B. Sc. Physics

Motto

Unlocking the secrets of the universe through the power of science.

Fisix Fest

Vision

Providing a strong foundation in Physics to prepare high quality technocrats

Mission

- To provide high quality in Physics education and equipping students for higher education.
- To develop sensitivity among students to contribute to the betterment of society through knowledge in Physics.

Preamble

The B.Sc. Physics programme at St. Joseph's College of Arts and Science for Women, Hosur (Autonomous), has been designed to provide a strong foundation in fundamental concepts while fostering critical thinking, analytical reasoning, and scientific inquiry. It aims to equip students with theoretical knowledge, experimental skills, and computational techniques essential for understanding and applying physical principles in diverse domains.

Recognizing the interdisciplinary nature and expanding frontiers of Physics, this syllabus incorporates a balanced integration of classical physics, modern developments, and emerging areas of research and technology. Emphasis is placed on conceptual clarity, problem-solving, hands-on laboratory experience, and relevance to real-world applications, including energy, environment, health, and technology.

The structure and content of the syllabus have been framed in alignment with the National Education Policy (NEP-2020) guidelines and learning outcomes-based frameworks to enhance employability, innovation, and higher education readiness. It supports students' intellectual growth, encourages independent thinking, and prepares them for careers in academia, industry, and research.

Nature and Extent of the Programme

The **Bachelor of Science – Physics (B.Sc. Physics)** is a foundational undergraduate programme that marks the entry point into the higher education framework in the field of Physics, both in India and globally. As a versatile and industry-relevant degree, B.Sc. Physics equips students with the necessary theoretical knowledge and practical skills to either pursue **immediate employment** or undertake **higher studies** in specialized areas of Physics.

Upon successful completion of the programme, graduates are well-prepared to explore diverse career opportunities in the data analysis, instrumentation, and scientific communication and other digitally-driven domains. They may serve in roles such as **Nuclear Physicist, Medical Physicist, Materials Scientist, Astrophysicist and Telecommunications Engineer** contributing meaningfully to organizational growth and societal advancement.

The curriculum developed under the **Learning Outcomes-based Curriculum Framework (LOCF)** incorporates comprehensive and diversified aspects of Physics. It emphasizes a balanced integration of **theoretical concepts, problem-solving skills, programming abilities**, and **professional competencies**. The programme also aims to impart a depth of knowledge that allows students to specialize in various domains of physics, while fostering innovation, critical thinking, and ethical responsibility.

Aim of the Programme

The primary aim of the **B.Sc. Physics undergraduate programme** is to provide students with a solid foundation in the core principles of physics, combining theoretical knowledge with practical, hands-on experience. The program seeks to develop critical thinking, problem-solving, and analytical skills, preparing students to understand and address complex physical phenomena. It fosters scientific curiosity and innovation while promoting interdisciplinary learning.

To achieve this, the programme integrates:

- **Scientific Communication and Ethics**: Emphasis on developing the ability to communicate scientific ideas effectively, both in writing and orally, while promoting ethical practices in research and scientific work.
- **Hands-On Experience**: Laboratory experiments and project-based learning, encouraging students to conduct research, collect data, and interpret results, enhancing their scientific inquiry skills.
- **Research and Innovation**: Opportunities for students to engage in independent research and explore innovative scientific ideas, fostering a culture of intellectual curiosity and creative thinking.

Duration of the Programme

The B.Sc. Physics programme shall extend over a period of **three academic years** comprising **six semesters**. Each academic year shall consist of **two semesters**:

- **Odd Semester**: June to November
- **Even Semester**: December to May

Each semester shall have **a minimum of 90 working days**, exclusive of examination days.

Eligibility for Admission

A candidate shall be eligible for admission to the B.Sc. Physics programme if she has passed the **Higher Secondary Examination of the Government of Tamil Nadu** or any other equivalent examination recognized by the University, with any one of the following subjects:

- Mathematics
- Mathematics with Computer Science

Credit Requirements and Eligibility for Award of Degree

A candidate shall be eligible for the **award of the B.Sc. PHYSICS degree** only if she has:

- Successfully completed the prescribed **course of study** in a college affiliated to the University for a **minimum duration of three academic years (six semesters)**.
- Passed all prescribed **semester examinations**.
- **Earned a minimum of 140 credits** as distributed under the following Parts:

Part I – Language
Part II – General English / Advanced English
Part III – Discipline Specific Core, Generic Specific Elective, Discipline Specific Elective, Professional Enhancement Course and Project
Part IV – Skill Enhancement Courses, Non-Major Electives, Internship, Environmental Studies, Digital Literacy, Women Studies and Indian Knowledge System
Part V – Extension Activity
The candidate must also have fulfilled any other requirements as prescribed by the College/University regulations for the award of the degree.

PROGRAMME OUTCOMES (POs)

PO1: Identify, analyze, and solve problems in physics using appropriate theoretical and experimental methods.
PO2: Design and perform Physics experiments, analyze data using appropriate tools, and interpret results with scientific reasoning.
PO3: Use modern scientific tools, software, and techniques necessary for modeling, computation, simulation, and experimentation in physics.
PO4: Communicate effectively on scientific topics with the physics community and with society at large, through reports, presentations, and discussions.
PO5: Understand the importance of professional ethics, environmental sustainability, and responsibility in scientific practices and research.
PO6: Demonstrate knowledge and skills to plan, execute, and manage mini-projects or research activities individually or as part of a team.
PO7: Understand the role of physics in societal development and apply physical principles in addressing real-world problems.
PO8: Understand the impact of physical processes and technologies on the environment and contribute to sustainable development.
PO9: Integrate knowledge from physics with other disciplines such as mathematics, computer science, engineering, and life sciences for innovative problem-solving.

PO10: Apply data science techniques such as statistical analysis, machine learning, and big data tools in analyzing complex physical systems and datasets.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Demonstrate a comprehensive understanding of key concepts and laws in classical mechanics, electromagnetism, optics, thermodynamics, quantum mechanics, and nuclear physics.
PSO2: Develop competence in using laboratory instruments, performing experiments, analyzing data, and interpreting physical phenomena through hands-on experience.
PSO3: Integrate physics knowledge with emerging fields such as electronics, nanotechnology, material science, and renewable energy to explore real-world applications.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Graduates will develop a strong foundation in fundamental and applied physics, enabling them to analyze, model, and solve scientific problems using theoretical and experimental approaches.
PEO2: Graduates will gain proficiency in using modern tools, instruments, and software for data analysis, simulation, and experimentation, preparing them for research, innovation, and higher education.
PEO3: Graduates will effectively integrate physics with interdisciplinary knowledge, demonstrate teamwork, and communicate scientific ideas clearly through written and oral means.

MAPPING OF PEO WITH PO AND PSO:

PEO \ Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
PEO1	3	3	2	1	1	2	3	2	3	1	3	3	2
PEO2	1	3	3	1	3	2	1	2	2	3	1	3	3
PEO3	2	1	2	3	3	3	2	3	3	2	2	2	3

3 = Strongly Related, 2 = Moderately Related, 1 = Slightly Related

Course Components and Credit Distribution

The curriculum framework for the B.Sc. Physics programme under the autonomous structure is designed to ensure holistic academic development, skill enhancement, and societal contribution. The credit distribution across the various components is as follows:

S. No.	Study Components	Part	Sem I		Sem II		Sem III		Sem IV		Sem V		Sem VI		No. of Hours	Total Credit
			No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit	No. of Hours	Credit		
1	Language	I	6	3	6	3	6	3	6	3					24	12
2	English	II	6	3	6	3	6	3	6	3					24	12
3	Core Course / DSC	III	9	7	9	7	9	7	9	7	20	15	14	12	70	55
4	Allied / GSE	III	5	4	5	4	5	4	5	4					20	16
5	Elective / DSE	III									8	8	8	8	16	16
6	PEC	III											2	2	2	2
7	Project	III											4	4	4	4
8	SEC	IV	2	2	2	2	2	2	2	2					8	8
9	NME	IV	2	2	2	2									4	4
10	Environmental Studies / IDC	IV					2	2							2	2
11	Digital Literacy / IDC	IV							2	2					2	2
12	Women Studies	IV									2	2			2	2
13	Indian Knowledge System / IDC	IV											2	2	2	2
14	Internship	IV										2				2
15	Extension Activity	V												1		1
	Total		**30**	**21**	**30**	**21**	**30**	**21**	**30**	**21**	**30**	**27**	**30**	**29**	**180**	**140**

Details of Course of Study for Parts I–V

PART I – Tamil and Other Languages

Students shall study Tamil or one of the other approved languages (e.g., Hindi or French), as per their choice and subject to availability. The syllabus and prescribed textbooks for these languages shall be periodically updated by the respective Boards of Studies and approved by the Academic Council of the College.

PART II – English

Courses in English aim to improve students' proficiency in language, literature, communication, and critical thinking. The curriculum and instructional materials are prepared by the Board of Studies of English and approved through the academic governance structure.

PART III – Core, Allied, Project and Elective Courses

This part comprises the Discipline Specific Core Courses, Generic Specific Elective, Discipline Specific Elective, Professional Enhancement Course and a Project in the final semester. The

content and structure of these courses are prescribed by the respective Board of Studies in Physics and approved by the Academic Council to align with current academic and industry standards.

PART IV – Value and Skill-Oriented Courses

i. Non-Major Elective (NME):

- Students must choose **Non-Major Elective (NME)** comprising from the options offered by other departments.

ii. Additional Courses under Part IV:

- Skill Enhancement Courses (SEC)
- Environmental Studies
- Women studies
- Indian Knowledge System
- Internship

PART V – Extension Activity

Students shall earn **a maximum of 1 credit** through participation in **Compulsory Extension Services**. Every student must enrol in **NSS, Red Ribbon Club, Youth Red Cross, Field Work, Outreach Activities or any other Clubs** recognized by the College.

Inclusion of Massive Open Online Courses (MOOCs) via SWAYAM and NPTEL

MOOC Courses for Credit Mobility

As part of the credit-based curriculum design and in alignment with the guidelines of higher education regulatory bodies, students are encouraged to enrol in Massive Open Online Courses (MOOCs) offered on SWAYAM or NPTEL platforms. These courses can be opted under Core, Elective, or Soft Skill categories. The student shall be eligible for award of the degree only upon submission of a valid certificate as proof of successful completion of the chosen MOOC course. **Two credits** will be given to candidates who successfully complete the course.

B.Sc., Physics Curriculum Design
First Year
Semester – I

S. No	Part	Nature the of Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language I	25UTAM101 25UFRE101 25UHIN101 25UKAN101 25UTEL101 25UURD101	Tamil - I French - I Hindi - I Kannada - I Telugu - I Urdu – I	6	3	25	75	100
2	II	English I	25UGEN101 25UAEN101	General English I Advanced English I	6	3	25	75	100
3	III	DSC I	25UPH1C01	Properties of Matter and Acoustics **(Skill Development)**	6	5	25	75	100
4		DSC I Practical I	25UPH1CP1	Core Practical I Properties of Matter Experiments **(Skill Development)**	3	2	40	60	100
5		GSE Allied I	25UMA1A02	Allied Mathematics I **(Skill Development)**	5	4	25	75	100
6	IV	SEC I	25UPH1SE1	Principles of Physics **(Employability)**	2	2	25	75	100
			25UPH1SE2	Home Electrical Installation **(Employability)**					
7		SEC II NME I		Non Major Elective I	2	2	25	75	100
Total					**30**	**21**	**190**	**510**	**700**

Semester – II

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language II	25UTAM202 25UFRE202 25UHIN202 25UKAN202 25UTEL202 25UURD202	Tamil - II French - II Hindi - II Kannada - II Telugu - II Urdu - II	6	3	25	75	100
2	II	English II	25UGEN202 25UAEN202	General English II Advanced English II	6	3	25	75	100
3		DSC II	25UPH2C02	Heat, Thermodynamics and Statistical Physics **(Skill Development)**	6	5	25	75	100
4		DSC II Practical II	25UPH2CP2	Core Practical II Heat, Oscillations, Waves & Sound Experiments **(Skill Development)**	3	2	40	60	100

5	III	GSE Allied II	25UMA2A02	Allied Mathematics II **(Skill Development)**	3	3	25	75	100
6		GSE Allied Practical I	25UMA2AP2	Allied Mathematics Practical I (**Skill Development)**	2	1	40	60	100
7	IV	SEC III	25UPH2SE1	Instrumentation **(Employability)**	2	2	25	75	100
			25UPH2SE2	Hardware skills **(Employability)**					
8		SEC IV NME II		Non Major Elective II	2	2	25	75	100
Total					**30**	**21**	**230**	**570**	**800**

Second Year
Semester – III

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language III	25UTAM303 25UFRE303 25UHIN303 25UKAN303 25UTEL303 25UURD303	Tamil – III French – III Hindi – III Kannada – III Telugu – III Urdu – III	6	3	25	75	100
2	II	English III	25UGEN303 25UAEN303	General English III Advanced English III	6	3	25	75	100
3	III	DSC III	25UPH3C03	General Mechanics & Classical Mechanics **(Skill Development)**	6	5	25	75	100
4		DSC III Practical III	25UPH3CP3	Core Practical III Electricity Experiments **(Skill Development)**	3	2	40	60	100
5		GSE Allied III	25UCH3A02	Allied Chemistry for Physical Sciences I (**Skill Development)**	5	4	25	75	100
6	IV	SEC V	25UPH3SE1	Computational Methods & Programming in C **(Skill Development)**	2	2	25	75	100
			25UPH3SE2	Quantitative Aptitude for Competitive Examinations **(Skill Development)**					
7		IDC I	25UEVS301	EVS	2	2	25	75	100
8				Health and Wellness *	-	-	-	-	-
Total					**30**	**21**	**190**	**510**	**700**

Semester – IV

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	I	Language IV	25UTAM404 25UFRE404 25UHIN404 25UKAN404 25UTEL404 25UURD404	Tamil - IV French - IV Hindi - IV Kannada - IV Telugu - IV Urdu - IV	6	3	25	75	100
2	II	English IV	25UGEN404 25UAEN404	General English IV Advanced English IV	6	3	25	75	100
3	III	DSC IV	25UPH4C04	Optics **(Skill Development)**	6	5	25	75	100
4		DSC IV Practical IV	25UPH4CP4	Core Practical IV Light Experiments **(Skill Development)**	3	2	40	60	100
5		GSE Allied IV	25UCH4A04	Allied Chemistry for Physical Sciences II **(Skill Development)**	3	3	25	75	100
6		GSE Allied Practical II	25UCH4AP2	Chemistry Practical for Physical and Biological Sciences **(Skill Development)**	2	1	40	60	100
7	IV	SEC VI	25UPH4SE1	Microprocessor 8085 and Its Applications **(Employability)**	2	2	25	75	100
			25UPH4SE2	Digital Photography **(Entrepreneurship)**					
8		IDC II	25UDL401	Digital Literacy	2	2	25	75	100
Total					**30**	**21**	**230**	**570**	**800**

Third Year
Semester – V

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	III	DSC V	25UPH5C05	Electricity and Magnetism **(Skill Development)**	5	4	25	75	100
2		DSC VI	25UPH5C06	Solid State Physics **(Skill Development)**	6	4	25	75	100
3		DSC VII	25UPH5C07	Atomic Physics **(Skill Development)**	6	5	25	75	100
4		DSC VII Practical V	25UPH5CP5	Core Practical V General Experiments **(Skill Development)**	3	2	40	60	100

5		DSE I	25UPH5E01	Energy Physics **(Employability & Entrepreneurship)**	4	4	25	75	100
			25UPH5E02	Fibre Optic Communication System (**Employability)**					
			25UPH5E03	Applied Physics **(Employability & Entrepreneurship)**					
6		DSE II	25UPH5E04	Digital Electronics **(Skill Development)**	4	4	25	75	100
			25UPH5E05	Mathematical Physics & Numerical Methods (**Skill Development**)					
			25UPH5E06	Astrophysics **(Skill Development)**					
7	IV	IDC III	25UWOS501	Women Studies	2	2	25	75	100
8		Internship	25UMA5INT	Internship	-	2	-	-	-
Total					**30**	**27**	**190**	**510**	**700**

Semester – VI

S. No	Part	Nature of the Course	Course Code	Name of the Course	Hours per Week	Credits	Marks		
							CIA	ESE	Total
1	III	DSC VIII	25UPH6C08	Nuclear Physics **(Skill Development)**	5	5	25	75	100
2		DSC IX	25UPH6C09	Quantum Mechanics & Relativity **(Skill Development)**	6	5	25	75	100
3		DSC Practical VI	25UPH6CP6	Core Practical VI Electronics Experiments **(Employability)**	3	2	40	60	100
4		DSE III	25UPH6E01	Nanoscience & Nanotechnology (**Industry 4.0)**	4	4	25	75	100
			25UPH6E02	Electronic Communication System **(Employability)**					
			25UPH6E03	Laser & Spectroscopy **(Employability)**					
5		DSE IV	25UPH6E04	Basic Electronics **(Skill Development)**	4	4	25	75	100
			25UPH6E05	Material Science **(Employability)**					

			25UPH6E06	Mobile Communication **(Employability & Entrepreneurship)**					
6		PEC	25UPEC601	Essential Aptitude and Logical Thinking	2	2	25	75	100
7	IV	IDC IV	25UIKS601	Indian Knowledge System	2	2	25	75	100
8		Project	25UPH6PRV	Project	4	4	50	50	100
9	V	Extension	25UEXT601	Extension Activity	-	1	-	-	-
Total					**30**	**29**	**240**	**560**	**800**
Grand Total					**180**	**140**	**1270**	**3230**	**4500**
		Extra Credit	**Mandatory**	**Extra Credit - Swayam/MOOC/NPTEL Online Course/ Self Study**	**-**	**2**	-	-	-
		Extra Credit	**Not Mandatory**	**Self-Study**	**-**	**2**	-	-	-
	*	**Extra Credit**	**Mandatory**	**Health and Wellness**	**-**	**1**	-	-	-

DSC	Discipline Specific Core
GSE	Generic Specific Elective - Allied
DSE	Discipline Specific Elective
NME	Non-Major Elective
IDC	Inter Disciplinary Course
SEC	Skill Enhancement Course
PEC	Professional Efficiency Course

Discipline Specific Elective Courses

Semester	Part	Nature of the Course	Course Code	Name of the Course
V	III	DSE I	25UPH5E01	Energy Physics **(Employability Entrepreneurship)**
			25UPH5E02	Fibre Optic Communication System **(Employability)**
			25UPH5E03	Applied Physics **(Employability &Entrepreneurship)**

		DSE II	25UPH5E04	Digital Electronics **(Skill Development)**
			25UPH5E05	Mathematical Physics & Numerical Methods **(Skill Development)**
			25UPH5E06	Astrophysics **(Skill Development)**
VI	III	DSE III	25UPH6E01	Nanoscience & Nanotechnology **(Industry 4.0)**
			25UPH6E02	Electronic Communication System **(Employability)**
			25UPH6E03	Laser & Spectroscopy **(Employability)**
		DSE IV	25UPH6E04	Basic Electronics **(Skill Development)**
			25UPH6E05	Material Science **(Employability)**
			25UPH6E06	Mobile Communication **(Employability & Entrepreneurship)**

Skill Enhancement Course

Semester	Nature of the Course	Course Code	Name of the Course
I	SEC I	25UPH1SE1	Principles of Physics **(Employability)**
		25UPH1SE2	Home Electrical Installation **(Employability)**
II	SEC III	25UPH2SE1	Instrumentation **(Employability)**
		25UPH2SE2	Hardware skills **(Employability)**
III	SEC V	25UPH3SE1	Computational Methods & Programming in C **(Skill Development)**
		25UPH3SE2	Quantitative Aptitude for Competitive Examinations **(Skill Development)**
IV	SEC VI	25UPH4SE1	Microprocessor 8085 and Its Applications (**Employability)**
		25UPH4SE2	Digital Photography (**Entrepreneurship)**

Non-Major Elective Courses

Subjects offered by the Department of Physics

Semester	Part	Nature of the Course	Course Code	Name of the Course
I	IV	NME I	25UPH1NM1	Physics in Everyday Life **(Skill Development)**
			25UPH1NM2	Space Science **(Employability)**

II	IV	NME II	25UPH2NM3	Renewable Energy sources **(Employability)**
			25UPH2NM4	Essential of Electricity **(Employability)**

Allied Courses offered to the Department of Physics

Semester	Part	Nature of the Course	Course Code	Name of the Course
I	III	GSE I	25UMA1A02	Allied Mathematics I **(Skill Development)**
II	III	GSE II	25UMA2A02	Allied Mathematics II **(Skill Development)**
			25UMA2AP2	Allied Mathematics Practical I **(Skill Development)**
III	III	GSE III	25UCH3A02	Allied Chemistry for Physical Sciences I (**Skill Development)**
IV	III	GSE IV	25UCH4A04	Allied Chemistry for Physical Sciences II (**Skill Development)**
			25UCH4AP2	Chemistry Practical for Physical and Biological Sciences **(Skill Development)**

Allied Courses offered by the Department of Physics

Semester	Part	Nature of the Course	Course Code	Name of the Course
III	III	GSE III	25UPH3A01	Fundamentals of Physics: Elasticity, Heat, Waves and Electromagnetism **(Skill Development)**
IV	III	GSE IV	25UPH4A02	Advanced Physics and Electronics **(Skill Development)**
			25UPH4AP1	Material Properties and Electronics Experiments **(Employability)**

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH1C01	**PROPERTIES OF MATTER AND ACOUSTICS**	**DSC THEORY**	**I**	**90**	**6**	**-**	**-**	**5**

Objective:

Study of the properties of matter leads to information which is of practical value to both the physicist and the engineers. It gives us information about the internal forces which act between the constituent parts of the substance. Students who undergo this course are successfully bound to get a better insight and understanding of the subject.

Unit	Course Content	Knowledge Levels	Sessions
I	**ELASTICITY** Hooke's Law – Types of moduli- **Stress-Strain Diagram – Elastic Constants**** – Poisson's Ratio – Relation between Elastic Constants and Poisson's Ratio – Work done in Stretching and Twisting a wire – Twisting Couple on a Cylinder – Rigidity Modulus by Static Torsion– Torsional Pendulum (With and Without Masses). ****SDG 9: Industry, Innovation & Infrastructure**	K2, K3	18
II	**BENDING OF BEAMS** Cantilever– Expression for Bending Moment – Expression for Depression at the Loaded end of the Cantilever– Oscillations of a Cantilever – Expression for Time Period – **Determination of Young's Modulus**** by Koenig's Method for Non-Uniform Bending– Experiment to determine Young's Modulus using Pin & Microscope by Uniform Bending. ****SDG 11: Sustainable Cities & Communities**	K3, K4	18
III	**FLUID DYNAMICS** **Surface Tension:** Definition – Molecular Forces– Excess Pressure over Curved Surface – Application to Spherical and Cylindrical drops and Bubbles – Determination of Surface Tension by Jaegar's Method– Variation of Surface Tension with Temperature. **Viscosity:** Definition **– Streamline and Turbulent Flow**** – Rate of Flow of Liquid in a Capillary Tube – Poiseuille's Formula –Corrections – Terminal Velocity and Stoke's Formula– Variation of Viscosity with Temperature. ****SDG 6: Clean Water & Sanitation**	K2, K3	18
IV	**WAVES AND OSCILLATIONS** Simple Harmonic Motion (SHM) – Differential Equation of SHM – Graphical Representation of SHM – Composition of Two SHM in a Straight Line and at Right Angles – Lissajous's Figures- **Free, Damped, Forced Vibrations – Resonance**** and Sharpness of Resonance. Laws of	K1, K3	18

	Transverse Vibration in Strings –Sonometer – Determination of AC Frequency using Sonometer –Determination of Frequency using Melde's String Apparatus ****SDG 7: Affordable & Clean Energy**		
V	**ACOUSTICS OF BUILDINGS AND ULTRASONICS** Intensity of Sound – Decibel – Loudness of Sound – Reverberation – Sabine's Reverberation Formula – Acoustic Intensity – Factors Affecting the **Acoustics of Buildings****. Ultrasonic Waves: Production of Ultrasonic Waves – Piezoelectric Crystal Method – Magnetostriction Effect – Application of Ultrasonic Waves. ****SDG 3: Good Health & Well-Being**	K2, K3	18

Course Outcomes	**CO1:** Relate elastic behavior in terms of three moduli of elasticity and working of torsion pendulum.	K2
	CO2: Able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials.	K2
	CO3: Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface; soap films provide an analogue solution to many engineering problems.	K2
	CO4: Analyze simple harmonic motions mathematically and apply them. Understand the concept of resonance and use it to evaluate the frequency of vibration. Set up experiment to evaluate frequency of ac mains	K1, K2
	CO5: Understand the concept of acoustics, importance of constructing buildings with good acoustics.	K2

Learning Resources	
Text Books	1. D.S. Mathur, 2010, Elements of Properties of Matter, S. Chand & Co. 2. BrijLal & N. Subramanyam, 2003, Properties of Matter, S. Chand & Co 3. D.R. Khanna & R.S. Bedi, 1969, Textbook of Sound.
Reference Books	1. C.J. Smith, 1960, General Properties of Matter, Orient Longman Publishers 2. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, R. Chand & Co. 3. A.P French, 1973, Vibration and Waves, MIT Introductory Physics, Arnold-Heinmann India.
Website Links	1. https://www.youtube.com/watch?v=GTnPEtksTEc 2. https://www.youtube.com/watch?v=uM2HpLBVAkA 3. https://www.youtube.com/watch?v=DW4rItB20h4
L – Lecture	**T – Tutorial** **P – Practical** **C - Credit**

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	2	2	2	2	3	2	2
CO2	3	2	2	3	2	1	2	1	2	2	3	2	2
CO3	3	3	2	1	2	1	2	2	2	2	3	3	3
CO4	3	3	3	2	3	2	2	3	2	2	3	3	2
CO5	2	2	1	2	3	1	3	3	2	3	2	2	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Saranya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr. B. K. Jaleesha	**Approved By: Dr. J. Caroline Rose** **Principal**

Dr. Kalyana Sundar, M.Sc., M.Phil., Ph.D., Assistant Professor Department of Physics, Periyar University Salem 11.	**Dr. M. Jose, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head (PG), PG & Research Department of Physics, Sacred Heart College (Autonomous), Tirupattur	**Dr. Pavithra, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head, PG & Research Department of Physics, Marudhar Kesari Jain College for Women (Autonomous), Vaniyambadi.
Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.	**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH1CP1	**PROPERTIES OF MATTER EXPERIMENTS**	**DSC PRACTICAL**	**I**	**45**	**-**	**-**	**3**	**2**

Objective:

Apply various physics concepts to understand Properties of Matter, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results.

S. No	List of Experiments (Any 7)	Knowledge levels
	****SDG 4 – Quality Education**	
1	Determination of rigidity modulus with & without masses using Torsional pendulum.	K4
2	Determination of Young's modulus by Uniform bending – Pin and Microscope.	K4
3	Verification of Hook's law by stretching of wire method.	K2
4	Determination of Young's modulus by non-uniform bending – scale & telescope.	K4
5	Determination of Young's modulus by cantilever – load depression graph.	K3
6	Determination of Young's modulus by Koenig's method in Non-Uniform Bending method	K5
7	Determination of rigidity modulus by static torsion.	K3
8	Determination of surface tension & interfacial surface tension by drop weight method.	K4
9	Determination of 'g' using compound pendulum	K3

Course Outcomes	**CO1:** Demonstrate understanding of the mechanical properties of materials through experimental techniques.	K2
	CO2: Apply physical principles and mathematical equations to determine physical constants like modulus, g, and viscosity.	K3
	CO3: Analyze data from experiments and interpret results with accuracy and scientific reasoning.	K4
	CO4: Use appropriate measuring instruments (e.g., telescope, micrometer, stopwatch) to perform and record experiments.	K3
	CO5: Communicate experimental observations and conclusions effectively through records, graphs, and calculations.	K5

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	2	1	1	1	3	3	2
CO2	3	3	2	1	1	1	2	1	2	2	3	3	2
CO3	3	3	2	2	1	2	2	1	2	2	3	3	2
CO4	2	3	3	2	1	2	1	1	2	2	2	3	2
CO5	1	2	2	3	2	2	1	1	2	2	2	2	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Saranya	**Verified By HOD: Mrs. T. Sivapriya**
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9/10/25 **Mr. R. Elavarasan, M.E.,** Managing Director, Pranav Solution, Krishnagiri.	Vijayalakshmi 9/10/2025 **Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH1SE1	**PRINCIPLES OF PHYSICS**	**SEC THEORY**	**I**	**30**	**2**	**-**	**-**	**2**

Objective:

To help students get an overview of Physics before learning their core courses. To serve as a bridge between the school curriculum and the degree programme.

Unit	Course Content	Knowledge Levels	Sessions
I	Vectors, Scalars –Examples for Scalars and Vectors from Physical Quantities – Addition, Subtraction of Vectors – Resolution and Resultant of Vectors – **Units and Dimensions****– Standard Physics Constants. ****SDG 4: Quality Education**	K1, K2	6
II	**Different Types of Forces****–Gravitational, Electrostatic, Magnetic, Electromagnetic, Nuclear –Mechanical Forces like, Centripetal, Centrifugal, Friction, Tension, Cohesive, Adhesive Forces. ****SDG 9: Industry, Innovation & Infrastructure**	K2, K2	6
III	Different forms of Energy– Conservation Laws of Momentum, Energy – Types of Collisions –Angular Momentum– **Alternate Energy Sources****– Real Life Examples. ****SDG 7: Affordable & Clean Energy**	K2, K3	6
IV	**Types of Motion****– Linear, Projectile, Circular, Angular, Simple Harmonic Motions – Satellite Motion – Banking of a Curved Roads – Stream Line and Turbulent Motions – Wave Motion – Comparison of Light and Sound Waves – Free, Forced, Damped Oscillations. ****SDG 11: Sustainable Cities & Communities**	K2, K3	6
V	Surface Tension – Shape of Liquid Drop – Angle of Contact – Viscosity – Lubricants – Capillary Flow – Diffusion – Real Life Examples– **Properties and Types of Materials in Daily use****- Conductors, Insulators – Thermal and Electric. ****SDG 12: Responsible Consumption & Production**	K2, K3	6

Course Outcomes	**CO1:** Apply concept of vectors to understand concepts of Physics and solve problems	K3
	CO2: Appreciate different forces present in Nature while learning about phenomena related to these different forces.	K2
	CO3: Quantify energy in different process and relate momentum, velocity and energy	K3
	CO4: Differentiate different types of motions they would encounter in various courses and understand their basis	K3

	CO5: Relate various properties of matter with their behavior and connect them with different physical parameters involved.	K3

Learning Resources	
Text Books	1. D.S. Mathur, 2010, Elements of Properties of Matter, S. Chand & Co 2. BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S. Chand & Co.
Reference Books	1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S. Chand & Co.
Website Links	1. https://www.youtube.com/watch?v=4ELxJ53mMHE 2. https://www.youtube.com/watch?v=uEnUG_1TYxc 3. https://www.youtube.com/watch?v=jhKejoBqiYc 4. https://www.youtube.com/watch?v=CqjxAYZ13QA
L – Lecture	**T – Tutorial** **P – Practical** **C - Credit**

Mapping of CO's with PO's and PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	2	1	2	4	2	1	3	2	1
CO2	3	2	2	1	2	3	2	2	2	2	3	2	2
CO3	3	2	2	1	2	1	2	2	2	2	3	2	2
CO4	3	1	1	2	2	3	2	1	2	1	3	1	1
CO5	2	2	2	3	2	3	2	2	2	3	2	2	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Saranya	**Verified By HOD: Mrs. T. Sivapriya**
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B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH1SE2	**HOME ELECTRICAL INSTALLATION**	**SEC THEORY**	**I**	**30**	**2**	**-**	**-**	**2**

Objective:

The students will get knowledge on electrical instruments, installations and domestic wiring techniques with safety precautions and servicing.

Unit	Course Content	Knowledge Levels	Sessions
I	**SIMPLE ELECTRICAL CIRCUITS** Charge, Current, Potential Difference, Resistance – Simple Electrical Circuits – DC Ammeter, Voltmeter, Ohmmeter – **Ohm's Law – Difference between DC And AC**** – Advantages of AC Over DC ****SDG 9: Industry, Innovation & Infrastructure**	K1, K2	6
II	**TRANSMISSION OF ELECTRICITY** **Production and Transmission of Electricity – Concept of Power Grid**** – Series and Parallel Connections – Technicalities of Junctions and Loops in Circuits – Transmission Losses (Qualitative) – Roles of Step-Up and Step- Down Transformers. ****SDG 7: Affordable & Clean Energy**	K2, K2	6
III	**ELECTRICAL WIRING** Different Types of Switches – Installation of Two-Way Switch – Role of Sockets, Plugs, Sockets - Installation of Meters – **Basic Switch Board**** – Electrical Bell – Indicator – Fixing of Tube Lights and Fans ****SDG 11: Sustainable Cities & Communities**	K2, K3	6
IV	**POWER RATING AND POWER DELIVERED** Conversion of Electrical Energy in to Different Forms – Work Done by Electrical Energy – Power Rating of Electrical Appliances – **Energy Consumption**** – Electrical Energy	K2, K3	6

	Unit in KWH – Calculation of EB Bill – Joule‟s Heating – Useful Energy and Energy Loss – Single and Three Phase Connections – Measures to Save Electrical Energy – **Energy Audit**.** ****SDG 12: Responsible Consumption & Production**		
V	**SAFETY MEASURES** Insulation for Wires – Colour Specification for Mains, Return and Earth – Understanding of Fuse and Circuit Breakers – Types of Fuses: Kit-Kat, HRC, Cartridge, MCB, ELCB – Purpose of Earth Line – Lighting Arrestors – Short Circuiting and Over Loading – Electrical Safety – Tips to avoid Electrical Shock – First Aid for Electrical Shock – Fire Safety for Electric Current ****SDG 3: Good Health & Well-Being**	K2, K3	6

Course Outcomes	**CO1:** Define and explain basic electrical quantities (charge, current, voltage), Ohm's law, and usage of electrical measuring instruments (galvanometer, ammeter, voltmeter, multimeter).	K1
	CO2: Describe and analyze the working, construction, types, and EMF equation of transformers, including voltage and current ratios and applications.	K2
	CO3: Differentiate and apply knowledge of AC and DC systems, single and three-phase connections, transformer losses, wiring methods, and electrical protection techniques.	K4
	CO4: Explain the working principles and demonstrate understanding of appliances such as bulbs, fans, refrigerators, mixers, UPS, etc.	K3
	CO5: Classify and evaluate different electrical heating and welding methods; identify related occupational hazards and safety measures.	K4

Learning Resources	
Text Books	1. P.L. Soni, P.V. Gupta and V.S. Bhatnagar, A text book in electric power, Dhanpat rai sons, 2. E.O. Taylor, Utilization of electrical energy, Orient Longman
Reference Books	1. H. Partas, Arts and Science of utilization of electrical energy Dhanpat Rai& Sons, New Delhi 2. B.L. Teraja and A.K. Teraja,A Textbook of Electrical Technology, S. Chand & Co. New Delhi (2006)
Website Links	1. https://www.youtube.com/watch?v=5lR5nf3gR8c 2. https://www.youtube.com/watch?v=2q09UeqZhpM 3. https://www.youtube.com/watch?v=CWulQ1ZSE3c&t=1s
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of COs with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	3	2	1	1	1	1	1	2	1	3	3	2
CO2	3	2	3	1	1	2	2	1	2	1	3	3	3
CO3	3	2	3	2	3	2	3	2	2	1	3	3	3
CO4	2	1	2	2	2	2	2	2	2	1	2	2	3
CO5	3	2	2	1	3	2	3	3	2	1	3	2	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Saranya	**Verified By HOD: Mrs. T. Sivapriya**
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Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.	**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH2C02	**HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS**	**DSC THEORY**	**II**	**90**	**6**	**-**	**-**	**5**

Objectives:

The course focuses to understand a basic in conversion of temperature in Celsius, Kelvin and Fahrenheit scales. Practical exhibition and explanation of transmission of heat in good and bad conductor. Relate the laws of thermodynamics, entropy in everyday life and explore the knowledge of statistical mechanics and its relation

Unit	Course Content	Knowledge Levels	Sessions
I	**HEAT**: Specific Heat Capacity – Specific Heat Capacity of Gases CP & CV– Meyer's Relation – Joly's Method for Determination of CV – Regnault's Method for Determination of CP- Low Temperature Physics: Joule-Kelvin Effect – Porous Plug Experiment – **Joule-Thomson Effect**** –Boyle temperature– Temperature of Inversion – **Liquefaction of Gas by Linde's Process**** – Adiabatic Demagnetisation ****SDG 9: Industry, Innovation and Infrastructure**	K1, K2	18
II	**THERMODYNAMICS-I**: Introduction –Thermodynamic system- Zeroth Law of Thermodynamics and Statement of First Law of Thermodynamics- Statement of Second Law of Thermodynamics – Introduction of Reversible and Irreversible process - Heat Engine – Efficiency of Heat Engine – **Carnot's Engine**** - Carnot's cycle- Construction, Working and Efficiency of Petrol Engine and **Diesel Engine**** – Comparison of Engines. ****SDG 7: Affordable and Clean Energy**	K2, K3	18
III	**THERMODYNAMICS-II**: Third Law of Thermodynamics –Entropy of an Ideal Gas – Entropy Change in Reversible and Irreversible Processes – T-S Diagram –-Thermodynamic potentials – Internal energy – Helmholtz function – Gibbs function– Enthalpy–**Maxwell's Thermodynamical Relations**-** Clausius-Clapeyron's Equation (First Latent Heat Equation) ****SDG 13: Climate Action**	K2, K3	18
IV	**HEAT TRANSFER**: Modes of Heat Transfer: Conduction, Convection and Radiation. Conduction: Thermal Conductivity – Determination of Thermal Conductivity of a Good Conductor by Forbe's Method – Determination Of thermal Conductivity of a Bad Conductor by Lee's Disc Method. Radiation: Black Body Radiation (Ferry's	K3	18

	Method) – Distribution of Energy in Black Body Radiation – **Wien's Law and Rayleigh Jean's Law –Planck's Law of Radiation – Stefan's Law**** – Deduction of Newton's Law of Cooling from Stefan's Law. ****SDG 11: Sustainable Cities and Communities**		
V	**STATISTICAL MECHANICS**: Definition of Phase-Space – Micro and Macro States – Ensembles – Different types of Ensembles – Classical and Quantum Statistics – **Derivation for Maxwell- Boltzmann Statistics**** -Expression for Distribution Function – Derivation for Bose Einstein Statistics- Derivation for Fermi- Dirac Statistics – Comparison of three statistics. ****SDG 4: Quality Education**	K3	18

Course Outcomes	**CO1:** Acquires knowledge on how to distinguish between temperature and heat. Introduce him/her to the field of thermometry and explain practical measurements of high temperature as well as low temperature physics. Student identifies the relationship between heat capacity, specific heat capacity.	K2, K3
	CO2: Derive the efficiency of Carnot's engine. Discuss the implications of the laws of Thermodynamics in diesel and petrol engines	K3
	CO3: Able to analyze performance of thermodynamic systems viz efficiency by problems. Gets an insight into thermodynamic properties like enthalpy, entropy	K3
	CO4: Study the process of thermal conductivity and apply it to good and bad conductors. Quantify different parameters related to heat, relate them with various physical parameters and analyse them	K3
	CO5: Interpret classical statistics concepts such as phase space, ensemble, Maxwell-Boltzmann distribution law. Develop the statistical interpretation of Bose-Einstein and Fermi-Dirac. Apply to quantum particles such as photon and electron.	K2, K3

Learning Resources	
Text Books	1. Brijlal &N. Subramaniam, 2000, Heat and Thermodynamics, S. Chand& Co. 2. Narayanamoorthy&KrishnaRao, 1969, Heat, Triveni Publishers, Chennai. 3. Brijlal and N. Subramanyam, 2001, Waves and Oscillations, Vikas Publishing House, New Delhi. 4. R. Murugeshan & Kiruthiga Sivaprasath, Thermal Physics, S. Chand& Co.
Reference Books	1. J.B.Rajam&C.L.Arora, 1976, Heat and Thermodynamics, 8th edition, S. Chand& Co. Ltd. 2. D.S.Mathur, Heat and Thermodynamics, Sultan Chand & Sons. 3. Gupta, Kumar, Sharma, 2013, Statistical Mechanics, 26th Edition, S. Chand & Co.
Website Links	1. https://youtu.be/M_5KYncYNyc 2. https://www.youtube.com/watch?v=w6VNUYIUV3s&t=16s 3. https://www.youtube.com/watch?v=0wn0R9qWbiQ
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of COs with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	1	2	2	2	1	3	2	2
CO2	3	1	2	1	2	1	2	2	2	2	3	1	2
CO3	3	1	2	1	2	2	2	2	2	3	3	2	2
CO4	3	2	3	1	2	1	2	2	2	2	3	3	2
CO5	3	1	2	2	2	1	3	2	3	3	3	1	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. T. Sivapriya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr. B. K. Jaleesha	**Approved By: Dr. J. Caroline Rose Principal**

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B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH2CP2	**HEAT, OSCILLATIONS, WAVES & SOUND EXPERIMENTS**	**DSC PRACTICAL**	**II**	**45**	**-**	**-**	**3**	**2**

Objective:

Apply their knowledge gained about the concept of heat and sound waves, resonance, calculate frequency of ac mains set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results.

S.No	List of Experiments (Any 7)	Knowledge levels
	SDG 4 – Quality Education	
1	Determination of thermal conductivity of bad conductor by Lee's disc method.	K2
2	To verify the laws of transverse vibration using Melde's apparatus.	K4
3	Determination of specific heat by cooling – graphical method.	K5
4	Determination of specific heat capacity of solid.	K3
5	Determination of thermal conductivity of rubber tube.	K3
6	Velocity of sound through a wire using Sonometer.	K4
7	Determination of frequency of an electrically maintained tuning fork	K4
8	To verify the laws of transverse vibration using sonometer.	K4
9	To compare the mass per unit length of two strings using Melde's apparatus.	K5

Course Outcomes	**CO1:** Understand the physical principles behind heat, sound, and radiation experiments.	K2
	CO2: Apply experimental techniques to measure physical constants like thermal conductivity, specific heat, etc.	K3
	CO3: Analyze vibrational and acoustic phenomena using instruments like the sonometer and Melde's apparatus.	K4
	CO4: Evaluate experimental data using graphical methods and compare it with theoretical values.	K6
	CO5: Design and conduct physics experiments to verify laws and determine material properties.	K6

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	1	2	2	1	3	2	1	1	3	2	2
CO2	3	3	3	2	2	2	2	2	2	2	3	3	2
CO3	3	3	3	2	2	2	2	1	2	2	3	3	2
CO4	3	3	3	2	1	2	1	1	2	3	3	3	2
CO5	3	3	3	2	2	3	2	2	3	3	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

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B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH2SE1	**INSTRUMENTATION**	**SEC THEORY**	**II**	**30**	**2**	**-**	**-**	**2**

Objectives:

To study the instruments with its principle and observe the method of their functioning. To provide a good foundation in measurements. To inspire interest in the knowledge of concepts regarding measurements.

Unit	Course Content	Knowledge Levels	Sessions
I	**PERFORMANCE CHARACTERISTICS OF AN INSTRUMENTATION SYSTEM:** Introduction – System configuration – Problem Analysis – Basic Characteristics of measuring devices – **Calibration - Generalized measurement**** ****SDG 9: Industry, Innovation, and Infrastructure**	K1, K2	6
II	**SENSORS AND TRANSDUCERS**: Basic principles of sensors – pressure sensor (Strain Gauge) – IR sensor - Characteristics of transducers – variable resistance transducer –variable capacitance transducer – **Voltage and current transducer**.** ****SDG 7: Affordable and Clean Energy**	K2, K3	6
III	**DIGITAL INSTRUMENTS:** Introduction – Digital Multimeter – Digital panel meter – Digital frequency meter – Digital measurement of time – Universal counter – Digital tachometer – **Digital PH meter****. ****SDG 6: Clean Water and Sanitation**	K2, K3	6
IV	**CLINICAL INSTRUMENTATION:** Anesthesia Machine- recording fetal heart movements and blood circulations using Doppler Ultrasonic Method –blood cell counter – B.P Measurement – direct and indirect method. Types of Gas Analyses ** - Oxygen, NO2 and H2S types – area radiation Dosimeter. ****SDG 4: Quality Education**	K3	6
V	**MEDICAL INSTRUMENTATION**: ECG - EEG – Lead systems and recording methods –typical waveforms – X-ray machine – Digital Stethoscope – Computer tomography – **MRI – Ultrasonography**** – Thermography – Pacemakers –Ventilators – Dialyzers. ****SDG 3: Good Health and Well-being**	K3	6

Course Outcomes	**CO1**: Understand the performance characteristics and dynamic behavior of instrumentation systems, including calibration and system response analysis.	K1, K2
	CO2: Explain the principles and applications of various sensors and transducers such as strain gauges, IR sensors, and variable resistance/capacitance devices.	K2, K3
	CO3: Apply knowledge of digital measuring instruments like digital multimeters, frequency counters, and digital pH meters for effective electronic measurements.	K2, K3
	CO4: Analyze the working and application of gas analyzers and pollution monitoring instruments including radiation dosimeters and air quality sensors.	K3
	CO5: Evaluate the principles and functionalities of medical diagnostic instruments like ECG, MRI, CT, and ventilators, and understand their importance in healthcare instrumentation.	K3

Learning Resources	
Text Books	1. Doebelin, Measurement Systems-Applications and Design, Tata McGraw Hill, (1990) 2. CS Rangan, GR Sharma, V.S.V. Mani, Instrumentation Devices and Systems, Second Edition, Tata McGraw Hill, (2011) 3. R.S. Khandpur, Handbook of Analytical Instruments, Tata McGraw Hill 4. (2003).
Reference Books	1. D. Patranabis, Sensors and Transducers, Prentice Hallof India, (1999) 2. M. Arumugam, Bio-medical Instrumentation, Anuradha Agencies, (2002) 3. John G. Webster, Medical Instrumentation: Application and Design, John Wiley &Sons Inc (2009) 4. John P. Bentley Principles of Measurement Systems, Third Edition, 5. Pearson Education, (2000)
Website Links	1. https://www.electronicsforu.com/technology-trends/learn-electronics/ir-led- infrared-sensor-basics 2. https://www.youtube.com/watch?app=desktop&v=MfCCy1SRF9A&t=85s 3. https://www.youtube.com/watch?v=AEq1wNIcWJM 4. https://www.youtube.com/watch?v=UTudEz0U_fo
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of COs with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	2	2	2	1	3	2	2
CO2	3	2	3	2	2	2	2	2	2	1	3	2	2
CO3	3	3	3	2	2	2	2	2	2	2	3	3	3
CO4	3	3	3	3	3	2	3	3	2	2	3	3	3
CO5	3	3	3	2	3	2	3	3	3	2	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. T. Sivapriya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr. B. K. Jaleesha	**Approved By: Dr. J. Caroline Rose Principal**

Dr. Kalyana Sundar, M.Sc., M.Phil., Ph.D., Assistant Professor Department of Physics, Periyar University Salem 11.	**Dr. M. Jose, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head (PG), PG & Research Department of Physics, Sacred Heart College (Autonomous), Tirupattur	**Dr. Pavithra, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head, PG & Research Department of Physics, Marudhar Kesari Jain College for Women (Autonomous), Vaniyambadi.
Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.	**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH2SE2	**HARDWARE SKILLS**	**SEC THEORY**	**II**	**30**	**2**	**-**	**-**	**2**

Objective:

To provide students with fundamental knowledge of personal computer hardware components, their functions, and servicing techniques. The course aims to develop practical skills in installation, configuration, maintenance, and troubleshooting of computer systems and peripherals.

Unit	Course Content	Knowledge Levels	Sessions
I	**PC - OVERVIEW** Personal computer system – **Block diagram**** – PG system unit – layout – lower model – **motherboard daughter boards**** – SMPS – Front panel controls – display unit – keyboard – rear side connectors and their uses ****SDG 4: Quality Education**	K1, K2	6
II	**HARDWARE** Basics – ROM BIOS – organization – services – hardware – BIOS – DOS Diskette basics – tracks sectors – types – 3-5“capacity – disk parts – disk formatting – data recording **floppy disk drive**** – capacity – installation and configuration – adding and removing disk drives. ****SDG 12: Responsible Consumption and Production**	K2, K3	6
III	**KEYBOARD AND MEMORY DEVICES** CDROM Types – **Audio, Video, DVD, Data CDS, Reading and writing mechanism Storage capacity**** – CD Drive Mechanisms Installation - PC Keyboard operation, the scan code concept – keyboards signals -- interface logic advanced KBD functions – Ctrl-Alt-Del, pause, print screen, Alt+numeric pad. ****SDG 9: Industry, Innovation, and Infrastructure**	K2, K3	6
IV	**INPUT AND OUTPUT DEVICES** The mouse – signals, connection, operation installation –	K3	6

	scanner types. **The print controller block diagram and description – ports****. The serial port – parallel port – game port – signals and connector specifications block diagram SMPS – operation, output voltage levels. ****SDG 11: Sustainable Cities and Communities**		
V	**INSTALLATION AND SERVICING** **Configuring the motherboard - all in one motherboard**** – jumper sets – identifying the connectors and cables – adding memory modules – upgrading the CPU – **BIOS setup 60 program**** – various setup options – configuring the IDE card. ****SDG 8: Decent Work and Economic Growth**	K3	6

Course Outcomes	**CO1:** Understand the architecture of a personal computer system including motherboard layout and internal hardware components.	K1, K2
	CO2: Identify and describe the role of storage devices such as floppy disks, hard disks, and their configurations.	K2, K3
	CO3: Explain the functioning and installation of keyboard, memory devices, and optical drives like CD/DVD.	K2, K3
	CO4: Analyze the functions of input/output devices including printers, monitors, ports, and SMPS.	K3
	CO5: Apply knowledge in configuring, installing, and servicing motherboards, BIOS, and diagnostic tools.	K3

Learning Resources	
Text Books	1. Computer hardware, K L James, Kindle Edition. 2. Essential Computer Hardware Second edition, Kavin Wilson, Elluminet Press, (2019) 3. Introduction to Microprocessors, Software, Hardware and programming-lance A 4. Leventhal, -prentice-Hall.of India (1979)
Reference Books	1. Microprocessors and Interfacing, programming mid-Hardware-second edition, Douglas.V. Hall, Tata Mc Graw Hill (1999). 2. Computer Architecture: A Quantitative Approach, John L. Hennessy, David A. Patterson. 3. Computer Hardware Troubleshooting Guide.
Website Links	1. https://www.youtube.com/watch?v=oEORcCQ62nQ&t=5s 2. https://www.youtube.com/watch?v=b2pd3Y6aBag 3. https://www.youtube.com/watch?v=d86ws7mQYIg&t=664s
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of COs with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	2	2	1	2	1	3	2	2
CO2	3	2	3	2	2	2	2	1	2	1	3	2	3
CO3	2	2	3	1	2	2	1	1	2	1	2	3	2
CO4	3	2	3	2	3	2	2	2	3	2	3	3	3
CO5	3	3	3	2	3	3	2	2	3	2	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. T. Sivapriya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr. B. K. Jaleesha	**Approved By: Dr. J. Caroline Rose Principal**

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Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.	**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH1NM1	**PHYSICS IN EVERYDAY LIFE**	**SEC / NME THEORY**	**I**	**30**	**2**	**-**	**-**	**2**

Objective:

To know where all physics principles have been put to use in daily life and appreciate the concepts with a better understanding also to know about Indian scientists who have made significant contributions to Physics.

Unit	Course Content	Knowledge Levels	Sessions
I	**MECHANICAL OBJECTS** **S**pring Scales – Bouncing Balls –Roller Coasters – Bicycles –**Rockets and Space Travel**.** ****SDG 4: Quality Education**	K1, K2, K3	6
II	**OPTICAL INSTRUMENTS AND LASER** **Vision Corrective Lenses**** – Polaroid Glasses – UV Protective Glass – Polaroid Camera – Colour Photography – Holography and Laser. ****SDG 3: Good Health & Well-Being**	K1, K2, K3	6
III	**PHYSICS OF HOME APPLIANCES** Bulb – Fan – Hair Drier – **Television – Air Conditioners**** – Microwave Ovens – Vacuum Cleaners ****SDG 12: Responsible Consumption & Production**	K1, K2, K3	6
IV	**SOLAR ENERGY** Solar Constant – General Applications of Solar Energy – Solar Water Heaters – **Solar Photo – Voltaic Cells**** – General Applications of Solar Cells. ****SDG 13: Climate Action**	K1, K2, K3	6
V	**INDIAN PHYSICIST AND THEIR CONTRIBUTIONS: C.V. Raman**, Homi Jehangir Bhabha, Vikram Sarabhai, Subrahmanyan Chandrasekhar, **Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam**** and their contribution to science and technology. ****SDG 17: Partnerships for the Goals**	K1, K2	6

Course Outcomes	**CO1:** Explain the scientific principles behind mechanical objects and analyze their applications in education and technology.	K1
	CO 2: Demonstrate understanding of optical instruments and lasers, and evaluate their role in healthcare, vision correction, and well-being	K2
	CO3: Apply physics concepts to the working of home appliances and promote responsible and sustainable energy usage.	K2
	CO4: Analyze solar energy systems, including solar water heaters and photovoltaic cells, and apply them to develop sustainable energy solutions.	K1

	CO5: Recognize and describe the life, achievements, and contributions of prominent Indian physicists to science and technology.	K3

Learning Resources	
Text Book	1. The Physics in our Daily Lives, Umme Ammara, Gugu cool Publishing, Hyderabad, 2019.
Reference Book	1. For the love of physics, Walter Lawin, Free Press, New York, 2011.
Website Links	1. https://www.youtube.com/watch?v=GY7oiZ19oeU 2. https://www.youtube.com/watch?v=Hu-JL2J6ncE 3. https://www.youtube.com/shorts/wxGGhdOL3I8
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	1	1	1	-	-	2	1	1	-	3	1	1
CO2	3	2	1	1	2	-	2	2	2	1	3	2	2
CO3	3	2	2	1	3	1	3	3	2	1	2	2	3
CO4	2	1	-	2	2	1	2	1	1	-	2	1	1
CO5	3	2	2	2	2	2	3	2	3	1	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Saranya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr. B. K. Jaleesha	**Approved By: Dr. J. Caroline Rose Principal**

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Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.	**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH1NM2	**SPACE SCIENCE**	**SEC / NME THEORY**	**I**	**30**	**2**	**-**	**-**	**2**

Objective:
To develop fundamental knowledge of the structure and composition of the universe, including planets, Earth's layers, atmospheric phenomena, and celestial objects such as comets, meteors, asteroids, the Sun, Moon, stars, and galaxies.

Unit	Course Content	Knowledge Levels	Sessions
I	Universe: Planets - interior planets - exterior planets - crust, mantle and core of the earth - different - **region of earth's atmosphere**** - rotation of the earth - magnetosphere - Van Allen belts - Aurora. ****SDG 13: Climate Action**	K1, K2	6
II	Comets, Meteors, Asteroids: Composition and structure of comets - **periodic comets – salient features of asteroids, meteors and its use**** ****SDG 9: Industry, Innovation & Infrastructure**	K1, K2	6
III	**Sun: Structure of photosphere, chromosphere, corona – sunspots**** – solar flares - solar prominences - solar piages - satellites of planets -structure, phases and their features of moon. ****SDG 3: Good Health & Well-Being**	K1, K2	6
IV	**Stars:** Constellations - binary stars - their origin and types star clusters –globular clusters - **types of variable stars - types of galaxies****. ****SDG 17: Partnerships for the Goals**	K1, K2	6
V	**Origin of Universe: Big bang theory**** - pulsating theory - steady state theory – composition of universe expansion ****SDG 4: Quality Education**	K1, K2	6

Course Outcomes	**CO1:** Recall the classification of planets, internal layers of the Earth, and different regions of the Earth's atmosphere.	K1
	CO2: Explain the phenomena related to Earth's rotation, magnetosphere, Van Allen belts, and aurora.	K2
	CO3: Describe the structure and physical features of comets, meteors, asteroids, and their significance in space science.	K2
	CO4: Understand the structure and characteristics of the Sun and the Moon, including their layers, activities (like solar flares), and lunar phases.	K2
	CO5: Identify different types of stars, galaxies, and theories related to the origin and expansion of the universe.	K1

Learning Resources	
Text Books	1. K.D. Abyankar, Astrophysics of the solar system, University press, India (1999) 2. BaidyanathBasu, Sudhindra Nath Biswas And Tanuka Chattopadhyay, An 3. Introduction ToAstrophysics, Prentice Hall OfIndia, New Delhi (2010)
Reference Books	1. Prof. P.Devadas, The fascinatingAstronomy, Devadas Telescopies, Chennai 2. R.P. Singhal, Elements of Space Physics, PHI, (2009)
Website Links	1. https://www.youtube.com/watch?v=TZaMh5H4zdw 2. https://www.youtube.com/watch?v=Pmajp_gN00w 3. https://www.youtube.com/watch?v=a2RsH_2-Oko 4. https://www.youtube.com/watch?v=k9xGkRx1pQc 5. https://www.youtube.com/watch?v=tBVUTFPate0
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of CO's with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	1	3	1	3	2	2	1	1	1	3	1	1
CO2	3	2	1	3	3	2	2	2	1	2	3	2	2
CO3	3	2	2	1	3	1	2	2	2	2	3	2	2
CO4	3	2	2	3	3	1	2	1	2	1	3	2	2
CO5	3	1	3	1	1	3	3	2	2	1	3	1	2

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. S. Saranya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr. B. K. Jaleesha	**Approved By: Dr. J. Caroline Rose Principal**

Dr. Kalyana Sundar, M.Sc., M.Phil., Ph.D., Assistant Professor Department of Physics, Periyar University Salem 11.	**Dr. M. Jose, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head (PG), PG & Research Department of Physics, Sacred Heart College (Autonomous), Tirupattur	**Dr. Pavithra, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head, PG & Research Department of Physics, Marudhar Kesari Jain College for Women (Autonomous), Vaniyambadi.
Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.	**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH2NM3	**RENEWABLE ENERGY SOURCES**	**SEC / NME THEORY**	**II**	**30**	**2**	**-**	**-**	**2**

Objectives:

To make the students understand the basic principles of real-time applications of nonconventional energy sources.

Unit	Course Content	Knowledge Levels	Sessions
I	**SOLAR ENERGY:** Solar energy Introduction– Solar radiation measurements – angstrom compensation Pyrheliometer- Solar water heater – Subcomponents of solar water heater – **Solar Cooker -Solar greenhouse - types of greenhouses**** ****SDG 7: Affordable and Clean Energy**	K1, K2	6
II	**WIND ENERGY:** Power in the wind - **Types of wind energy systems**** – Horizontal axis wind Turbine – Vertical axis wind Turbine**.** ****SDG 9: Industry, Innovation, and Infrastructure**	K1, K2	6
III	**OCEAN ENERGY:** Tidal Energy – **Ocean Thermal Energy Conversion (OTEC)**** – Closed Cycle OTEC system – Open Cycle OTEC System**.** ****SDG 14: Life Below Water**	K2	6
IV	**ENERGY FROM BIOMASS:** Biomass feedstock – water material – energy crops – important properties of biomass – **conversion of biomass to gaseous fuels** **– anaerobic digestion – thermal gasification**.** ****SDG 12: Responsible Consumption and Production**	K2	6
V	**GEOTHERMAL ENERGY** Introduction – Estimates of Geothermal power – Nature of Geothermal fields – **Geothermal sources**** – Advantages and Disadvantages of geothermal energy – Applications of geothermal energy. ****SDG 13: Climate Action**	K2	6

Course Outcomes	**CO1**: Understand the basic principles and importance of renewable energy sources like solar, wind, ocean, biomass, and geothermal energy.	K2
	CO2: Illustrate solar energy systems by explaining solar radiation measurements, and describe the working of solar water heaters, cookers, and greenhouses.	K3
	CO3: Differentiate between horizontal and vertical axis wind turbines and evaluate the performance of various wind energy systems.	K3
	CO4: Explain tidal energy and OTEC systems and compare the operations of open and closed cycle OTEC systems.	K3
	CO5: Examine the types, properties, and conversion methods of biomass and geothermal energy sources and assess their applications.	K2

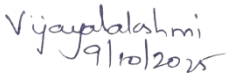
Learning Resources	
Text Books	1. Sukhatme S.P, Solar Energy, Wiley publications, 1975, 1st edition. 2. Rai. G.D, Non-Conventional Sources of Energy, Khanna Publishers, 2009, 1st edition. 3. Rai. G.D, Solar Energy Utilization, Khanna Publishers, 1987, 1st edition.
Reference Books	1. Yogi. D Goswami, Frank Kieth and Jan F. Kredler, Principles of Solar Engineering, Tailor & Francis, 2003, 1st edition. 2. H. C. Jain, Non-Conventional Sources of Energy, Sterling Publishers,1986. 3. M. P. Agarwal, Solar Energy, S. Chand & Co. Ltd., New Delhi,1982
Website Links	1. https://www.youtube.com/watch?v=KGnauw2Ckys 2. https://www.youtube.com/watch?v=qSWm_nprfqE 3. https://www.youtube.com/watch?v=81K84gY414c
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of COs with PO's and PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3	3	1	3	3	2	3	1	2	3	3	3
CO2	3	2	2	3	2	1	1	2	2	2	3	2	3
CO3	3	2	3	3	2	3	2	2	2	1	2	2	3
CO4	2	2	2	1	2	1	2	3	1	1	2	1	3
CO5	3	2	3	1	3	2	3	3	2	1	3	2	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. T. Sivapriya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr.B.K. Jaleesha	**Approved By: Dr. J. Caroline Rose Principal**

 **Dr. Kalyana Sundar, M.Sc., M.Phil., Ph.D.,** Assistant Professor Department of Physics, Periyar University Salem 11.	 **Dr. M. Jose, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head (PG), PG & Research Department of Physics, Sacred Heart College (Autonomous), Tirupattur	 **Dr. Pavithra, M.Sc., M.Phil., Ph.D.,** Associate Professor and Head, PG & Research Department of Physics, Marudhar Kesari Jain College for Women (Autonomous), Vaniyambadi.
 **Mr. R. Elavarasan, M.E.,** Managing Director, Pranav Solution, Krishnagiri.	 **Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur	

B.Sc. Physics LOCF – CBCS with effect from 2025 - 2026 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
25UPH2NM4	**ESSENTIAL OF ELECTRICITY**	**SEC / NME THEORY**	**II**	**30**	**2**	**-**	**-**	**2**

Objectives:

To understand the basic concepts of electrostatics, electric circuits, and energy sources. To apply knowledge of electrical laws, resistance, and circuit elements to analyze simple electric circuits and energy systems.

Unit	Course Content	Knowledge Levels	Sessions
I	Electrification by friction - two kinds of electricity - capacitor -principle of condenser - **types of condensers**** - fixed condenser -variable condenser. ****SDG 4: Quality Education**	K1, K2	6
II	Condenser boxes - electrolytic condenser - guard ring - condenser -**condenser in series - condensers in parallel****. ****SDG 8: Decent Work and Economic Growth**	K2, K2	6
III	Electric field - potential - **Ohm's law - electrical energy and power**** -resistance - types of resistance - fixed resistance - variable resistance. ****SDG 8: Decent Work and Economic Growth**	K1, K3	6
IV	Colour codes - resistance in series - resistance in parallel - **Kirchoff's law - application to Wheatstone's network**** ****SDG 17: Partnerships for the Goals**	K2, K3	6
V	Primary cell - Daniel, Lechlanche, Dry cell - Secondary cell - **Lead acid, Nickel (Principle only) - Cadmium cell**** - rechargeable cell. ****SDG 12: Responsible Consumption and Production**	K1, K2	6

Course Outcomes	**CO1:** Recall the fundamental concepts of electrification, capacitors, electric field, and resistance.	K1
	CO2: Explain the working principles of capacitors, types of cells, Ohm's law, and Kirchhoff's laws.	K2
	CO3: Apply electrical principles to analyze circuits involving resistances, condensers, and energy sources.	K3
	CO4: Distinguish between different types of cells, resistors, and condensers for practical applications.	K3
	CO5: Evaluate the performance and design considerations of complex circuits using Kirchhoff's laws and circuit combinations.	K3

Learning Resources	
Text Books	1. Brijlal and Subramaniam, Electricity and Magnetism, S. Chand & Co, New Delhi (2016) 2. R. Murugeshan, Electricity and Magnetism, S. Chand & Co, New Delhi (2016)
Reference Books	1.D. N. Vasudeva, Electricity and Magnetism, S. Chand & Co, New Delhi (2016) 2. K. K. Tewari, Electricity and Magnetism, S. Chand & Co, New Delhi (2016)
Website Links	1.https://www.youtube.com/watch?v=5lR5nf3gR8c 2.https://www.youtube.com/watch?v=ZDoyIghUI44 3.https://www.youtube.com/watch?v=kYNy_bx4TBA&t=13s
L – Lecture T – Tutorial P – Practical C - Credit	

Mapping of COs with PO's and PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	1	2	1	1	2	1	1	1	2	3	1	1
CO2	3	2	2	1	2	2	2	1	2	1	3	2	2
CO3	3	3	3	2	2	1	2	2	3	2	3	3	2
CO4	2	2	2	1	1	1	2	1	2	1	2	2	3
CO5	3	3	3	2	2	2	2	2	3	2	3	3	3

(Correlation: 3 – High, 2 – Medium, 1 – Low)

Course Designed By: Mrs. T. Sivapriya	**Verified By HOD: Mrs. T. Sivapriya**
Checked By CDC: Dr.B.K. Jaleesha	**Approved By: Dr.J. Caroline Rose Principal**

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Mr. R. Elavarasan, M.E., Managing Director, Pranav Solution, Krishnagiri.		**Ms. D. Vijaya Lakshmi M.Sc.,** Chief Operator, Tata Electronics, Hosur