +Attendance -05

Better marks

out of Test/Quiz +Marks obtained in

Total Marks -15

Assignment shall be considered against 15 Marks

End Semester Exam (ESE):

(By Course Teacher)

Laboratory Performance: On spot Assessment Performed the Task based on lab. work

-20 Marks

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

Managed by Course teacher as per lab.

Viva-voce (based on principle/technology)

status

Name and Signature of Convener & Members of CBoS:

eed Nandkumar Patet dyalaya, n

> Officer-In-Charge (Cardanic) Shaheed Nandkumar Patel /shwavidyalaya, Raigarh (C.G.)

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

	Program: Bachelor i	n Science	Semes	ter: II	Session: 2024	1-25
1 Co	lificate/ Diploma/ De ourse Code	gree/ Honors)				
		PHGE-02 T				
	ourse Title	ELECTRICITY AND MAGNETISM				
	ourse Type		Generic	Elective Co	urse	
	e-requisite (if any)			er Program		
5 Course Learning Outcomes (CLO)		magnetism and	aws related wi d electromagno (electric fiele	th electrostation induction. ds. Coulomb'	cs, dielectric, electric	(electric
		 Compare rise of Apply Biot-Signographic site Derive and any 	and decay of c avart law for uations.	urrent in LR, (calculation of	of magnetic field in	ı simpl
6 C	redit Value			rs for Learn	ing & Observatio	11
7 T	Total Marks Maximum Marks: 100 Minimum Pass Marks: 40					
PART	- B: CONTENT O	g-learning Periods	SE (01 Hr. per pe	eriod) - 45 Pe	eriods (45 Hours)	
Unit		Topics (Cor	irse contents	s)		No. o Perioc
T T	Power plants in Chhattisgarh: An overview of thermal and hydroelectric power plants in Chhattisgarh. Vector Analysis: Divergence & Curl of Vector fields, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors and its application in electrostatics and magnetostatics. Electrostatics field: Electrostatic Field, electric flux, Gauss's theorem of electrostatics, Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, plane charged sheet, charged conductor.			12		
	Chhattisgarh. Vector Analysis: Di of Vector fields, G application in electric flux, Gauss's	vergence & Curl of V auss-divergence theo ostatics and magnetos theorem of electrost	ector fields, Lorem and Stok tatics. Electro atics, Applicat arge, plane cha	ine, surface ar ce's theorem statics field: tions of Gauss arged sheet, cl	nd volume integrals of vectors and its Electrostatic Field, is theorem- Electric parged conductor.	
II	Chhattisgarh. Vector Analysis: Di of Vector fields, G application in electro electric flux, Gauss's field due to point cha Electrostatic potent a point charge, Calc capacitor, Energy pe Dielectric & Electr Gauss's theorem in Steady current, curre decay of current in L	vergence & Curl of V auss-divergence theo estatics and magnetos theorem of electrostage, infinite line of chial: Electric potential ulation of electric field unit volume in electric Currents: Dielectric dielectrics, Parallel plant density J, non – star, CR, LCR circuits.	ector fields, Lorem and Stok tatics. Electro atics, Applicat arge, plane cha as line integral d from potent ostatic field. ic medium, Potent ate capacitor eady current a	ine, surface are's theorem statics field: tions of Gaussarged sheet, cl of electric field, Capacitan olarisation, Decompletely fill nd Continuity	nd volume integrals of vectors and its Electrostatic Field, is theorem- Electric harged conductor. Eld, potential due to ce of Parallel plate isplacement vector, led with dielectric. equation, Rise and	13
•	Chhattisgarh. Vector Analysis: Di of Vector fields, G application in electric electric flux, Gauss's field due to point cha Electrostatic potent a point charge, Calc capacitor, Energy pe Dielectric & Electr Gauss's theorem in Steady current, curre decay of current in L Magnetism: Magne circular coil, solenoi vector potential, Am	vergence & Curl of V auss-divergence theo estatics and magnetos theorem of electrost urge, infinite line of chial: Electric potential ulation of electric fiel r unit volume in electric dielectrics, Parallel plent density J, non – stern R, CR, LCR circuits. tostatics: Biot-Savart d carrying current, Di	ector fields, Lerem and Stok tatics. Electro arics, Applicat arge, plane cha as line integral d from potent ostatic field. ic medium, Potent ate capacitor and seady current a seady current and its evergence and	ine, surface are te's theorem statics field: tions of Gaussarged sheet, cl of electric field, Capacitan clarisation, Discompletely fill nd Continuity applications-curl of magnetic induragnetic indures	and volume integrals of vectors and its Electrostatic Field, is theorem- Electric harged conductor. Eld, potential due to ce of Parallel plate isplacement vector, led with dielectric, equation, Rise and straight conductor, etic field, Magnetic etion, permeability,	

Signature of Convener & Members (CBoS):

Chairman \

eed Nandkumar Patel idyalaya, Raigarh (C.G.) Officer-In-Charge (Acceptable)
Shaheed Nandkumar Patel
Vishwavidyalaya, Raigarh (C.G.)

PART - C: LEARNING RESOURCES

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)

- I. 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

Continuous Internal		
End Semester Examin		
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 Examination (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 1 Section B: Descriptive answer type, 1	0 Mark; Q2. Short answer type- 5x4 =20 Marks out of 2 from each unit- 4 x 10=40 Marks
Name and Signature of C	Convener & Members of CBoS:	16 W 10/6/24 S. De

Chairman

of Studies eed Nandkumar Patel

vidyalaya, Raigarh (C.G.)

Officer-In-Charge (Academic) Shaheed Nandkumar Patel /ishwavidyalaya, Raigarh (C.G.)

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

PA	RT-A: INTROD	UCTION	ORRICOLOM		
	Program: Bachelor	in Science	Semester: II	0 1 000	105
(0	Certificate/ Diploma/ D	Ocarce/ Honores	Semester: II	Session: 202	4-25
1	Course Code	Tigree, Honors)	PHGE- 02	D	
2	Course Title		Electricity & Ma		
3	Course Type		Generic Elective		
4	Pre-requisite (if any)				
5	Course Learning	After the complete	As per progr on of the course, Students a		and working
// // //	Outcomes (CLO)	laws of Electricity Verify vario circuits. Ass. experiments. Verify varios Faraday's le measuring in Record/ obse recorded date Interpret ress	o, Magnetism and EMWs. To ous circuit laws, network emble required parts/devic us laws in electricity and aw and learn about the c	the students will also be theorems, using simples and arrange them magnetism such as a construction, working experimental objective sired results. Int of proposed objecti	e able to ple electric to perform Lenz's law, of various es Analyze
6	Credit Value	01 Credit 1 Cre	edit = 30 Hours Labora	tory Work	
7	Total Marks	Maximum Marks		ss Marks: 20	
PA	RT – B: CONTENT			. 11 . 1	715 (
			rformance Periods - 30 P	eriods (30 Hours)	
Sr.			ollowing or related Expe		No. of
No.					Periods
1	To use a Multimeter	for measuring (a) R	esistances, (b) AC and D	C Voltages,(c) DC	r.
	Current, and (d) chec			And the second of the second	30
2	To compare capacitat			chat '	
3			variation in a Solenoid I	Determine (dB/dx).	
4	To study the Characte			4) 6	1
5	Factor.	R circuit and determ	nine its (a) Resonant Freq	uency, (b) Quality	V. 1
6		CR circuit and deter	mine its (a) Anti-resonan	t frequency and	
7	To determine a Low I	Resistance by Carey	Foster's Bridge.	Mark the state of the state of	5
8	To verify the Theveni			y's and will be	. 177 1 1
9	To verify the Superpo	sition, and Maximu	ım Power Transfer Theor	em.	re l
10	To use a vibration ma			The Marian	
11	Study of magnetic fiel		•	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
12	Study of magnetic fiel	ds using Deflection	Magnetometer		
13	Mini Project: Constructi	on and Study of Sole	enoid and measurement of i	ts magnetic field	
Keyw	Multimeter, Cap	pacitance Comparis	on, Magnetic Field, RC ce Measurement, Electric	Circuit, Series LCR	Circuit,

Signature of Convener & Members (CBoS)

Chairman

d of Studies heed Narry dimar Patel avidyalaya, Raigarh (C.G.)

Officer-In-Charge (Consense) Shaheed Nandkumar Patel Shwavidyalaya, Raigarh (C.G.)

PART - C: LEARNING RESOURCES

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: 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)

- 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/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: 50 Marks Maximum Marks: 15 Marks Continuous Internal Assessment (CIA): 35 Marks End Samaster Evam(ESE)

Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): Assignment/Seminar +Attendance – Total Marks -	10 & 10 05 15	Test / Quiz +	out of the two Marks obtained nt shall be gainst 15 Marks
End Semester Exam (ESE):	Laboratory Performance: On spot A Performed the Task based on lab. w Spotting based on tools & technolog	ork -	20 Marks	Managed by Course teacher as per lab. status

Viva-voce (based on principle/technology) Name and Signature of Convener & Members of CBoS:

ndkumar Patel

ridyalaya, Raigarh (C.G

Officer-In-Charge (Academie) Shaheed Nandkumar Patel Ashwavidyalaya, Raigarh (C.G.)

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

	Program: Bac	helor in Science	Semester: I/III/V	Session: 2024-25				
	(Certificate/ Diplo	ma/ Degree/ Honors)						
1	Course Code		PHVAC-01					
2	Course Title	Renewable	Energy and Energy Harvo	esting				
3	Course Type	V	Value Addition Course					
4	Pre-requisite (if any)	As per Program						
5	Course Learning Outcomes (CLO)	Renewable sources ofAvailability of renewa	d to learn about: al and international scenarion energy and their importance ble energy resources in Ind	o. e. ia.				
6	Credit Value	02 Credits 1 Credit		ass Marks: 20				
7	Total Marks	Maximum Marks: 50	IVIIIIIII 2					

T	otal No. of Teaching-learning Periods (01 Hr. per period) - 30 Periods (30 Hours)	No. of
Unit	Topics	Period 07
ľ	Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. Limitations of non-conventional energy resources. Environmental aspect of energy, World energy status, Energy scenario in India.	07
II	aspect of energy, World energy status, Energy Geo thermal Energy: Geothermal Resources, Geo thermal Technologies. Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non-convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, sun tracking systems. Hydro Energy: Hydro power resources, hydro power technologies, environmental impact of hydro power sources.	08
111	Biomass energy: Biomass resources, Biomass conversion technology, biogas generation, factors affecting bio-digestion, working of biogas plant (with block diagram), biogas from plant waste, biomass energy programme in India, Biodiesel production from non-edible oil seeds. Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.	08
IV	Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines. grid interconnection topologies. Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect, piezoelectric materials, Piezoelectric Energy harvesting applications.	07
(eywords:	Fossil fuel, Renewable energy sources, Solar energy, Biomass energy, Electron Energy Harvesting, Piezoelectric Energy harvesting.	magneti

Signature of Convener & Members (CBoS):

of Studies کرده کوده العصور Vidyalaya, Raigarh (C.G

Officer-In-Charge And Market Shaheed Nandkumar Patel Shaheed Nandkumar Patel Shaheed Nandkumar Patel (C.G.)

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
- Solar energy M P Agarwal S Chand and Co. Ltd.
- 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.
- 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/uY3x7Tycyp2

PART – D: ASSESSMENT AND EVALUATION

Suggested Continuou	us Evaluation Method	ls:	
Maximum Marks:		50 Marks	
Continuous Internal	Assessment (CIA):	15 Marks	
End Semester Exam		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 & I	3	
Examination (ESE):	Section A: Q1. Object	ivc - 05 x1 = 05 Marl	k; Q2. Short answer type- 5x2 = 10Marks
,	Section B: Descriptive	answer type qts.,1 o	out of 2 from each unit- 4x05 =20 Marks

Signature of Convener & Members (CBoS).

of Studies eed Nandkumar Patel idyalaya, Raigarh (C.G.)

Officer-In-Charge (Malakanic) Shaheed Nandkumar Patel rishwavidyalaya, Raigarh (C.G.)

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

se Code se Title se Type requisite (if rse Learnin comes (CLC dit Value al Marks - B: CON	TENT (On successful celectrical skill the Understandie Using basic Sault finding Oz Credits (1C+1C) Maximum Ma OF THE CO	Basic Skill En As completion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Lab arks: 50 DURSE		pected to enhaning physical quantes tical Learninearning/ Tra	nce his antities.
icate/ Diplose Code se Code se Title requisite (if rse Learnin comes (CLC dit Value al Marks - B: CON Theory - 19	TENT (On successful celectrical skill the Understandie Using basic Using various Fault finding OZ Credits (1C+1C) Maximum Ma OF THE CO	Basic Skill En As completion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Lab arks: 50 DURSE	PHSEC- 01 Electrical Skill hancement Course per Program course, student is exp faccuracy in measuri fruments. mple domestic applia Hours for Theoret poratory or Field I	e pected to enhance ing physical quantes tical Learnin earning/ Tra	nce his antities.
se Code se Title se Type requisite (if rse Learnin comes (CLC dit Value al Marks - B: CON	TENT (On successful celectrical skill the Understanding Using basic Using various Fault finding O2 Credits (1C+1C) Maximum Ma OF THE CO	Basic Skill En As completion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Lab arks: 50 DURSE	Electrical Skill hancement Course per Program course, student is exp faccuracy in measuri cruments. mple domestic applia Hours for Theoret poratory or Field I	pected to enhaning physical quantes tical Learninearning/ Tra	antities. $g &=$
rse Title rse Type requisite (if rse Learnin comes (CLC dit Value al Marks - B: CON Theory - 1	g (6)	electrical skill the Understandi Understandi Using basic Using various Fault finding OZ Credits (1C+1C) Maximum Ma OF THE CO	Basic Skill En As completion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Lab arks: 50 DURSE	Electrical Skill hancement Course per Program course, student is exp faccuracy in measuri cruments. mple domestic applia Hours for Theoret poratory or Field I	pected to enhaning physical quantes tical Learninearning/ Tra	antities. $g &=$
rse Type requisite (if rse Learnin comes (CLC dit Value al Marks - B: CON	g (6)	electrical skill the Understandi Understandi Using basic Using various Fault finding OZ Credits (1C+1C) Maximum Ma OF THE CO	Skill En As completion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Laborates: 50 DURSE	hancement Course per Program course, student is exp faccuracy in measuring the course of the course	pected to enhaning physical quantes tical Learninearning/ Tra	antities. $g \& =$
requisite (if requisite (if ree Learnin comes (CLC) dit Value al Marks - B: CON Theory - 19	g (6)	electrical skill the Understandi Understandi Using basic Using various Fault finding OZ Credits (1C+1C) Maximum Ma OF THE CO	As completion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Labarks: 50	per Program course, student is exp faccuracy in measuri cruments. mple domestic applia Hours for Theoret poratory or Field I	pected to enhaning physical quantes tical Learninearning/ Tra	antities. $g &=$
dit Value Al Marks B: CON Theory - 1	g (6)	electrical skill the Understandi Understandi Using basic Using various Fault finding OZ Credits (1C+1C) Maximum Ma OF THE CO	ompletion of the hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Labarks: 50	course, student is expensed in measuring the couracy in measuring the couract in measuring the couract in the couract of the c	ng physical quances tical Learnin earning/ Tra	antities. $g &=$
dit Value al Marks - B: CON Theory - 1	TENT (electrical skill the Understandi Understandi Using basic Using various Fault finding OZ Credits (1C+1C) Maximum Ma OF THE CO	hrough: ing importance of mechanical tools us measuring inst g and repairing si 1 Credit= 15 30 Hours Lab arks: 50 DURSE	f accuracy in measuri in truments. mple domestic applia Hours for Theoret poratory or Field I	ng physical quances tical Learnin earning/ Tra	antities. $g &=$
al Marks - B: CON Theory - 1	() () TENT (02 Credits (1C+1C) Maximum Ma OF THE CO	1 Credit= 15 30 Hours Lab arks: 50 OURSE	Hours for Theoret poratory or Field I	tical Learnin earning/ Tra	g & = ining
al Marks - B: CON Theory - 1	TENT ((1C+1C) Maximum Ma OF THE CO	30 Hours Lab arks: 50 OURSE	poratory or Field I	earning/ Tra	ining
- B: CON Theory - 1	TENT (Maximum Ma OF THE CO	arks: 50 OURSE	Minimum Pass	Marks: 20	
- B: CON Theory - 1	TENT (OF THE CO	OURSE			
Theory – 1		Total No.				
Monsurar		to the life				
used phy Voltage, F D.C. Circ applicatio A.C. Cir- instantane Heating & applicatio Working: Inverters.	sical quar Resistance, euit: Ohms n, Primary cuits: Gen ous & RM & Lighting ns, idea of : Working Mixer, Ele	a about accuracy ntities (Length, capacitance, ind s law, Series and e and secondary of neration of AC IS values, idea a g effects of curr commonly used g principle of actric heater etc	Mass, Density, ductance, frequent department of the cells, maintenance voltage, wave shout R, L, C circularent: Joule's law of lighting bulb, tub Domestic appliant	measuring devices for the property of the prop	eak, average, d its domestic fan, Cooler,	Period
Safety me	asuremen	nts- Safety meas	appliances	ing with mechanical	and electrical	
Laborato (i) (ii) (iii) (iv) (v)	ry Work: Use of b and elect Use of V Use of M Design & Fan repa Mixer re Electric l	basic tools: Screetric drill, Solder Voltmeter, Curre Multimeter, CRC & Construction of airing and its stuepairing and its kettle repairing press repairing	ewdriver, Pliers, Ving iron etc. ent meter, electron of extension board dy study and its study and its study	ic balance.	oanner, Hand	30
	(ii) (iii) (iv) (v) (vi) (vii)	and elec (ii) Use of N (iii) Use of N (iv) Design of N (v) Fan repa (vi) Mixer re (vii) Electric (viii) Electric (ix) Cooler re	and electric drill, Solder (ii) Use of Voltmeter, Curre (iii) Use of Multimeter, CRC (iv) Design & Construction (v) Fan repairing and its stu (vi) Mixer repairing and its stu (vii) Electric kettle repairing (viii) Electric press repairing (ix) Cooler repairing and its (x) Geezer repairing and its	and electric drill, Soldering iron etc. (ii) Use of Voltmeter, Current meter, electron (iii) Use of Multimeter, CRO. (iv) Design & Construction of extension board (v) Fan repairing and its study (vi) Mixer repairing and its study (vii) Electric kettle repairing and its study (viii) Electric press repairing and its study (ix) Cooler repairing and its study (x) Geezer repairing and its study	and electric drill, Soldering iron etc. (ii) Use of Voltmeter, Current meter, electronic balance. (iii) Use of Multimeter, CRO. (iv) Design & Construction of extension board (v) Fan repairing and its study (vi) Mixer repairing and its study (vii) Electric kettle repairing and its study (viii) Electric press repairing and its study (ix) Cooler repairing and its study	and electric drill, Soldering iron etc. (ii) Use of Voltmeter, Current meter, electronic balance. (iii) Use of Multimeter, CRO. (iv) Design & Construction of extension board (v) Fan repairing and its study (vi) Mixer repairing and its study (vii) Electric kettle repairing and its study (viii) Electric press repairing and its study (ix) Cooler repairing and its study (x) Geezer repairing and its study

Signature of Convener & Members (CBQS):

Chairman

of Studies Theed Nandkumar Patel Vidyalaya, Raigarh (C.G.)

Shaheed Nandkumar Patel Shwavidyalaya, Raigarh (C.G.)

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
- 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

35 Marks End Semester Exam (ESE):

Internal Test / Quiz-(2): 10 & 10 Continuous Internal Assignment/Seminar + Attendance -Assessment (CIA): (By Course Coordinator)

/ Quiz + marks obtained in Assignment shall be considered Total Marks-15 against 15 Marks

End Semester Examination (ESE)

Laboratory /Skill Performance: On spot Assessment A. Performed the Task based on learned skill - 20 Marks

10 Marks B. Spotting based on tools (written)

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

Evaluation by Coordinator

Better marks out of the two Test

Signature of Convener & Members (CBoS):

ed Nandkumar Patel widyalaya, Raigarh (C.G.)

Officer-In-Charge (Apartle Mile) Shaheed Nandkumar Patel /ishwavidyalaya, Raigarh (C.G.)

शहीद नंदकुमार पटेल विश्वविद्यालय, रायगढ़ (छ.ग.)

(छत्तीसगढ़ विश्वविद्यालय अधिनियम 1973 द्वारा स्थापित राजकीय विश्वविद्यालय)



राष्ट्रीय शिक्षा नीति – 2020 के तहत तृतीय एवं चतुर्थ सेमेस्टर नवीन पाठ्यक्रम (सत्र 2025–26)



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

SESSION - 2024 - 25

		SESSIC	ON - 2024 - 25	DCF	- 01 to 02
nc.	C- 01 to 08	DS	SE- 01 to 12		Course Title
Salar Salar		Code	Course Title	Code	Mechanics
Code	Course Title	Code	Introduction to Statistical	PHGE- 01 T	Lab Course
PHSC- 01 T	Mechanics	PHSE- 01	Mechanics	PHGE-01 P	
PHSC- 01P	Lab Course	V v ar aba	As Go Towns	PHGE- 02 T	Electricity & Magnetism
PHSC- 02 T	Electricity & Magnetism	PHSE- 02	Mathematical Physics-I	PHGE- 02 P	Lab Course
HSC- 02 P	Lab Course		- a/kts	(Parlinar)	
PHSC- 03 T	Heat & Thermodynamics	PHSE- 03	Nuclear Physics		
PHSC-03 P	Lab Course		Numerical Methods &C		
PHSC-04T	Waves & Optics	PHSE- 04 T	Programming	VAC	
PHSC-04P	Lab Course	PHSE- 04 P	Lab Course	The standings with a	Renewable
PHSC- 05 T	Introduction to Quantum Mechanics	PHSE- 05	SE- 05 Mathematical Physics-II	PHVAC- 01	Energy and Energy Harvesting
PHSC- 05 P	Lab Course	111555	• •	No. 17. 1	Harvesting
"HSC- 06 T	Solid State Physics & Solid State Devices	PHSE- 06	Classical Electrodynamics & Electromagnetic theory		SEC
PHSC- 06 P	HSC-06P Lah Course		Company of the Compan	J. J	
		PHSE- 07 T		4	
PHSC-07	Classical Mechanics	PHSE- 07 P		PHSEC- 01	BasicElectrical
	Quantum Mechanics	PHSE- 08 T	Its Applications	THODE	Skill
PHSC- 08	Quantum vicenames	PHSE- 08 P			
		PHSE- 09 T			
3		PHSE- 09 P	Lab Course		
		PHSE- 10	Atomic and Molecular Physics		
1		PHSE- 11	Statistical Mechanics	- DAY 3	
=		PHSE- 12 T	Microprocessor		
		PHSE- 12 H		is the Pote	

Signature of Convener & Members (CBoS):

eed Nandkumar Patel vavidyalaya, Raigarh (C.G.)

Officer-la-Charge (Audemic)
Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G.) 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
- 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.

Duret w 15/6/14 Signature of Convener & Members (CBoS):

andkumar Patel avidyalaya, Raigarh (C.G.)

Officer-In-Charge (Academic) Shaheed Nandkumar Patel vishwavidyalaya, Raigarh (C.G.)

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

Program: Bachelor in Science (Diploma/ Degree/ Honors) PHSC-03T Course Code Course Title Piscipline Specific Course	5	Semester: III Session: 2024-25	OCTION	– A: INTRODU	RT.	A
Course Title		Semester. III	in Science	gram: Bachelor in	Pro	
Course Type	6.	PHSC-03T	/ Honors)			
Course Type	Park Service		E 0 Mg 1 1 10 1 10 1			1
As per Program	15	Heat and Thermodynamic		ourse Title	Co	2
After going through the course, the student should be able to: Course Learning Outcomes (CLO)	-	Discipline Specific Course	April 10 m and 10 m a	ourse Type	C	3
After going through the course, the student structure of the fundamental princip thermodynamics, including concepts such as energy, entropy and is thermodynamics. Demonstrate a deep comprehension of the fundamental princip thermodynamics, including concepts such as energy, entropy and is thermodynamics. Apply the laws of thermodynamics to analyze and solve problems with energy transfer, heat engines, refrigeration system and thermodynamic processes. Description of the course of kinetic theory and transport phenomenon in the modynamic processes. Description of the course of kinetic theory and transport phenomenon in the modynamic processes. Description of the course		As per riogiam		re-requisite (if	Pr	4
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of Wien's distribution law and Rayleight Jeans Law Home Transcription of Planck's radiation law. Verification of Planck's radiation law. Zeroth and First Law of Thermodynamics, Second Law of Thermodynamic Thermodynamic Potentials, Maxwell's Thermodynamic RelationsKinetic Theory Distribution of Velocities, Molecular Collisions, Real Gases, Laws of radiation						
Verification of Planck's radiation law. Keywords: Zeroth and First Law of Thermodynamics, Second Law of Thermodynamic Thermodynamic Potentials, Maxwell's Thermodynamic RelationsKinetic Theory Distribution of Velocities, Molecular Collisions, Real Gases, Laws of radiation		d Rayleigh- Jeans Law Nom .	tribution law and	of Wien's distrib		1
Thermodynamic Potentials, Maxwell's Thermodynamic Relations Electronic Potentials Electroni	es,Ent	law.	Planck's radiation l	verification of Plan		
Distribution of Velocities, Molecular Collisions, Real Gases, Laws of Identifications	of C	w of Thermodynamics, Second Bay of Theory	oth and First La	words: Zeroth	Kevr	1
Distribution of Velocities, Molecular Collisions, Real Gases, Laws of Identifications		antiale Maywell's Thermodyllamic Relationstellions	1 Doto		,	
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and the second of the second o					un,	1

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,
- 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)

- 1. 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 <u>https://www.youtube.com/watch?v=F_flGosPY80</u>
- 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%2 0of%20the%20Rgveda%20-%20Shubash%20Kak.pdf

PART - D; Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA): 30 Marks

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

Name and Signature of Convener & Members of CBoS:

Miss

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

7]	RT –	A: INTRODUC	Tion	Semester: III	Session: 2024-2	5		
	Prog	ram:Bachelor in S	Science					
3	(Di	ploma/ Degree/ Ho	onors)	PHSC- 03	P	P AF 1		
		se Code		Heat and Thermo	dynamics	4917, 311		
	Cour	se Title		Discipline Core	Course	Anthorn in		
	Cour	se Type		Duran	wo m			
	Pre-1	requisite (if any)			maggire galloes, calul	imeters,		
5 Course Learning Outcomes (CLO)			heat Han tran Date anal Prec exp	transfer apparatus, experiments. In Analysis: Experimental systems. Idictive Skills: Thermodynamerimentation. In Analysis: Thermodynamerimentation. In Analysis: Thermodynamerimentation. In Analysis: Thermodynamerimentation.	data, theoretical discrenic behavior, varying co	y, phase pancies, nditions,		
	1		01 Credit	1 4 C 324 - 311 HOURS LADY	01 200- 5			
6	-	edit Value	01 Credit	Marks: 50 Minimum	Pass Marks: 20	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
7 Total Marks Waxing COLDSE								
P	ART	- B: CONTEN	TOFTHE	COURSE	n Periods (30 Hours)			
_		TotalNo.of le	earning-Traini	ng/performance Periods -3	(vneriments)	No. of		
-	Sr.	Objects	(At least 10 o	f the following or related E	xpermanny	Period		
	No.				material by I ce's disc			
- 1		To determine the	hermal condu	ctivity of a non-conducting	material by Boo	30		
	1	method.		turn innotions O	f a thermocouple with	21.		
1 1	2	To study the varia	tion of thermo	emf across two junctions o		Ar as		
	2	method. To study the variation of thermo emf across two junctions of a thermocouple with temperature.						
-	3	To verify Newton's law of cooling. To determine the temperature co-efficient of resistance by Platinum resistance						
	4	To determine the	temperature c	0-efficient of regions	the property of the same			
		thermometer.		thornal conductivity(k) of a	a rubber tube.			
	5	To determine the	COEfficient of	an electric kettle with varying the heat at constant pressure	ng voltage.	4 / W		
y 1	6	To study the heat	efficiency of	an electric kettle with vary in fic heat at constant pressure	and constant volume			
7 To determine the			Cloment and	Desorme's method.				
	1	$(\gamma = Cp/Cv)$ of air	coefficient of	thermal conductivity of cop	oper by Searle's	1. A. S.		
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1		Apparatus.	etion of therm	nos-Emf of thermos couple v	with Difference of			
	9	To study the vari	e Two Junction	ons.		VIII		
		Temperature of t	chanical Equ	ivalent of Heat, J, by Callen	der and Barne's			
	1	Temperature of its Two Junctions. 10 To determine Mechanical Equivalent of Heat, J, by Callender and Barne's						
	10		constant flow method. 1 Measurement of Planck's constant using black body radiation.					
1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Planck's cons	stant using black body radia	The second secon			
	11	constant flow me	Planck's cons	stant using black body radiant.		Comperat		
	11 12	Measurement of To determine Sto	Planck's cons fan's Constar	11.	law of cooling.	Temperat		
	11	Measurement of To determine Sto	Planck's cons fan's Constar	stant using black body radiant. Thermocouple, Newton's Heat efficiency, Specific h	law of cooling.	 Femperat quivalen		

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
- 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
- 4. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal, 1985, Vani
- 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

- 1. Thermal Physics and Statistical Mechanics: Laboratory Collectionhttps://egyankosh.ac.in/handle/123456789/67450
- 2. 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/
- 6. https://sites.google.com/view/vlab-bnmitmech/home/heat-transfer-lab https://www.pbslearningmedia.org/resource/lsps07-sci-phys-thermalenergy/thermal-energytransfer/#.WdJiOJlrLIU

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks: 50 Marks

Continuous Internal Assessment(CIA):15 Marks

Continuous Internal Ass EndSemester Exam(ESE): Continuous InternalAssessment(CIA):	35 Marks Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance -05 Total Marks - 15	/ Quiz +Marl Assignment s against 15 M	hall be considered arks
(By Course Teacher) End Semester Exam (ESE):	Laboratory Performance: On spot Assessment Performed the Task based on lab. work Spotting based on tools & technology (writte Viva-voce (based on principle/technology)	nt - 20 Marks	Managed by Course teacher as per lab. status
	Viva-voce (based on principle) commence;	16	10

Name and Signature of Convener & Members of CBoS:

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

$\frac{RJ}{r}$	Γ – A: INTRODUCTI rogram: Bachelor in Scic	ence Semester: IV	Session: 2024-25	
P	(Diploma/ Degree/ Honor	re)		
_		PHS	C-04T	
	Course Code	Waves a	and Optics	
	Course Title	Discipline S	pecific Course	
	Course Type Pre-requisite (if any)	Ae ner	Program	
6 7	Credit Value Total Marks RT - B: CONTENT	and predict how factors such affect wave propagation. Demonstrate an understanding constructive and destructive into solve problems involving wave. Explain the concept of diffire propagation, including how wout after passing through narrow out after passing through narrow elliptical polarization, and appear manipulate electromagnetic warming and appear of the polarization. The control of the polarization of the polariza	as density, elasticity, and temperate of interference phenomena, include terference, and apply this knowledge superposition. Faction and its implications for weaves bend around obstacles and sprew openings. Waves, including linear, circular, ply polarization concepts to analyze aves. S - Learning & Observation Minimum Pass Marks: 40	ing to to eave read
PA	RT - B: CONTENT	OF THE Coords (01 Hr. per perio	od) - 45 Periods (45 Hours)	
	TotalNo.of Teachi	of THE COURSE ng-learning Periods (01 Hr. per periods (Course contents)	N	0. 01
Un	24	Topics (Course serve	P	erio
		Raman: Brief biography of C. V. Ramar	n with his contribution in field of	11
I	waves in Medium: Sp in a fluid, Energy densi and relationship betwee	eed of transverse waves on uniform stri ty and energy transmission in waves. G n them.	pedance of a medium, percentage	
				12
I	Young's Double Slit treatment. Interference inclination (Haidinger measurement of wavele	experiment. Fresnel's Biprism, Phase in Thin Films: parallel and wedge-fringes); Fringes of equal thickness (Fength and refractive index.	-shaped films. Fringes of equal rizeau Fringes). Newton's Rings, ation of wavelength, Wavelength	
	difference. Diffraction: Fresnel D	Diffraction; Half-period zones. Zone plands a wire using half-period zone analysis.	te. Fresnel Diffraction; pattern of a Fraunhofer diffraction; Single slit,	11
I		IIIS & Flanc Dimension	taking Electromagnetic theory or	1
I	I public dit Multiple S	ad light and its maintained represent	1 Di notordation piates. Cilculai i	*
, ,	Double slit. Multiple s V Polarization: Polarize double refraction, Nice	tion Polarization by double refraction	and Huygens's theory, Rotation of	Fre
] 	Double slit. Multiple s V Polarization: Polarize double refraction, Nice and elliptical polariza plane of polarization,	tion. Polarization by double refraction Biquartz polarimeter. and transverse waves, principle of Fraunhofer diffraction, Polarization	and Huygens's theory, Rotation of	Fre

PART - C: LEARNING RESOURCES

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)

- 1. 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

Continuous Internal	Assessment (Caray	Better marks out of the two Test / Quiz
End Semester Exam	1 Internal 1681/ Ulita (4)	I Accionment Shan
Continuous Interna	20 20 Assignment/ Seminar (1): 10	be considered against 30 Marks
Assessment (CIA): (By course teacher)	Total Marks: 30	be considered by
End Semester Examination (ESE)	Two section - A & B	Mark; Q2. Short answer type- 5x4 =20Marks at of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

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

DT -	A: INTRODUC	CTION	***	Session: 2024-25	
Drog	ram:Bachelor in	Science	Semester: IV	Control of the second	3A.7.
Trog	ploma/ Degree/ H	onors)	PHSC-	04P	1
Cours	se Code	and the second of the	PHSC-	Ontics	, that 's
	se Title	S grade gag	Waves and	ific Course	J
	se Type		Discipline Spec	ogram	
Cour	equisite (if any)		As per pro	ogram	erstand
6 Cr	edit Value otal Marks C - B: CONTEN	laws and prito wave naturally Gain program source demonstrum program p	re of light. The students were strating competence in strating competence in strating competence in strating accurately a deep understanding ion, diffraction, dispersion, dispersion ations in various scientificate recorded data and form 1 Credit = 30 Hours Marks: 50 Minimum COURSE	Laser, spectrometers, point setting up experiments, call rate data. In of optical principles of the principles of a set of the principles	as light imeter, ibrating such as as their
17111	TotalNo.of	learning-Train	ing/performance Periods	d Experiments)	No. of
Sr.	Objects	s (At least 10 c	of the following or relate	u Enpera	Period
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1	To determine the	Frequency of A	AC mains with the help of		30
2	Determination of	angle of prism	using spectrometer. ex of the Material of a giv	en Prism using	No. 11
3	the state	Retractive mu	CV 07 1110 1111	Constrometer	
	Spectrometer.	nersive Power	of the Material of a given	Prism using Spectrometer of a prism.	
4	to I to main a the	value of Cauci	lly Collstants of the	of a prism.	1000
5,					+ 1 - 1
6	To determine wa	velength of soc	dium light using Fresnel E	Biprism.	<u> </u>
7	To determine wa	velength of so	dium light using Newton's	s Rings Method.	
8	To determine the	velength of Sc	dium light by laser diffra	ction.	
9	To determine Wa	., 0.01.6	and light	ising plane diffraction	
9	To determine wa	velength of sp	ectrum of Mercury fight t	ising president	
9	To determine wa	avelength of sp	ectrum of wicroary man		T 1. 67
9 10 11	To determine was	etrometer.	C - Plane Diffraction	n Grating.	e
9 10 11	To determine was Grating and Spe To determine the	e thickness of a	ower of a Plane Diffraction a thin paper by measuring	n Grating.	e
9 10 11	To determine was Grating and Specific To determine the To determine the Specific To determine th	e Resolving Poet thickness of a by a wedge-s	ower of a Plane Diffraction a thin paper by measuring chaped Film.		e
9 10 11 12 13	To determine was Grating and Specific To determine the fringes produced Determination of	exelength of spoots of the content o	ower of a Plane Diffraction a thin paper by measuring chaped Film. wer telescope.	n Grating. the width of the interference	
9 10 11	To determine was Grating and Specific To determine the fringes produced Determination of	exelength of spoots of the content o	ower of a Plane Diffraction a thin paper by measuring chaped Film. wer telescope.	n Grating. the width of the interference	
9 10 11 12 13 14 15	To determine was Grating and Specific To determine the fringes produced Determination of Study of polariz	e Resolving Poet thickness of a wedge-sof resolving poet to a control of sugar	ower of a Plane Diffraction a thin paper by measuring chaped Film. wer telescope.	n Grating. the width of the interference	

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PART - C: LEARNING RESOURCES

Text Books, Reference Books and Others

J

- 1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing Text Books Recommended
 - 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
 - 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)

- 1. Link for e-Books for Physics: Physics Practical: https://egyankosh.ac.in/handle/123456789/82374; https://www.lightandmatter.com/lab_223.pdf;
- 2. 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-l
- 5. https://phet.colorado.edu/en/simulations/wave-interference
- 6. https://egyankosh.ac.in/handle/123456789/82374

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

50 Marks Maximum Marks:

Continuous Internal Assessment(CIA):15 Marks

InternalAssessment(Internal Test / Quiz-(2): 10 & 10	Quiz +Marks 0	all be considered
CIA): (By Course Teacher)	Laboratory Performance: On spot Assessme		Managed by
End Semester Exam (ESE):	Performed the Task based of Task Work	n) – 10 Marks	Course teacher as per lab. status
Exam (L32).	Viva-voce (based on principle/technology)	1 0 10	SUPP

Name and Signature of Convener & Members of CBoS:

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

Pro	ogram : Bachelor in (Diploma / Degree/)	Science	Semester - III	Session: 2024-2025
1	Course Code	Attended To	PHSE-0	
2			Introduction to Statist	tical Mechanics
	Course Title		Discipline Specifi	c Elective
3	Course Type		A on Prog	ram
5	Pre-requisite (if, any) Course Learning. Outcomes(CLO)	numbers > Comprehence physical phee > Correlate are laws. > Apply concessions.	d the concept of ensembenomenon and compare the classical cepts of statistical distri	nd microstate and calculate the les and its requirement in study of and quantum statistical distribution bution laws for different physical distribution.
6	Credit Value	4 Credits	Credit = 13 Hou	Min Passing Marks: 40
7	Total Marks	Max. Marks:	100	Will Passing Watter.

PART -B: CONTENT OF THE COURSE

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

XI. :4	Topics (Course Contents)	No. of Period
Unit I	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
II	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 number of accessible microstates for free particle in 1D, free particle in 3D.	15

lolbly

III	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 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	15
IV	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) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) 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	15
Keyword	of Metals (Density of Orbitals). Macrostate & Microstate, ensemble, distribution laws, Bose-Einstein Statistics, Ferrostatistics	mi-Dir

Name and Signature of Convener & Members of CBoS:

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PART-C:LEARNING RESOURCES

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), https://archive.nptel.ac.in/courses/115/103/115103113/,
- 3. https://onlinecourses.nptel.ac.in/noc19_ph10/preview,
- 4. https://archive.nptel.ac.in/courses/115/106/115106126/
- Uttar Pradesh Higher Education Digital Library, http://heecontent.upsdc.gov.in/SearchContent.aspx
- Swayam Prabha DTH Channel,

https://www.swayamprabha.gov.in/index.php/program/current he/8

PART-D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods: 100 Marks Maximum Marks: Continuous Internal Assessment(CIA): 30 Marks

70 Marks End Semester Exam (ESE):

Assessment(CIA):	Internal Test / Quiz-(2): 20 & 20 Assignment/Seminar- Total Marks - 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
(By Course Teacher)	CODE TO THE RES	Mark; Q2. Short answer type- 5x4 =20Marks

(ESE):

Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 =20Marks Section B: Descriptive answer type qts.,lout 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		
Program:Bachelor in Science (Diploma/Degree/Honors)		Semester - IV	Session: 2024-2025	
1	Course Code		PHSE-0	
2	Course Title	ar war di da	Discipline Specific	
4	Course Type Pre-requisite (if, any)		As per Progr	am
5	Course Learning Outcomes(CLO)	probability and solving them Apply and spherical and Use Dirac D quantum med	nd probability distribution ficiency in writing and for a given physical systematic interpret the curvilineal cylindrical symmetries. Delta function for various changes approaches.	Solving Differential
6	Credit Value	4 Credits	$\frac{Credit = 15 Hour}{100}$	Min Passing Marks: 40
7	Total Marks	Max. Marks:	100	American Manager Market Company

PART -B: CONTENT OF THE COURSE

r výta hy	Total No. of Teaching-learning Periods (01 Hr. per period) - 60 Periods (60 Hou	
Unit	Topics (Course Contents)	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	16
II	Inventor of Calculus: some examples on calculus 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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Ш	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.	15
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	13
Keywords	Calculus Lagrange Multipliers Homogeneous Equations, Particular Integral, 11	

Signature of Convener & Members (CBoS):

PART-C: LEARNING RESOURCES

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., Elsevier.
- 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

- 1. 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
- 5. 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

	PART-D: ASSESS	SMENI AND EVALUATION			
-	Suggested Continuous I Maximum Marks:	100 Marks			
	Continuous Internal As	30331110111 (0222)	그게 이 중화를 무려면 되는데요. 네 모양 바다 보였다.		
	End Semester Exam (E	Internal Test / Quiz-(2): 20 & 20	Better marks out of the two Test / Quiz		
1		Assignment/Seminar- 10	+ obtained marks in Assignment shall be		
	Assessment(CIA).	Total Marks - 30	considered against 30 Marks		
	(By Course Teacher)	Two section - A & B	The specific review of the Control o		
Section A: O1 Objective - 10 x1= 10 Mark; O2. Short answer type-					
4	Exam (ESE):	Section B: Descriptive answer type qts.	.,1 out of 2 from each unit-4x10=40Marks		

Name and Signature of Convener & Members of CBoS:

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

1	ART -	A: INTROI	DUCTION		17 8 7		
	(Cei	Program: Back tificate/ Diplor	helor in Science na/ Degree/ Honors)	Semester: I/ III/ V	Session	: 2024-2	
1	Course	Code	Bor Long Clairing	PHVAC-01			
2	Course '	Title	Renewable Energy and Energy Harvesting				
3	Course '	Туре	Value Addition Course				
1	Pre-requisite (if any)		As per Program				
5	1	Learning es (CLO)	Objective of the course is to impart students; the knowledge of renewable energy and they are expected to learn about: > Energy crisis at national and international scenario. > Renewable sources of energy and their importance. > Availability of renewable energy resources in India. > Knowledge about energy harvesting technology.				
6	Credit \	/alue	02 Credits 1 Cre	dit = 15 Hours- Learning &			
7	Total M	arks	Maximum Marks: 50	Minimum P	ass Mark	s: 20	
	nn I	Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear				07	
等 持	Unit		Тор			No. o Perio	
		energy, their limitation, need of renewable energy, non-conventional energy sources. Limitations of non-conventional energy resources. Environmental aspect of energy, World energy status, Energy scenario in India. Geo thermal Energy: Geothermal Resources, Geo thermal Technologies.					
不可以 以 一种 一种 一种	II	Solar energy pond, non-con solar water h green houses, of photovoltai Hydro Ener	olar energy: Solar energy, its importance, storage of solar energy, solar ond, non-convective solar pond, applications of solar pond and solar energy, olar water heater, flat plate collector, solar distillation, solar cooker, solar een houses, solar cell, absorption air conditioning. Need and characteristics photovoltaic (PV) systems, sun tracking systems. Sydro Energy: Hydro power resources, hydro power technologies, avironmental impact of hydro power sources.				
	III	Biomass ener generation, fac diagram), bio Biodiesel prod Ocean Energ	s energy: Biomass resources, Biomass conversion technology, biogas on, factors affecting bio-digestion, working of biogas plant (with block), biogas from plant waste, biomass energy programme in India, el production from non-edible oil seeds. Energy: Ocean Energy Potential against Wind and Solar, Wave ristics and Statistics Wave Energy Devices.			08	
	Characteristics and Statistics, Wave Energy Devices. Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines grid interconnection topologies. Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect, piezoelectric materials, Piezoelectric Energy harvesting applications.			ologies. istics of	07		

Energy Harvesting, Piezoelectric Energy harvesting

Signature of Convener & Members (CBoS):

applications.

Keywords;

of Studies Swartlandkumar Patel Vidyalaya, Raigarh (C.G

Officer-In-Charge Academic Shaheed Nandkumar Patel Shaheed Nandkumar Patel Shaheed Nandkumar (C. 1987)

Fossil fuel, Renewable energy sources, Solar energy, Biomass energy, Electromagnetic

10 mg (0 m)

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
- 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.
- 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

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 Maximum Marks: Continuous Internal End Semester Exam	us Evaluation Methods: 50 Marks Assessment (CIA): 15 Marks (ESE): 35 Marks	
7	Continuous Internal Assessment (CIA): (By course teacher)	Internal Test/ Quiz- (2): 10 + 10 Assignment/ Seminar+ Attendance- 05 Total Marks- 15	Better marks out of the two Test / Quiz marks obtained in Assignment shall be considered against 15 Marks.
	End Semester Examination (ESE):	Two section – A & B Section A: Q1. Objective – 05 x1= 05 Mark Section B: Descriptive answer type qts.,1 o	

Signature of Convener & Members (CBoS):

Chairman

of Studies

eed Nandkumar Patel idyalaya, Raigarh (C.G

Officer-In-Charge (Acadamic) Shaheed Nandkumar Patel Vishwavidyalaya, Raigarh (C.G

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

. A T)T	1 TAITED			SE CURRIC	ULUM		
AF			ODUCTIO		1 0	er: II/ IV/V/ VI	Session: 2	024-25
Program: Bachelor (Certificate/ Diploma/ D						er: 11/ 1 v/ v/ v 1	Session. 2	
			ma/ Degree/	Honors)		Priorio Al		
1		e Code			, <u> </u>	PHSEC- 01		
2.	Cours	e Title			Basic I	Electrical Skill		
3	Cours	е Туре			Skill Enl	hancement Cours	e	
4	Pre-re	quisite (if	any)	As per Program				
5	Course Learning		On suc	cessful co	ompletion of the c	course, student is ex	pected to enhar	ice nis
_		_	electric	On successful completion of the course, student is expected to enhance his electrical skill through:				
	Outcomes (CLO)		′ > Un	Understanding importance of accuracy in measuring physical quantity				
			I ▶ Us	ing basic	mechanical tools.			
			> Us	ing variou	is measuring instr	nple domestic appli	ances	
			> Fai	ult finding				g & =
6	Credi	t Value	02 Cr		1 Credit= 13 L	oratory or Field	earning/ Tra	ining
			(1C+1	.C)		Minimum Pass	Marks: 20	
7	Total	Marks		num Ma		William 2 400		
PΔ	RT-	B: CON	TENT OF T	HE CC	URSE			
1 71			To	tal No. o	of Teaching–lea	rning Periods:	ı. (30 Hours)	
		Theory - 15	Periods (15 Hrs) and Lab	. or Field learning	/Training 30 Period	15 (30 110 410)	No. of
	Theory = 13 Ferrous (11					tal		Period
Mc	Module Topic (Course Contents) Measurement: Idea about accuracy in measurement, measuring devices for commonly Measurement: Idea about accuracy in measurement, measuring devices for commonly Length, Mass, Density, Temperature, Power, Current,			Topic	(Course Conten	112)		7 61100
			15					
			ent: Idea about	accuracy	in measurement,	measuring devices.	ver, Current,	7
		Voltage, Resistance, capacitation, industrial registance circuit. Kirchhoff's lawe then						
	D.C. Circuit: Ohms law, Selies and parameter			C and ary cells	t. augross	2 L		
		application	, Primary and so	of AC	voltage, wave sl	hape, frequency, p	eak, average,	
	application, Primary and secondary cells, maintenance of secondary cells, application, Primary and secondary cells, maintenance of secondary cells, application, Primary and secondary cells, maintenance of secondary cells. A.C. Circuits: Generation of AC voltage, wave shape, frequency, peak, averance instantaneous & RMS values, idea about R, L, C circiuits instantaneous & RMS values & RM				d its domestic			
		Wasting &	l ighting effect	S Of Carr		OFT LED	a its domestic	0.00
	Heating & Lighting effects of current some states and polications, idea of commonly used lighting bulb, tube, CFL, LED. applications, idea of commonly used lighting bulb, tube, CFL, LED. working: Working principle of Domestic appliances like electric fan, Cooler, Working: Working bester eff.							
		Working:	Working prince	ibic or	Domestic			· 2,14,
		Inverters, N	Aixer, Electric he	eater etc	rements in worki	ng with mechanical	and electrical	, - · ·
1		Safety mea	g and repair of e	lectrical a	ppliances.			30
		Laborator	v Work:			· · · · · · · · · · · · · · · · · · ·	nanner Hand	30
	11	(i)	TI C books to	ols: Screv	wdriver, Pliers, W	rench, Hacksaw, S	patitier, Fland	
		(-)	1 1 1 1 1	II CAIderi	na iron eic.			
		(ii)	Tise of Volumet	er, Currer	il lifeter, ciccironi	C Dalance.		
	l ann Ilmanf		Use of Multime	Multimeter, CRO. 2 Construction of extension board			2	
		(iv)	Fan repairing a	nd its stud	v			
1		(v)	Mixer repairing	and its st	udy			es e
		(vi) (vii)	Electric kettle r	epairing a	nd its study			
	1,000	(viii)	Electric press re	epairing a	nd its study		4	-4.
				1.14.5				
1		(ix)	Cooler repairing	g and its s	tudy			
	a la	(ix) (x)	Geezer repairing Invertor repairing	g and its s	tudy tudy		- 15 W	

Signature of Convener & Members (CBဝှร) :

Chairman

of Studies heed Nandkumar Patel vidyalaya, Raigarh (C.G.

Milicer-In-Charge (Againma)
Shaheed Nandkumar Patel
Shawavidyalaya, Raigarh (C.G.)

TAKI – C: LEAKINING KESUUKCES

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
- 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 Assessment (CIA):

Internal Test / Quiz-(2): 10 & 10 Assignment/Seminar + Attendance - 05

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

(By Course Coordinator)

Total Marks-

Assignment shall be considered

against 15 Marks

End Semester Examination

Laboratory /Skill Performance: On spot Assessment

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

15

Evaluation by Coordinator

(ESE)

B. Spotting based on tools (written)

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

Signature of Convener & Members (CBoS):

ed Nandkumar Patel widyalaya, Raigarh (C.G.)

> Officer-In-Charge (Ad 142,000) Shaheed Nandkumar Patel fishwavidyalaya, Raigarh (C.G.)

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