

GOVT. DIGVIJAY AUTO. PG COLLEGE RAJNANDGAON (CHHATTISHGARH)

SYLLABUS AND MARKING SCHEME FOR B.Sc. WITH PHYSICS SESSION 2025-26 SEMESTER - I

• THEORY PAPER:

Class	Paper	Course title	Course code	Credit value	Theory marks	Internal marks	Passing marks
SemI	DSC	MECHANICS	PHSC-01T	3	70	30	40
SemI	GE	MECHANICS	PHGE-01T	3	70	30	40

• PRACTICAL/PROJECT PAPER:

Class	Paper	Course title	Course code	Credit value	Practical + viva marks+ Sessional	Internal assessment :	Passing marks
SemI	DSC	MECHANICS	PHSC-01P	1	35	15	20
SemI	GE	MECHANICS	PHGE-01P	1	35	15	20

GOVT. MGVIJAY COLLEGE RAJNANDGAON (C.G.)

(An Autonomous College Affiliatted With Hemchand Yadav Vishwavidyalaya, Durg)

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

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		COURSE C	CURRICUL	UM				
PAF	RT – A: INTRODUCT	ION						
	Program: Bachelor i ertificate/ Diploma/ Do	in Science	Sen	nester: I	Session: 2024	1-25		
1	Course Code		,	PHGE-01 T				
2	Course Title			Mechanics				
3	Course Type		Gene	ric Elective C	ourse			
4	Pre-requisite (if any)		As per Program					
5	Course Learning Outcomes (CLO)	 Analyze and Explain and energy in collision of Evaluate and analy Analyze flow Describe specific and specific specific specific and analy 	I apply the laws I demonstrate the Including their wand energy tran Ind calculate move how these properties.	ne principle of co application in sformation, ment of inertia j operties affect to ic effects and to	uld be able to: rious dynamical situat onservation of moment real-world scenario : for objects of different he motion of rotating b	tum and such as shapes odies.		
6	Credit Value				ning & Observation			
7	Total Marks	Maximum Ma			Pass Marks: 40	ı		
_	T – B: CONTENT OF TH		arks. 100	Minimum	r ass Marks: 40			
- / 110			d- /04 II	. 1)				
	Total No. of Teaching	g-learning Perio	as (U1 Hr. per	period) - 45 Pe	eriods (45 Hours)			
Unit		Topics (C	Course content	rs)		No. of		
1	Historical Background: Co	ntribution of Arv	abhatta and Var	ahmihir to scier	ace and society. Drief	Periods 12		
11	Scalar & Vector products of physical significance. Laws of of particles, Concept of Cento Motion of Rocket. Work an gradient of Potential Energy, Rotational Dynamics: Angu	of Motion: Review or of Mass, Motion of Energy: Work Conservation of G	w of Newton's L n of center of ma Energy theorer energy, Elastic a	taws of motion, lass, Conservation for conservation in-elastic Co	Dynamics of a system of linear momentum, we forces, Force as a			
	Inertia, Theorem of paralli Inertia of discrete and contin Elasticity: Stress & Strain, I various elastic modulii (with Flow of fluids, Coefficient of falling in a viscous fluid, Stol	el and perpendicunuous objects (Re Hooke's law, Elas Hout derivation), Viscosity, Derivat ke's law, Expressi	lar axes (statem ectangular lamir stic constants, P Work done in t tion of Poisculli ion for terminal	ents only), Calc a, disc, solid cy oisson's Ratio, wisting a cylind 's formula, Moti- velocity	ulation of Moment of /linder, solid sphere). Relationship between er. Fluid Dynamics : on of a spherical body	12		
111	Gravitation: Newton's Law a plane, angular momentum only), Satellite in circular ortocillations: Simple harmon Potential Energy, Total Energy	of Gravitation, Mais conserved, are it and application ic motion, Different and their time a	otion of a partice al velocity is constant of the second o	le in a central for constant), Keple ous orbits. of SHM and its s	r's Laws (statements	11		
IV	or damped oscillations and forced oscillations (Conceptual only).							
Keywo	rds: Aryabhatta, Vectors, No	ewton's Laws, Angu	lar Momentum, E	lasticity, Gravitat	ion, Oscillations, Relativi	ty		
Sig.	Hature of Convener & Mem	bers (CBoS):	ey. Sin	Deign /	lfb S. C	<u>y</u>		
Jun	98/0	5/2025 W	Jale!	JU	DV.			

Text Books, Reference Books Recommended and Others

Text Books Recommended-

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

Reference Books Recommended-

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

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

- 1. All e-books of physics https://www.e-booksdirectory.com/listing.php?category=2
- 2. Free physics text book in PDF
- 3. https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Km a0VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE
- 4. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 5. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- 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/cm1

PART - D: ASSESSMENT AND EVALUATION

Suggested	Continuous	Evaluation	Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA):30 Marks End Semester Examination (ESE): 70 Marks

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Continuous Internal	Internal Test/ Quiz (2): 20220	Better marks out of the two Test / Quiz
Assessment (CIA):	Assignment/ Seminar (1):10	+ marks obtained in Assignment shall
(By course teacher)	Total Marks: 30	be considered against 30 Marks

End Semester	Two sec
Exam (ESE):	Section

Two section - A & B

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

Name and Signature of Convener & Members of CBoS:

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m + 16/14

RAJNAND ON (C.G.)
(An Autonomous Coile Je Affiliatted With

Hemchand Yadav Visnwavidyalaya, Durg)

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

Program: Bachelor in Science (Certificate/ Diploma/ Degree/ Honors) Semester: Session: 2024-25		T – A: INTRODI	UCTION								
Course Code	1	Program: Bachelor	in Science	Sem	ester: I	Session: 20	024-25				
Course Title Mechanics	(Cer	tificate/ Diploma/ D	egree/ Honors)			Session. 20	124-23				
Course Title Course Type Generic Elective Course As per Program After the completion of the course, Students are expected to understand working mechanism and laws of classical mechanics. The Students will be able to Assemble required parts/devices and arrange them to perform experiments. Record/ observe data as required by the experimental objectives. Analyze recorded data and formulate it to get desired results. Interpret results and check for attainment of proposed objectives related to laws of mechanics and its applications Credit Value OI Credit Total Marks Maximum Marks: 50 Minimum Pass Marks: 20 PART − B: CONTENT OF THE COURSE Total No. of learning-Training/performance Periods-30 Periods (30 Hours) Sr. Objects (At least 10 of the following or related Experiments) No. of Period Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope. To determine the Moment of Inertia of a Flywheel. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method). To determine Coefficient of Viscosity of water by Capillary Flow Method. To determine the Modulus of Rigidity of a Wire by Maxwell's needle. To determine the value of g using Bar Pendulum. To determine the value of g using Bar Pendulum. To determine the value of g using Kater's Pendulum. Moment of Inertia Tod in irregular body by Inertia Table Moment of Inertia Pendulum. Moment of Inertia Pendulum Personal Inertia Table	1 C	Course Code	,	P	HGE- 01 P						
Course Type Generic Elective Course	2 C	Course Title									
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Interpret results and check for attainment of proposed objectives related to laws of mechanics and its applications 6			Analyze reco	rded data an	d farmantata it	experimental of	ojectives.				
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To determine g and velocity for a freely falling body using Digital Timing Technique. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method). To determine the Young's Modulus of a Wire by Optical Lever Method. To determine the Modulus of Rigidity of a Wire by Maxwell's needle. To determine the elastic constants of a wire by Searle's method To determine the value of g using Bar Pendulum. To determine the value of g using Kater's Pendulum. Study of bending of a beam/ cantilever To determine Moment of Inertia of an irregular body by Inertia Table Moment of Inertia, Pendulum, Vernier Callingts, Serry Gauge, Travelling water to be a constant of the co		10 determine the N	Ioment of Inertia o	f a Flywhee	1.						
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7 To determine the Young's Modulus of a Wire by Optical Lever Method. 8 To determine the Modulus of Rigidity of a Wire by Maxwell's needle. 9 To determine the elastic constants of a wire by Searle's method 10 To determine the value of g using Bar Pendulum. 11 To determine the value of g using Kater's Pendulum. 12 Study of bending of a beam/ cantilever 13 To determine Moment of Inertia of an irregular body by Inertia Table **Converted** Moment of Inertia, Pendulum, Vernier Callingra, Serrey Gauge, Travelling with the control of the control		rechnique.									
7 To determine the Young's Modulus of a Wire by Optical Lever Method. 8 To determine the Modulus of Rigidity of a Wire by Maxwell's needle. 9 To determine the elastic constants of a wire by Searle's method 10 To determine the value of g using Bar Pendulum. 11 To determine the value of g using Kater's Pendulum. 12 Study of bending of a beam/ cantilever 13 To determine Moment of Inertia of an irregular body by Inertia Table **Converted** Moment of Inertia, Pendulum, Vernier Callingra, Serrey Gauge, Travelling with the control of the control	0	(Poisswills's rest	licient of Viscosity	of water by	Capillary Flo	w Method					
8 To determine the Modulus of Rigidity of a Wire by Maxwell's needle. 9 To determine the elastic constants of a wire by Searle's method 10 To determine the value of g using Bar Pendulum. 11 To determine the value of g using Kater's Pendulum. 12 Study of bending of a beam/ cantilever 13 To determine Moment of Inertia of an irregular body by Inertia Table Kenward Moment of Inertia, Pendulum, Vernier Callingra, Serry Gauge, Travelling with the control of	7	(Poiseulle's metho	d).								
To determine the elastic constants of a wire by Nearwell's method To determine the value of g using Bar Pendulum. To determine the value of g using Kater's Pendulum. Study of bending of a beam/ cantilever To determine Moment of Inertia of an irregular body by Inertia Table Moment of Inertia, Pendulum, Vernier Calliners, Serry Gauge, Travelling misses.	,	To determine the Young's Modulus of a Wire by Optical Lever Method.									
10 To determine the value of g using Bar Pendulum. 11 To determine the value of g using Kater's Pendulum. 12 Study of bending of a beam/ cantilever 13 To determine Moment of Inertia of an irregular body by Inertia Table Keyword Moment of Inertia, Pendulum, Vernier Callingra, Serrey Gauge, Travelling and the control of the control		To determine the Modulus of Rigidity of a Wire by Maxwell's needle									
11 To determine the value of g using Kater's Pendulum. 12 Study of bending of a beam/ cantilever 13 To determine Moment of Inertia of an irregular body by Inertia Table Kenward Moment of Inertia, Pendulum, Vernier Calliners, Serry Gauge, Travelling with the control of the co	8	To determine the N	astic constants of a	to determine the elastic constants of a wire by Searle's method							
12 Study of bending of a beam/ cantilever 13 To determine Moment of Inertia of an irregular body by Inertia Table Kenward Moment of Inertia, Pendulum, Vernier Calliners, Serry Gauge, Travelling with the control of	8	To determine the el	astic constants of a	wire by Sea	arle's method	leedle.					
To determine Moment of Inertia of an irregular body by Inertia Table Moment of Inertia, Pendulum, Vernier Calliners, Serry Gauge, Travelling with the control of the contr	8 9 10	To determine the el	astic constants of a alue of g using Bar	wire by Sea Pendulum.	arle's method	leedle.					
Keywards Women of thertia, Pendulum, Vernier Calliners, Screw Gauge, Travelling microscope, 121	8 9 10 11	To determine the value of the v	astic constants of a alue of g using Bar alue of g using Kate	wire by Sea Pendulum. er's Pendulu	arle's method	leedle.					
Coordele Mash of Co. 1 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	8 9 10 11 12	To determine the vice To determine the vice Study of bending of To determine Mom	astic constants of a alue of g using Bar alue of g using Kate f a beam/ cantilevent of lnertia of an	Pendulum. er's Pendulu r irregular bo	um.	Table					
Searle's Method, Stoke's Method, Cappilary Rise Method, Viscosity, Surface Tension	8 9 10 11 12 13	To determine the via To determine the via Study of bending o To determine Mom	astic constants of a alue of g using Bar alue of g using Kate f a beam/ cantilevernent of Inertia of an adulum, Vernier Calling	Pendulum. er's Pendulu r irregular bo	dy by Inertia	Γable	Constant				

Signature of Convener & Members (CBoS):

PART - C: Learning Resources

Text Books, Reference Books and others

Text Books Recommended-

- 1. Advanced Practical Physics for students, B.L.Flint&H.T.Worsnop, 1971, Asia Publishing House.
- 2. Engineering Practical Physics, S.Panigrahi& B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- 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 Marke

Continuous Internal Assessment(CIA):15 Marks

EndSemester Exam(ESE):35 Marks

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

Name and Signature of Convener & Members of CBoS:

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.⊃N (C.G.) RAJNAM (An Autonomous College Affiliatted With Hemchand Yadav Vishwavidyalaya, Durg)

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

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(0)	T – A: INTRODUCTI Program: Bachelor in	n Science	Semester: I	Session: 2024-	25		
(Cer	rtificate/ Diploma/ De Course Code	gree/ Honors)	PHSC-01T				
1			Mechanics				
2		Course Title					
3	Course Type		As per Progr				
4	Pre-requisite (if any)	After going through	the course the student s	hould be able to:			
5	Course Learning Outcomes (CLO)	After going through the course, the student should be able to: > Analyze and apply the laws of motion to various dynamical situations. > Explain and demonstrate the principle of conservation of momentum energy including their application in real-world scenario such collision and energy transformation. > Evaluate and calculate moment of inertia for objects of different sha and analyze how these properties affect the motion of rotating bodies. > Analyze flow of fluids. > Describe special relativistic effects and their effects on the mass					
		> Describe spec	ial relativistic effects an	a their effects on the ma	05 24770		
-	C Value	02 Credits 1 C	noving object.	earning &Observation			
6	Credit Value	Maximum Marl		ım Pass Marks: 40			
7	Total Marks		AS. 100				
PART	Γ – B: CONTENT OF TH	IE COURSE	(5.1) (5.1)	Davieds (AE Hours)			
	TotalNo.of Teaching	g-learning Periods	(01 Hr. per period) - 45	Perious (45 nours)	No.		
Jnit		• `	irse contents)		Perio		
I	biography of Vikram Sarabhai with his contribution. Vectors: Scalar and vector quantities & fields, Scalar & Vector products of two vectors, Derivatives of a vector, Gradient of scalar field and its physical significance. Laws of Motion: Review of Newton's Laws of motion, Dynamics of a system of particles, Concept of Center of Mass, Motion of center of mass, Conservation of linear programmer. Motion of Rocket Work and Energy: Work-Energy theorem for conservative forces,						
	momentum Motion of Roc	ket Work and Ener	, Motion of center of mas gv: Work-Energy theorer	n for conservative forces,			
11	momentum, Motion of Roc Force as a gradient of Poten Rotational Dynamics: Ang of Inertia, Theorem of para Inertia of discrete and e sphere) Elasticity: Stress of between various elastic m Dynamics: Flow of fluids, spherical body falling in a	ket. Work and Energy, Conservential Energy, Conservential Energy, Conservential Energy, Conservential Energy, Continuous objects Strain, Hooke's landulii (without der Coefficient of viscous fluid, Stoke's	, Motion of center of may gy: Work-Energy theorer ation of energy, Elastic au rque, Conservation of angur axes(statements only), ((Rectangular lamina, di av, Elastic constants, Polivation), Work done in sity, Derivation of Poiseu, law, Expression for term	n for conservative forces, and in-elastic Collisions ular momentum, Moment Calculation of Moment of sc, solid cylinder, solid isson's Ratio, Relationship twisting a cylinder. Fluid Ili's formula, Motion of a inal velocity.			
111	momentum, Motion of Roc Force as a gradient of Poten Rotational Dynamics: Ang of Inertia, Theorem of para Inertia of discrete and e sphere) Elasticity: Stress &	ket. Work and Energy, Conserved and perpendicular momentum, To llel and perpendicular continuous objects. Strain, Hooke's land delie (without der Coefficient of viscous fluid, Stoke's woof Gravitation, Motum is conserved, and applications onic motion, Difference Energy and their traitions and forced osci	Motion of center of mas gy: Work-Energy theorer ation of energy, Elastic as rque, Conservation of angur axes(statements only), ((Rectangular lamina, di aw, Elastic constants, Polivation), Work done in sity, Derivation of Poiseus Law, Expression for term otion of a particle in a center ead velocity is constant), I , Geosynchronous orbits. Intial equation of SHM and time averages, Compoun- tillations (Conceptual only	in for conservative forces, and in-elastic Collisions pular momentum, Moment Calculation of Moment of sc, solid cylinder, solid isson's Ratio, Relationship twisting a cylinder. Fluid Illi's formula, Motion of a inal velocity. Intral force field (motion is Kepler's Laws (statements of its solutions, Kinetic and dispendulum, Differential (1).	1		

Text Books, Reference Books Recommended and Others

Text Books Recommended-

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- 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
- https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Km a0VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE
- 4. Cambridge University Books for Physics https://www.cambridgeindia.org/
- 5. Books for solving physics problems https://bookboon.com/en/physics-ebooks
- NPTEL Online courses https://archive.nptel.ac.in/courses/115/106/115106123/;
- BSc Lectures by Prof. H C Verma: https://bsc.hcverma.in/index.php/course/relativity;
 https://bsc.hcverma.in/index.php/course/relativity;

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuo	s Evaluation Method	ds:	
Maximum Marks:		100 Marks	
Continuous Internal	Assessment (CIA):	30 Marks	
End Semester Exam	ination (ESE):	70 Marks	
Continuous Internal	Internal Test/ Quiz	z (2): 20 + 20 Better marks out of the two Test / Q	uiz
Assessment (CIA):	Assignment/ Semir		
(By course teacher)	Total Marks:	30 considered against 30 Marks	
End Semester	Two section - A & B	В	
Exam (ESE): Section A: Q1. Objective – 10		ctive – $10 \text{ x}1 = 10 \text{ Mark}$; Q2. Short answer type- $5x4 = 20 \text{ Mark}$	(S
	Section B: Descriptive	e answer type, 1 out of 2 from each unit-4 x 10=40 Marks	_

Name and Signature of Convener & Members of CBoS:

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RAJNA (C.G.)

(An Autonomous Affiliatted With Vispwayidvalava, Durg)

(An Autonomous Carabaya, Durg) Hemchand Yadav Visnwavidyalaya, Durg) FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS COURSE CURRICULUM

PA	RT – A: INTROD	UCTION						
	Program:Bachelor	in Science	Semester: I	Session: 20	024-25			
(0	Certificate/ Diploma/ L	Degree/ Honors)						
1	Course Code		PHSC- 01P					
2	Course Title							
3	Course Type		Discipline Specific Co	ourse				
4	Pre-requisite (if any)	. 0						
5	Course Learning							
	Outcomes (CLO)	,						
		The Students will be able to						
		> Assemble red	quired parts/devices and	arrange them to	perform			
		experiments.						
		Record/ obs	erve data as required	by the expe	erimental			
l		objectives.						
		Analyze reco	rded data and formulate is	to get desired r	esults.			
		> Interpret res	ults and check for a	ttainment of	proposed			
		objectives rel	ated to laws of mechanics	and its applicat	tions			
6	Credit Value	01 Credit 1 Cre	edit = 30 HoursLaborate	ory Work				
7	Total Marks	Maximum Mark	s: 50 Minimum I	Pass Marks: 20				
PAI	RT – B: CONTEN	T OF THE CO	URSE					
	TotalNo.of lear	ning-Training/perf	ormance Periods-30 Perio	ods (30 Hours)				
Sr.	Objects (A	t least 10 of the fo	llowing or related Exper	riments)	No. of			
No.					Period			
1	Measurements of I	ength (or diameter)	using vernier caliper, scr	ew gauge and				
2	To study the rando		ione		30			
3			calculate (a) Spring cons	tant and (b) a	-			
4	To determine the N			tant and, (b) g.				
5			ly falling body using Dig	ital Timing	-			
	Technique.		,	5				
6			of water by Capillary Flo	w Method				
	(Poiseuille's metho							
7			a Wire by Optical Lever					
$-\frac{8}{9}$			of a Wire by Maxwell's					
10	To determine the v	The second secon	wire by Searle's method					
11	To determine the v							
12	Study of bending o							
13			irregular body by Inertia	Table				
Keywo	Moment of Inertia, Pe	ndulum, Vernier Callipe	rs, Screw Gauge, Travelling m	icroscope, Elastic	Constant,			
	Searle's Method, Stoke	's Method, Cappilary I	Rise Method, Viscosity, Surfac	e Tension				
signe	atureofConvener&Mei	nbers (CBoS) :	W St.	Law any	1.0 / 1			

SignatureofConvener&Members (CBoS)

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PART - C: Learning Resources

Text Books, Reference Books and others

Text Books Recommended-

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

Reference Books Recommended-

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

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

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

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

- 2. Virtual Lab : https://vlab.amrita.edu/?sub=1&brch=74
- 3. https://vlab.amrita.edu/?sub=1&brch=74&sim=571&cnt=1
- 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 Internal Test / Quiz - (2): 10 & 10 Better marks out of the two Test/Quiz +Marks obtained in

Assessment (CIA): Assignment/Seminar +Attendance -05 Total Marks -(By Course Teacher) 15

Assignment shall be considered against 15 Marks Managed by Course

End Semester Laboratory Performance: On spot Assessment Performed the Task based on lab. work -20 Marks Exam (ESE):

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

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

Name and Signature of Convener & Members of CBoS:

teacher as per lab.



GOVT. DIGVIJAY AUTO. PG COLLEGE RAJNANDGAON (CHHATTISHGARH)

SYLLABUS AND MARKING SCHEME FOR B.Sc. WITH PHYSICS SESSION 2025-26 SEMESTER - II

• THEORY PAPER:

Class	Paper	Course title	Course code	Credit value	Theory marks	Internal marks	Passing marks
SemII	DSC	ELECTRCITY AND MAGNETISM	PHSC-02T	3	70	30	40
SemII	GE	ELECTRCITY AND MAGNETISM	PHGE-02T	3	70	30	40

• PRACTICAL/PROJECT PAPER:

Class	Paper	Course title	Course code	Credit value	Practical + viva marks+ Sessional	Internal assessment :	Passing marks
SemII	DSC	ELECTRCITY AND MAGNETISM	PHSC-02P	1	35	15	20
SemII	GE	ELECTRCITY AND MAGNETISM	PHGE-02P	1	35	15	20
SemII	SEC	BASIC ELECTRICAL SKILL	PHSEC -01	3	35	15	20

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GOVT. LIGY BY COLLEGE RAJNANDGAON (C.G.) (An Autonomous College Affiliatted With

Hemchand Yadav Visnwavidyalaya, Durg)

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

		COURSE CUI	RRICULU	JM			
PART	Γ – A: INTRODU	CTION					
-	Program: Bachelor	in Science	Semes	ster: II	Session: 2024	-25	
(Ce	rtificate/ Diploma/ Do	egree/ Honors)					
1 C	Course Code]	PHSC-02T			
2 C	Course Title		ELECTRICITY AND MAGNETISM				
3 C	Course Type	Discipline Specific Course					
4 P	re-requisite (if any)	As per Program					
	Course Learning Outcomes (CLO)	After going through the course, the student should be able to: > State various laws related with electrostatics, dielectric, electric 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 simple geographic situations.					
		Derive and an	alyze Maxwe				
	Credit Value			,	ning &Observation	1	
7 T	otal Marks	Maximum Marks	s: 100	Minimum	Pass Marks: 40		
ART	- B: CONTENT (OF THE COURS	SE				
	TotalNo.of Teachin	g-learning Periods ((01 Hr. per p	eriod) - 45 F	Periods (45 Hours)		
Unit		Topics (Course contents)			No. of Period		
of Vector fields, application in elec electric flux, Gaus		ivergence & Curl of V Gauss-divergence theo ostatics and magnetos is theorem of electrost arge, infinite line of ch	Vector fields, orem and Storest statics. Electratics, Applic	Line, surface oke's theorem ostatics field ations of Gau	and volume integrals of vectors and its : Electrostatic Field, iss theorem- Electric		
II	Electrostatic potent a point charge, Calc capacitor, Energy pe Dielectric & Electr Gauss's theorem i dielectric.Steady cur	tial: Electric potential is ulation of electric fier unit volume in electric Currents: Dielectric dielectrics, Paral rent, current density Jerent in LR, CR, LCR	as line integrald from poter costatic field. ric medium, lel plate cal, non – stead	al of electric to ntial, Capacita Polarisation, apacitor com	field, potential due to nince of Parallel plate Displacement vector, upletely filled with	13	
III Magnetism: Magne circular coil, solenoi vector potential, Am Magnetic properties		tostatics: Biot-Savart's law and its applications- straight conductor, d carrying current, Divergence and curl of magnetic field, Magnetic				10	
IV	Electromagnetic In self and mutual indufield. Maxwell's equation	duction: Faraday's la actance, L of single cons and Electromagne	aws of electroil, M of two etic wave pro	romagnetic in coils, Energ	duction, Lenz's law, sy stored in magnetic quation of continuity	10	
Keyword	Vector calculus,		trics and Ele	ectric Current	, Magnetism, Electro	magneti	
	reofConvener&Memb	Il's Equation and Elec	The second secon	the same of the sa	A		
igriatu. S	reojconveneraviemo RA - ashist	M. Mu	wer_	Suitoe	Soul Day	3'	

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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

- 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

 <u>https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Kma0</u>

 <u>VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoC1LsQAvD_BwE</u>
- 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/ceel
- 8. Classical Electromagnetism 2 (Electrostatics) https://bsc.hcverma.in/course/cee2

PART – D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks: 100Marks

Continuous Internal Assessment (CIA):30 Marks

End Semester Examination (ESE): 70 Marks

Elia Schicatei Examin	ation (Bob). (Circuit	
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):		Mark; Q2. Short answer type- 5x4 =20Marks
	Section B: Descriptive answer type,100	it of 2 from each unit-4x10=40 Marks

Name and Signature of Convener & Members of CBoS:

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RAJNANDGAON (C.G.)
(An Autonomous College Affiliatted With

(An Autonomous College Allinder) Hemchand Yadav Vishwavidyalaya, Durg) FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28) DEPARTMENT OF PHYSICS

COURSE CURRICULUM

	Program:B:	achelor in Science	Semester: II	Session: 2024-2	25
(Ce	ertificate/ Dip	loma/ Degree/ Honors)			
1	Course Code		PHSC- 02	P	
2	Course Title		Electricity & Ma	gnetism	
3	Course Type		Discipline Specifi	c Course	
4	Pre-requisite (As per progr		
6 7	Course Learni Outcomes (CL Credit Value Total Marks	working laws of able to Verify varicuits. A experiment of the properties of the pro	rious laws in electricity and slaw and learn about the sinstruments bserve data as required by the data and formulate it to get diresults and check for attainn Electricity, Magnetism and it Credit = 30 Hours Laborarks: 50 Minimum	I EMWs. The students will theorems, using simple ices and arrange them to demagnetism such as Le construction, working of experimental objectives is applications	ll also be electric perform nz's law, f various Analyze
PAR		NTENT OF THE CO			
	Tota	INo.of learning-Training,	/performance Periods -30		
Sr.	Tota	INo.of learning-Training,			No. of
Sr. No.	Tota	No.of learning-Training, Dijects (At least 10 of th	/performance Periods -30 e following or related Ex	periments)	
Sr.	To use a M	No.of learning-Training, Dijects (At least 10 of the	/performance Periods -30 e following or related Ex a) Resistances, (b) AC and	periments)	Periods
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Sr. No. 1	To use a Min Current, and To compare	No.of learning-Training, Dijects (At least 10 of the altimeter for measuring (at (d) checking electrical for the capacitances using De'S	/performance Periods -30 le following or related Ex a) Resistances, (b) AC and fuses. Gauty's bridge.	DCVoltages,(c) DC	Periods
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Sr. No. 1 2 3 4 5	To use a Micurrent, and To compare Measureme To study the To study a sector. To study a positive factor.	No. of learning-Training, Dijects (At least 10 of the altimeter for measuring (and (d) checking electrical for capacitances using De'S and of field strength B and the Characteristics of a Series LCR circuit and decorallel LCR circuit and cor Q.	/performance Periods -30 le following or related Ex la) Resistances, (b) AC and fuses. Sauty's bridge. lits variation in a Solenoid lies RC Circuit. termine its (a) Resonant Fr	DCVoltages,(c) DC Determine (dB/dx). requency, (b) Quality	Periods
Sr. No. 1 2 3 4 5	To use a Micurrent, and To compare Measureme To study the To study a sector. To study a positive factor.	No. of learning-Training, Dijects (At least 10 of the altimeter for measuring (and (d) checking electrical for capacitances using De'S and of field strength B and the Characteristics of a Series LCR circuit and departs and the capacitant of control of the contr	/performance Periods -30 le following or related Ex la) Resistances, (b) AC and fuses. Sauty's bridge. lits variation in a Solenoid lies RC Circuit. termine its (a) Resonant Fr	DCVoltages,(c) DC Determine (dB/dx). requency, (b) Quality	Periods
Sr. No. 1 2 3 4 5	To use a MicCurrent, and To compare Measureme To study the To study a series Factor. To study a policy factor To determine To verify the To study the To study a policy factor To determine To verify the To Study the To study a policy factor To determine To verify the To study a policy factor To study a policy factor To determine To verify the To study a policy factor T	Dijects (At least 10 of the altimeter for measuring (at (d) checking electrical for apacitances using De'S and of field strength B and the Characteristics of a Series LCR circuit and decorallel LCR circuit and cor Q. The a Low Resistance by Core Thevenin and Norton the action (A) and (b) are a Low Resistance by Core Thevenin and Norton the action (A) are a Low Resistance by Core Thevenin and Norton the action (A) are a Low Resistance by Core Thevenin and Norton the action (A) are a Low Resistance (B) are a Low Resi	/performance Periods -30 le following or related Ex la) Resistances, (b) AC and fuses. Sauty's bridge. lits variation in a Solenoid les RC Circuit. termine its (a) Resonant Fi lettermine its (a) Anti-resor Carey Foster's Bridge. heorem.	DCVoltages,(c) DC Determine (dB/dx). requency, (b) Quality mant frequency and(b)	Periods
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Sr. No. 1 2 3 4 5	To use a Micurrent, and To compare Measureme To study the To study a sector. To verify the To verify the To use a vite	INo. of learning-Training, Deficts (At least 10 of the Collimeter for measuring (and (d) checking electrical for capacitances using De'S and of field strength B and are Characteristics of a Series LCR circuit and decor Q. The a Low Resistance by College a Low Resistance by College a Low Resistance by College Thevenin and Norton the Superposition, and Macoration magnetometer and	/performance Periods -30 le following or related Ex a) Resistances, (b) AC and fuses. Sauty's bridge. its variation in a Solenoid les RC Circuit. termine its (a) Resonant Fr determine its (a) Anti-resor Carey Foster's Bridge. heorem. ximum Power Transfer The distudy magnetic field.	DCVoltages,(c) DC Determine (dB/dx). requency, (b) Quality mant frequency and(b)	Periods
Sr. No. 1 2 3 4 5 6 7 8 9	To use a MicCurrent, and To compare Measureme To study the To study a sector. To study a sector. To study a sector. To determine To verify the To use a vibus Study of many sector.	INO. of learning-Training, Dejects (At least 10 of the plantimeter for measuring (and (d) checking electrical for capacitances using De'S and of field strength B and are Characteristics of a Series LCR circuit and describe and the parallel LCR circuit and describe a Low Resistance by Control of the Control of the Superposition, and Main aration magnetometer and agnetic field due to a current strength of the control of the superposition of the sup	/performance Periods -30 le following or related Ex la) Resistances, (b) AC and fuses. Sauty's bridge. lits variation in a Solenoid les RC Circuit. letermine its (a) Resonant Fr lettermine its (a) Anti-resor lettermine its (b) Anti-resor lettermine its (c) Anti-resor	DCVoltages,(c) DC Determine (dB/dx). requency, (b) Quality mant frequency and(b)	Periods
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Text Books, Reference Books and Others

Text Books Recommended-

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

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

Name and Signature of Convener & Members of CBoS:

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GOVT. LIGVINY COLLEGE RAJNANDGAON (C.G.) (An Autonomous College Affiliatted With

FOUR YEARS UNDERGRADOATE PROGRAM (2024-28) DEPARTMENT OF BUILDINGS

COURSE CURRICULUM

D. D.	m	COURSE CUR	MCULUI				
PAR	T – A: INTRODU						
	Program: Bachelor i		Semes	ter: II	Session: 2024	-25	
(Co	ertificate/ Diploma/ De	gree/ Honors)				•	
1	Course Code			HGE-02 T			
2	Course Title		ELECTRICITY AND MAGNETISM				
3 (Course Type	Generic Elective Course					
4 1	Pre-requisite (if any)	As per Program					
5 (Course Learning	After going through the course, the student should be able to:					
- (Outcomes (CLO)				ics, dielectric, electric	current,	
		magnetism an Apply vector	d electromagn	tetic induction	's law) and scalar	(electric	
		potential, elec	tric potential	energy) forma	lisms of electrostatics		
		> Compare rise	and decay of	current in LR,	CR, LCR circuits.		
		Apply Biot-S	avart law for	calculation	of magnetic field in	simple	
		geographic sit		10			
	O NAVALA	Derive and an	alyze Maxwe	ers for Lear	ning & Observation	n	
	Credit Value	Maximum Marks			Pass Marks: 40		
	Total Marks			Minimum	Lass Marks. 40		
PART	- B: CONTENT C	OF THE COURS	SE				
	Total No. of Teachin	g-learning Periods	(01 Hr. per p	period) - 45 P	eriods (45 Hours)		
Unit			urse content			No. of	
Omi						Periods	
I	Power plants in Chl	ıattisgarh: An overvi	ew of thermal	and hydroele	ctric power plants in	12	
	Chhattisgarh. Vector Analysis: Div	versiones & Curl of V	ector fields I	ine surface a	nd volume integrals		
	of Vector fields G	vergence & Curi of v	rem and Sto	ke's theorem	of vectors and its		
	application in electro	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	electric flux. Gauss's theorem of electrostatics, Applications of Gauss theorem- Electric					
	field due to point cha	field due to point charge, infinite line of charge, plane charged sheet, charged conductor.					
11	Electrostatic potenti	Electrostatic potential: Electric potential as line integral of electric field, potential due to					
	a point charge, Calculation of electric field from potential, Capacitance of Parallel plate capacitor, Energy per unit volume in electrostatic field.						
	Dielectric & Electri	c Currents: Dielectr	ic medium, F	Polarisation, D	isplacement vector,		
	Gauss's theorem in d	lielectrics, Parallel pl	ate capacitor	completely fi	lled with dielectric.		
	Steady current, current	nt density J, non – ste	eady current a	and Continuity	equation, Rise and		
	decay of current in LI Magnetism: Magnet	R, CR, LCR circuits.	a law and ite	applications	straight conductor	10	
111	circular coil, solenoid	ostatics: Biot-Savart: Leartying current. Di	vergence and	curl of magn	etic field, Magnetic		
	vector potential Amn	ere's circuital law.					
	Magnetic properties	of materials: Magnet	ic intensity, i	magnetic indu	ction, permeability,		
	magnetic susceptibilit	y, Brief introduction	of dia, para ai	nd ferro-magn	etic materials.	10	
IV	Electromagnetic Ind	luction: Faraday's law	vs of electrom	Energy store	don, Lenz's law, self	10	
	and mutual inductance	e, L of single coil, iv	i oi two colls	, Dieigy atore	a magnette mera.		
	Maxwell's equations	and Electromagneti	ic wave propa	agation: Equa	tion of continuity of		
	current Displacement	t current, Maxwell's e	quations, Was	ve equation in	free space.		
Kanna-	. Vector calculus, E	lectrostatics, Dielect	rics and Elec	etric Current,	Magnetism, Electron	magnetic	
Kevwor	muuchon, waxwen	's Equation and Elect	romagnetic V	Vave Propagat	ion	8.4	
Sianatu	re of Convener & Mem	bers (CBoS) :	1	1 ///0/	7		

Text Books, Reference Books and Others

Text Books

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

Reference Books

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

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

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

https://www.motionmountain.net/?gclid=CjwKCAjwmq3kBRB_EiwAjkNDp5v8Yy6xK1s0Kma0 VR0AWGlichRwFfCC0-vpZK1jrPoEOAnBq8fcqRoCILsQAvD_BwE

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

PART - D: Assessment and Evaluation

Suggested Continuous Evaluation Methods: Maximum Marks: 100 Marks Continuous Internal Assessment (CIA): 30 Marks End Semester Examination (ESE): 70 Marks Continuous Internal Internal Test/ Quiz (2): 20 + 20Better marks out of the two Test / Ouiz Assessment (CIA): Assignment/ Seminar (1): 10 + marks obtained in Assignment shall be (By course teacher) Total Marks: 30 considered against 30 Marks **End Semester** Two section - A & B Section A: Q1. Objective - 10 x1= 10 Mark; Q2. Short answer type- 5x4 = 20 Marks Examination (ESE): 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:

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RAJNANDGAON (C.G.) (An Autonomous College Affiliatted With

Hemchand Yadav Visnwavidyalaya, Durg)
FOUR YEARS UNDERGRADUATE PROGRAM (2024 – 28)

DEPARTMENT OF PHYSICS COURSE CURRICULUM

	Program: Bachelor	in Science	Semester: II	Session: 2024-	25	
(C	Certificate/ Diploma/ De	egree/ Honors)				
1	Course Code		PHGE- 02	P		
2	Course Title	Electricity & Magnetism				
3	Course Type	Generic Elective Course As per program				
4	Pre-requisite (if any)					
5	Course Learning Outcomes (CLO)	laws of Electricit Verify vari circuits. As experiments Verify vari Faraday's measuring i Record/ obs recorded do Interpret re	ous laws in electricity an law and learn about the	The students will also be a theorems, using simplices and arrange them to disconstruction, working a construction, working a construction objective desired results.	able to le electri o perfori enz's law of variou s. Analyz	
6	Credit Value	01 Credit 1 C	Credit = 30 Hours Labor	ratory Work		
7	Total Marks	Maximum Mar		Pass Marks: 20		
$\overline{\mathbf{P}\mathbf{A}}$	RT - B: CONTENT	OF THE CO	URSE	1		
			performance Periods - 3	Periods (30 Hours)		
Sr			following or related Ex		No. of	
No		,				
1	To use a Multimeter	for measuring (a)	Resistances, (b) AC and	DC Voltages,(c) DC		
	Current, and (d) che	cking electrical fu	ises.		30	
2	To compare capacit					
3	Measurement of fie	d strength B and i	ts variation in a Solenoic	Determine (dB/dx).	1	
4						
_	To study a series I (
5	Factor.	CR circuit and dete	ermine its (a) Resonant F	requency, (b) Quality		
6	Factor.	CR circuit and de	etermine its (a) Anti-reso			
6	Factor. To study a parallel I (b) Quality factor Q To determine a Low	CR circuit and de	etermine its (a) Anti-reso			
6 7 8	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve	CR circuit and de Resistance by Ca	etermine its (a) Anti-reso arey Foster's Bridge. eorem.	nant frequency and		
6 7 8 9	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve To verify the Super	CR circuit and de Resistance by Ca nin and Norton the position, and Max	etermine its (a) Anti-reso arey Foster's Bridge. eorem. imum Power Transfer Th	nant frequency and		
6 7 8 9	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve To verify the Super	CR circuit and de Resistance by Ca nin and Norton the position, and Max nagnetometer and	etermine its (a) Anti-reso arey Foster's Bridge. eorem. imum Power Transfer Th study magnetic field.	nant frequency and		
6 7 8 9 10	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve To verify the Super To use a vibration m Study of magnetic f	CR circuit and de Resistance by Ca nin and Norton the position, and Max nagnetometer and ield due to a curre	etermine its (a) Anti-reso arey Foster's Bridge. eorem. imum Power Transfer The study magnetic field. nt loop.	nant frequency and		
6 7 8 9 10 11	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve To verify the Super To use a vibration m Study of magnetic f	CR circuit and de Resistance by Canin and Norton the cosition, and Max nagnetometer and ield due to a curre ields using Deflec	etermine its (a) Anti-reso arey Foster's Bridge. eorem. imum Power Transfer The study magnetic field. nt loop. tion Magnetometer	nant frequency and		
6 7 8 9 10	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve To verify the Super To use a vibration m Study of magnetic f Study of magnetic f Mini Project: Constru	CR circuit and de Resistance by Canin and Norton the cosition, and Maxinagnetometer and ield due to a curre ields using Deflection and Study of Stu	etermine its (a) Anti-reso arey Foster's Bridge. eorem. imum Power Transfer The study magnetic field. nt loop. tion Magnetometer Solenoid and measurement	neorem.		
6 7 8 9 10 11 12 13 Key	Factor. To study a parallel I (b) Quality factor Q To determine a Low To verify the Theve To verify the Supery To use a vibration m Study of magnetic f Study of magnetic f Mini Project: Constructions	CR circuit and de Resistance by Canin and Norton the Position, and Max nagnetometer and ield due to a curre ields using Deflection and Study of Sapacitance Compacticuit, Low Resis	etermine its (a) Anti-reso arey Foster's Bridge. eorem. imum Power Transfer The study magnetic field. nt loop. tion Magnetometer	nant frequency and neorem. of its magnetic field RC Circuit, Series LCF	Circuit	

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

Internal Test / Quiz-(2):

6. https://jigyasa-csir.in/cgcri/n12-t4-a3/

PART - D: ASSESSMENT AND EVALUATION

Suggested Continuous Evaluation Methods:

Maximum Marks:

50 Marks

Continuous Internal Assessment (CIA):

15 Marks

End Semester Exam(ESE):

35 Marks

Continuous	Internal
Assessment ((CIA):
(By Course Tead	her)

Assignment/Seminar +Attendance -05 Total Marks -15

Test / Quiz + Marks obtained in Assignment shall be considered against 15 Marks

Better marks out of the two

End Semester Exam (ESE):

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

20 Marks Spotting based on tools & technology (written) - 10 Marks - 05 Marks

10 & 10

Course teacher as per lab. status

Managed by

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

RAJNANDORUN (C.G.) (An Autonomous College Affiliatted With

Hemchand Yadav Visnwavidyalaya, Durg) FOUR YEARS UNDERGRADUATE PROGRAM (2024-28) **DEPARTMENT OF PHYSICS**

COURSE CURRICULUM

	P	rogram: Ba	chelor in Science	:	Semester: II/ IV/V/ VI	Session: 20	24-25	
((Certi	ficate/ Diplo	ma/ Degree/ Ho	nors)				
1	1	rse Code			PHSEC- 01			
2	Cou	rse Title						
				Basic Electrical Skill				
3		rse Type		Skill Enhancement Course				
4		requisite (if		As per Program				
5	Cou	rse Learning		On successful completion of the course, student is expected to enhance his				
	Outo	comes (CLO	, ,	electrical skill through:				
				 Understanding importance of accuracy in measuring physical quantities Using basic mechanical tools. 				
				Using various measuring instruments.				
6	Crad	lit Value		Fault finding and repairing simple domestic appliances				
U	Cico	iit value		02 Credits 1 Credit= 15 Hours for Theoretical Learning & =				
_	_		(1C+1C)	,				
7		l Marks	Maximur			ass Marks: 20		
PA	RT –	B: CONT	ENT OF THE	COU	RSE			
			Total	No. of T	eaching-learning Periods:			
		Theory - 15	Periods (15 Hrs) an	d Lab. or	Field learning/Training 30 Pe	riods (30 Hours)		
		,	120 1110/ 211		Tiera rearring, Training 30 7 c	1003 (00 110013)	No. o	
Mo	dule		Topic (Course Contents)					
							Perio	
	ı	Measurement: Idea about accuracy in measurement, measuring devices for commonly					15	
		used physi-	cal quantities (Le	ength, M	ass, Density, Temperature,	Power, Current,	13	
		Voltage, Re	sistance, capacitano	ce, inducti	ance, frequency etc).			
		D.C. Circu	it: Ohms law, Serie	es and pa	rallel resistance circuit, Kirchl	off's law& their		
		application,	cation, Primary and secondary cells, maintenance of secondary cells.					
				eneration of AC voltage, wave shape, frequency, peak, average,				
		A.C. Circu	its: Generation of	[AC vol	tage, wave shape, frequency	, peak, average,		
		instantaneou	ıs & RMS values, i	dea about	tage, wave shape, frequency R, L, C circiuits	, peak, average,		
		instantaneou Heating &	is & RMS values, i Lighting effects of	dea about current:	tage, wave shape, frequency R, L, C circiuits Joule's law of electric heating	, peak, average,		
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PART - A: INTRODUCTION

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/
- 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):

Continuous Internal Internal Test / Quiz-(2): 10 & 10

Assessment (CIA): Assignment/Seminar + Attendance - 05 / Quiz + marks obtained in (By Course Coordinator) Total Marks-15 Assignment shall be considered

against 15 Marks

Laboratory /Skill Performance: On spot Assessment Evaluation by **End Semester** Coordinator A. Performed the Task based on learned skill - 20 Marks Examination (ESE) B. Spotting based on tools (written) 10 Marks

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

Signature of Convener & Members (CBoS):

Better marks out of the two Test