ABOUT THE DEPARTMENT

The Department of Physics was started in the year 1967. Pre– University course was introduced in the college for the students who studied Physics as Ancillary subject. There were tutors and demonstrators for teaching the theory and practical. Later on the department was upgraded with B.Sc (Physics) Major course in the year 1980 in the college. Since then the department has been offering the course to cater the academic needs and aspiration of first generation learners belonging to educationally, socially and economically backward sections and maintains its standards of academic excellence.

VISION

- To impart quality education both in theoretical as well as experimental Physics with special emphasis on "learning by doing"
- To build a foundation for excellence and encourage the development of the institution

MISSION

The Mission of the Department is to awaken the young minds and discover their talents in theory and in practical Physics, through dedication to teach, commitment towards students and innovative instructional methods like PPT and Visual aids.

GRADUATE ATTRIBUTES

1. **(KB) A knowledge base for Physics**: Demonstrated competence in university level mathematics, natural sciences, Physics fundamentals, and specialized Physics knowledge appropriate to the program.
2. **(PA) Problem analysis**: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex Physics problems in order to reach substantiated conclusions
3. **(Inv.) Investigation**: An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data and synthesis of information in order to reach valid conclusions.
4. **(Des.) Design:** An ability to design solutions for complex, open–ended Physics problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
5. **(Tools) Use of Physics tools**: An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern Physics tools to a range of Physics activities, from simple to complex, with an understanding of the associated limitations.
6. **(Team) Individual and teamwork**: An ability to work effectively as a member and leader in teams, preferably in a multi–disciplinary setting.
7. **(Comm.) Communication skills**: An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.
8. **(Prof.) Professionalism**: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.
9. **(Impacts) Impact of Physics on society and the environment**: An ability to analyze social and environmental aspects of Physics activities. Such ability includes an understanding of the interactions that Physics has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.
10. **(Ethics) Ethics and equity**: An ability to apply professional ethics, accountability, and equity.
11. **(Econ.) Economics and project management**: An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of Physics and to understand their limitations.
12. **(LL) Life–long learning**: An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The B.Sc Physics Graduates of the Sourashtra College will:

PEO 1	possess fundamental knowledge of Physics and able to transfer and apply the acquired phenomena and principles to learn different branches of Physics.
PEO 2	realise and develop an understanding of the impact of Physics and Science on Society.
PEO 3	report the solutions to Physics problems and experimental studies either orally or in written format
PEO 4	motivate to pursue PG courses in reputed institutions and to kindle the interest for research in students.
PEO 5	equip with creative and analytical skills that will enrich them to participate in co– curricular and extra – curricular activities
PEO 6	have leadership skills, can act sensitively to recent issues and play a positive role for the benefit of the society.

UNDERGRADUATE (UG) PROGRAMME OUTCOMES (POs)

Undergraduate (B.A., **B.Sc.,** B.Com., B.C.A., B.B.A., etc.,) is a 3 – year degree Programme with 6 semesters consisting the following Programme Outcomes (POs) under various criteria including critical thinking, problem solving, effective communication, societal/ citizenship/ ethical credibility, sustainable growth and employable abilities.

PO 1	**Critical Thinking**: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO 2	**Problem Solving**: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO 3	**Effective Communication**: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO 4	**Societal/ Citizenship/ Ethical Credibility**: Realization of various value systems/ moral dimensions and demonstrate the empathetic social concern as well as equity in all the decisions, executions and actions.
PO 5	**Environmental Concern and Sustainable Growth**: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO 6	**Skill Development and Employable Abilities**: Adequate training in relevant skill sector and creating employable abilities among the under graduates.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **B.Sc. PHYSICS Programme**, the students are expected /will be able to

PSO 1	acquire core knowledge in Physics, including major areas of Classical Mechanics, Quantum Mechanics, Electromagnetism, Optics, Electronics, Modern Physics, Thermal physics and Mathematical methods.
PSO 2	develop the proficiency in the acquisition of data using a variety of laboratory instruments and in the analysis and interpretation of such data.
PSO 3	learn laboratory skills enabling them to take measurements in Physics laboratory and analyze the measurements to draw valid conclusion.
PSO 4	be capable of oral and written scientific communication and will prove that they can think critically and work independently.
PSO 5	realize and develop an understanding of the impact of Physics and science on society.
PSO 6	discover Physics concepts in other disciplines such as Mathematics, Computer Science, Chemistry etc.,

DISTRIBUTION OF CREDITS (UG PROGRAMME)

Part	Semester	Courses	No. of. Courses	Hrs.	Credits	Total Credits
I	**I– IV**	Language	**4**	**6**	**3**	**12**
II	**I– 1V**	English	**4**	**6**	**3**	**12**
III	**1– VI**	Core	**17**	**4/5/3**	**4/5/2**	**57**
	I– VI	Elective and Elective/Allied	**10**	**2/4/ 5/6**	**2/3/ 4/5**	**38**
IV	**I– II**	SEC (Non Major Elective)	**2**	**2**	**2**	**4**
	I	Foundation Course FC	**1**	**2**	**2**	**2**
	II– IV	SEC (Discipline Specific/ Generic)	**5**	**2/1**	**2/1**	**9**
	IV	EVS(Environmental Studies)	**1**	**2**	**2**	**2**
	V	Value Education	**1**	**2**	**2**	**2**
	IV	Internship	**1**	**–**	**2**	**2**
V	**IV**	Extension Activity	**1**	**–**	**1**	**1**
	V	Soft Skills (Self – Study)	**1**	**–**	**1**	**1**
	VI	General Knowledge (online) (Self – Study)	**1**	**–**	**1**	**1**
Additional credit will be given to any Online Course taken in SWAYAM Portal						
		Total				**143**

SOURASHTRA COLLEGE, MADURAI – 625004

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B.Sc. PHYSICS – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025-2026 onwards)

B.Sc. PHYSICS

COURSE STRUCTURE – I SEMESTER

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT11	I	**Tamil** – பொதுத் தமிழ் – I	6	3	25	75	100	3
	25UACH11		**Hindi** – General Hindi – I						
	25UACS11		**Sanskrit** – Poetry, Grammar and History of Sanskrit Literature						
2	25UACE11	II	**English** – General English – I	6	3	25	75	100	3
3	25UPSC11	III	**Core – 1:** Properties of Matter and Acoustics	5	3	25	75	100	5
4	25UPSCP1		**Core – 2:** Core Practical – I	3	3	40	60	100	2
5	25UMSA11		**Elective/Allied(M) – 1:** Allied Mathematics – I	6	3	25	75	100	5
7	25UPSN11	IV	**SEC – 1: NME:** Physics of Everyday Life	2	3	25	75	100	2
8	25UPSF11		**Foundation Course :** Introductory Physics	2	3	25	75	100	2
			TOTAL	**30**				**800**	**22**

II – SEMESTER

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT21	I	**Tamil** – பொதுத் தமிழ் – II	6	3	25	75	100	3
	25UACH21		**Hindi** – General Hindi – II						
	25UACS21		**Sanskrit** – Prose, Grammar and History of Sanskrit Literature						
2	25UACE21	II	**English** – General English – II	6	3	25	75	100	3
3	25UPSC21	III	**Core – 3:**Heat, Thermodynamics and Statistical Physics	5	3	25	75	100	5
4	25UPSCP2		**Core – 4:** Core Practical – II	3	3	40	60	100	2
5	25UMSA21		**Elective/Allied(M) – 2:** Allied Mathematics – II	6	3	25	75	100	5
7	25UPSN21	IV	**SEC – 2: NME:** Space Physics	2	3	25	75	100	2
8	25UPSS21		**SEC – 3:DS**: Programming in C	2	3	25	75	100	2
			TOTAL	**30**				**800**	**22**

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COURSE STRUCTURE – I SEMESTER

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT11	I	**Tamil** – பொதுத் தமிழ் – I	6	3	25	75	100	3
	25UACH11		**Hindi** – General Hindi – I						
	25UACS11		**Sanskrit** – Poetry, Grammar and History of Sanskrit Literature						
2	25UACE11	II	**English** – General English – I	6	3	25	75	100	3
3	25UPSC11	III	**Core – 1:** Properties of Matter and Acoustics	5	3	25	75	100	5
4	25UPSCP1		**Core – 2:** Core Practical – I	3	3	40	60	100	2
5	25UMSA11		**Elective/ Allied(M) – 1:** Allied Mathematics – I	6	3	25	75	100	5
7	25UPSN11	IV	**SEC - 1: NME:** Physics of Everyday Life	2	3	25	75	100	2
8	25UPSF11		**Foundation Course:** Introductory Physics	2	3	25	75	100	2
			TOTAL	**30**				**800**	**22**

SEC – Skill Enhancement Course

DS – Discipline/ Subject Specific

CA – Class Assessment (Internal)

SE – Summative Examination

SEC – Skill Enhancement Course

NME – Non –Major Elective

M – Mathematics

C – Chemistry

Passed in the BoS Meeting held on 27/02/2025 **Signature of the Chairman**

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSC11	PROPERTIES OF MATTER AND ACOUSTICS	CORE – 1	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course helps to know about the elastic properties of materials, viscous properties of liquid, nature of sound, transformations and applications.

COURSE OBJECTIVES:

The primary objective of this course is to study the properties of matter that leads to information which is of practical value to both the physicist and the engineers and to expose students the fundamentals of properties of matter and sound.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	identify the materials suitable for construction of buildings, based on the moduli of elasticity	Upto K3
CO 2	able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials.	Upto K3
CO 3	know the viscous properties of liquids and create knowledge about how different liquids utilized in various mechanisms.	Upto K3
CO 4	develop the simple harmonic motions mathematically and apply them. understand the concept of resonance and use it to evaluate the frequency of vibration. setup experiment to evaluate frequency of ac mains.	Upto K3
CO 5	understand the concepts of acoustics and apply the theories used in building acoustics	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

PROPERTIES OF MATTER AND ACOUSTICS

UNIT – I: ELASTICITY

Hooke's law–Stress– strain diagram – Elastic constants – 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)

UNIT – 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– Theory of Non– uniform bending– Experiment to determine Young's modulus by scale and telescope method–Uniform bending–Expression for elevation–Experiment to determine Young's modulus using pin and Microscope.

UNIT – III: FLUID DYNAMICS

Surface tension: Definition – Molecular forces– Excess pressure over curved surface – Determination of surface tension by Jaeger'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–Terminal velocity and Stoke's formula–Variation of viscosity with temperature.

UNIT – 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–

Laws of transverse vibration in strings –Sonometer – Determination of AC frequency using Sonometer– Determination of frequency using Melde's string apparatus.

UNIT – 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.

Ultrasonicwaves: Production of ultrasonic waves–Piezo electric crystal method – Magneto striction effect – Application of ultrasonic waves.

TEXT BOOKS:

1. D.S. Mathur, 2010, ***Elements of Properties of Matter***, S.Chand&Co.
2. Brij Lal& N. Subrahmanyam, 2003, ***Properties of Matter***, S.Chand&Co
3. D.R. Khanna&R.S.Bedi,1969,***Text book of Sound***,AtmaRam&sons
4. BrijLalandN.Subrahmanyam, 1995, ***A Text Book of Sound***, Second revised edition,Vikas Publishing House.
5. R.Murugesan, 2012, ***Properties of Matter***, S.Chand & Co.

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.PFrench, 1973, ***Vibration and Waves, MIT Introductory Physics***, Arnold–Heinmann India.

DIGITAL TOOLS:

- https://www.biolinscientific.com/blog/what– are– surfactants– and– how– do– they– work
- http://hyperphysics.phy– astr.gsu.edu/hbase/permot2.html
- https://www.youtube.com/watch?v=gT8Nth9NWPM
- https://learningtechnologyofficial.com/category/fluid– mechanics– lab/
- http://www.sound– physics.com/
- http://nptel.ac.in/courses/112104026/

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	2	1	2
CO2	2	3	3	2	1	1
CO3	2	3	3	2	1	1
CO4	2	3	3	1	2	2
CO5	2	2	2	2	2	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSCP1	CORE PRACTICAL – 1	CORE – 2	–	3	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	40	60	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course explains the various concepts of Physics and provides hands–on learning experience in measuring the concepts that are learnt theoretically can solve problems related to it practically.

COURSE OBJECTIVES:

The main aim of this course is to apply various physics concepts to understand Properties of Matter, setup experimentation to verify theories, to do error analysis and correlate results.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	gain the knowledge of experiments related to properties of matter and sound.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

LIST OF EXPERIMENTS

(Any Six experiments from the following)

1. Determination of rigidity modulus with and without mass using Torsional pendulum.
2. Determination of Young's modulus by uniform bending– Pin and microscope.
3. Determination of Young's modulus by non– uniform bending–scale & telescope.
4. Determination of Young's modulus by cantilever– load depression graph..
5. Determination of surface tension & interfacial surface tension by drop weight method.
6. Determination of co– efficient of viscosity by Stokes' method–terminal velocity.
7. Determination of viscosity by Poiseuille's flow method.
8. Determination of g using compound pendulum.

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSA11	ALLIED PHYSICS– I	ELECTIVE/ ALLIED	4	–	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship					
	National		Local	✓	Regional	✓	Global					
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓		

COURSE DESCRIPTION:

This course helps to understand the working of heat engines and thermodynamic efficiency and to apply the skills of Digital systems to real life systems.

COURSE OBJECTIVES:

The objective of this course is to impart the fundamental principles of Physics which would be useful for the students who have taken programmes other than Physics.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	develop the simple harmonic motions mathematically and apply them and setup experiment to evaluate frequency of ac mains	Upto K3
CO 2	able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials and know the viscous properties of liquids and creating knowledge about how different liquids utilized in various mechanism.	Upto K3
CO 3	acquire knowledge on low temperature physics and derive the efficiency of the carnot's engine and discuss the of laws of thermodynamics	Upto K3
CO 4	understand the concepts and laws of current electricity and correlate the connection between electric field and magnetic field	Upto K3
CO 5	understand the basics of diodes and transistors and solve the problems in the binary number system and analyze the logic circuits and acquire information about various govt. programs/ institutions in this field.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

ALLIED PHYSICS– 1

UNIT – I: WAVES, OSCILLATIONS AND ULTRASONICS

Simple harmonic motion (SHM) – Composition of two SHMs at right angles (periods in the ratio 1:1) – Lissajous figures – Uses – Laws of transverse vibrations of strings – Determination of AC frequency using sonometer (steel and brass wires) – Ultrasound – Production – Piezoelectric method – Application of ultrasonics: medical field .

UNIT – II: PROPERTIES OF MATTER

Elasticity: Elastic constants – Bending of beam – Theory of non– uniform bending – Determination of Young's modulus by non– uniform bending pin and microscope method – Theory of Torsion pendulum – Determination of rigidity modulus by torsional pendulum.
***Viscosity*:** Streamline and turbulent motion – Critical velocity – Coefficient of viscosity – Poiseuille's formula – Comparison of viscosities – Burette method.

UNIT – III: HEAT AND THERMODYNAMICS

Joule– Kelvin effect – Joule– Thomson porous plug experiment – Theory – Temperature of inversion – Liquefaction of Oxygen– Linde's process of liquefaction of air–Thermodynamic system – Thermodynamic equilibrium – Laws of thermodynamics – Heat engine – Carnot's cycle – Efficiency – Entropy – Change of entropy in reversible and irreversible process.

UNIT – IV: ELECTRICITY AND MAGNETISM

Potentiometer – Principle – Measurement of thermo emf using potentiometer –Magnetic field due to a current carrying conductor – Biot– Savart's law – Field along the axis of the coil carrying current – Peak, average and RMS values of ac current and voltage – Power factor and current values in an AC circuit .

UNIT – V: DIGITAL ELECTRONICS AND DIGITAL INDIA

Logic gates, OR, AND, NOT, NAND, NOR , EXOR logic gates – Universal building blocks – Boolean algebra – De Morgan's theorem – Verification — Semiconductor laboratories under Dept. of Space – An introduction to Digital India

TEXT BOOKS:

1. R. Murugesan (2001), ***Allied Physics***, S. Chand & Co., New Delhi.
2. Brijlal and N. Subramanyam (1994), ***Waves and Oscillations***, Vikas Publishing House, New Delhi.
3. Brijlal and N. Subramaniam (1994), ***Properties of Matter***, S. Chand & Co.,NewDelhi.
4. J.B. Rajam and C.L. Arora (1976). ***Heat and Thermodynamics*** (8^{th} edition), S.Chand&Co., New Delhi.
5. A. Subramaniyam, ***Applied Electronics*** 2^{nd}Edn., National Publishing Co.,Chennai.

REFERENCE BOOKS:

1. Resnick Halliday and Walker (2018).***Fundamentals of Physics*** (11th edition), John Willey and Sons, Asia Pvt. Ltd., Singapore.
2. V.R. Khanna and R.S. Bedi (1998), ***Textbook of Sound*** 1st Edn. Kedharnaath Publish & Co, Meerut.
3. N.S. Khare and S.S. Srivastava (1983), ***Electricity and Magnetism*** 10th Edn.,Atma Ram & Sons, New Delhi.
4. V.K.Metha (2004).***Principles of electronics*** 6th Edn. S. Chand and company.

DIGITAL TOOLS:

- https://youtu.be/M_5KYncYNyc
- https://youtu.be/ljJLJgIvaHY
- https://youtu.be/7mGqd9HQ_AU
- https://youtu.be/h5jOAw57OXM
- https://learningtechnologyofficial.com/category/fluid– mechanics– lab/

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	2	1	2
CO2	3	3	3	1	1	1
CO3	3	3	3	2	2	2
CO4	3	3	3	2	1	1
CO5	3	3	3	1	2	2

3. Advanced Application 2.Intermediate Development 1. Introductory Level

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B.Sc. PHYSICS – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025-2026 onwards)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSAP1	ALLIED PRACTICAL – 1	ELECTIVE/ ALLIED	–	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	40	60	100

Curriculum Design and Development	Employability			Skill Oriented	✓	Entrepreneurship					
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course helps understand the various concepts of Physics and covers experiments related to properties of matter, sound electricity and electronics

COURSE OBJECTIVES:

The main aim of this course is to acquire practical knowledge from related theory.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	gain the knowledge of experiments related to properties of matter, sound electricity and electronics.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

LIST OF EXPERIMENTS

(Any Six experiments from the following)

1. Young's modulus by non– uniform bending using pin and microscope.
2. Young's modulus by non– uniform bending using optic lever, scale and telescope.
3. Rigidity modulus by torsional oscillations without mass.
4. Surface tension – drop weight method.
5. Verification of laws of transverse vibrations using Sonometer.
6. Calibration of low range voltmeter using potentiometer.
7. Verification of DeMorgan's theorems using logic gate ICs.
8. Use of NAND as Universal Building Block.

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COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSN11	PHYSICS OF EVERYDAY LIFE	SEC – 1 NME	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

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

COURSE OBJECTIVES:

The objective is to learn the working principle of home appliances, mechanical objects, applications of optical instruments and about the solar photovoltaic systems.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the working of bouncing balls, roller coasters, bicycles, rocket and space travel	Upto K3
CO 2	explain the working and application of optical instruments.	Upto K3
CO 3	elaborate the working of home appliances.	Upto K3
CO 4	realize the working principles of photo voltaic for solar energy conversion	Upto K3
CO 5	illustrate the notable contribution of Indian scientists to the global advancement of science.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

PHYSICS OF EVERYDAY LIFE

UNIT – I: MECHANICAL OBJECTS

Spring scales –bouncing balls–roller coasters– rockets and space travel.

UNIT – II: OPTICAL INSTRUMENTS AND LASER

Vision corrective lenses–Polaroid glasses–UV protective glass–Polaroid camera– colour photography– holography and laser.

UNIT – III: PHYSICS OF HOME APPLIANCES

Bulb–fan–hair drier–television–air conditioners–microwave ovens– vacuum cleaners

UNIT – IV: SOLAR ENERGY

Solar constant – General applications of solar energy–Solar water heaters–General applications of solar cells.

UNIT – V: INDIAN PHYSICISTS 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.

TEXT BOOKS:

1. ***The Physics in our Daily Lives***, Umme Ammara, Gugucool Publishing, Hyderabad, 2019.
2. ***For the Love of Physics***, Walter Lawin, Free Press, New York, 2011.

REFERENCE BOOK:

Sears, Zemansky, Hugh D. Young, Roger A. Freedman, 2021, ***University Physics with Modern Physics*** 15th Edition, Pearson.

DIGITAL TOOLS:

- https://www.youtube.com/watch?v=rLiW168r2oI
- https://blog.pitsco.com/blog/how– do– bicycles– work– the– science– behind– this– simple– machine
- https://www.grc.nasa.gov/www/k– 12/rocket/TRCRocket/rocket_principles.html
- https://www.revantoptics.com/blogs/the– lens/how– do– polarized– sunglasses– work
- https://www.scienceabc.com/innovation/how– do– polaroid– pictures– work– instant– color– films.html
- https://www.oreilly.com/library/view/engineering– physics/9788131775073/xhtml/ch12– sub12.2.xhtml#:~:text=In%20the%20holographic%20plate%2C%20both,is%20the%20principle%20of%20holography.
- https://engineeringstuff.co.in/what– is– electric– fan– how– electric– fan– works/
- https://electronics.howstuffworks.com/tv.htm
- https://www.youtube.com/watch?v=kp33ZprO0Ck
- https://www.youtube.com/watch?v=L_q6LRgKpTw

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	1	1	2
CO2	2	3	3	2	1	2
CO3	3	3	3	2	2	1
CO4	2	3	3	1	1	2
CO5	2	1	1	3	3	3

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSFC1	INTRODUCTORY PHYSICS	FOUNDATION COURSE	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	I	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓	Entrepreneurship					
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course can act as bridge between the school curriculum and the degree programme and helps the students to apply concepts of vectors, differentiate various types of motion and relate different properties of matter.

COURSE OBJECTIVES:

The objective of this course is to help students get an overview of Physics before learning their core courses and bridge the gap in understanding of basic concepts in physics with practical applications.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand experimental techniques and errors in measurement while applying concepts of error analysis to experimentation techniques	Upto K3
CO 2	appreciate different forces present in nature while learning about phenomena related to these different forces while also learning about vectors and manipulation with vectors.	Upto K3
CO 3	quantify energy in different process and relate momentum, velocity and energy	Upto K3
CO 4	differentiate different types of motions they would encounter in various courses and understand their basics	Upto K3
CO 5	relate various properties of matter with their behavior and connect them with different physical parameters involved.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

INTRODUCTORY PHYSICS

UNIT – I:

Significant figures – Setting up of an experiment – Instrument – Least count and precision – systematic errors and random errors –eliminating systematic errors and minimizing random errors– error propagation–standard deviation about the mean–techniques for plotting graphs–error plots.

UNIT – II:

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– Different types of forces–gravitational, electrostatic, magnetic, electromagnetic, nuclear–mechanical forces like, centripetal, centrifugal, friction, tension, cohesive, adhesive forces.

UNIT – III:

Different forms of energy–conservation laws of momentum, energy–types of collisions–angular momentum–alternate energy sources–real life examples.

UNIT– IV:

Types of motion– linear, projectile, circular, angular, simple harmonic motions–satellite motion–banking of a curved roads –streamlined and turbulent motions–wave motion–comparison of light and sound waves–free, forced, damped oscillations.

UNIT– 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.

TEXT BOOKS:

1. D.S.Mathur,2010, ***Elements of Properties of Matter***, S. Chand &Co
2. Brij Lal & N. Subrahmanyam, 2003, ***Properties of Matter***, S. Chand & Co.

REFERENCE BOOK:

H.R. Gulati, 1977, ***Fundamental of General Properties of Matte***r, Fifthedition, S. Chand & Co

DIGITAL TOOLS:

- http://hyperphysics.phy– astr.gsu.edu/hbase/permot2.html
- https://science.nasa.gov/ems/
- https://eesc.columbia.edu/courses/ees/climate/lectures/radiation_hays/

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	2	2
CO2	3	2	2	1	1	2
CO3	2	1	1	1	2	1
CO4	3	3	3	2	1	2
CO5	3	3	3	1	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE STRUCTURE – II SEMESTER

S. No.	Course Code	Part	Course Title	Hrs. / Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1	25UACT21	I	**Tamil** – பொதுத் தமிழ் – II	6	3	25	75	100	3
	25UACH21		**Hindi** – General Hindi – II						
	25UACS21		**Sanskrit** – Prose, Grammar and History of Sanskrit Literature						
2	25UACE21	II	**English** – General English – II	6	3	25	75	100	3
3	25UPSC21	III	**Core – 3:** Heat, Thermodynamics and Statistical Physics	5	3	25	75	100	5
4	25UPSCP2		**Core – 4:** Core Practical – II	3	3	40	60	100	2
5	25UMSA21		**Elective/ Allied(M) – 2:** Allied Mathematics - II	6	3	25	75	100	5
7	25UPSN21	IV	**SEC – 2 :NME:** Space Physics	2	3	25	75	100	2
8	25UPSS21		**SEC – 3:DS:** Programming in C	2	3	25	75	100	2
			TOTAL	**30**				**800**	**22**

SEC – Skill Enhancement Course

DS – Discipline/ Subject Specific

CA – Class Assessment (Internal)

SE – Summative Examination

SEC – Skill Enhancement Course

NME – Non –Major Elective

M – Mathematics

C – Chemistry

Passed in the BoS Meeting held on 27/02/2025 **Signature of the Chairman**

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSC21	HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS	CORE – 3	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓			Entrepreneurship			
	National		Local	✓	Regional	✓		Global			
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course provides detail concept of transmission of heat in good and bad conductors, relate the laws of thermodynamics, entropy in everyday life and explore the knowledge of statistical mechanics and its relations

COURSE OBJECTIVES:

The main objective of this course is to understand the theory of low temperature physics, working principle of different engines, various modes of heat transformation and thermo dynamical statistics

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	identify the relation between specific heat capacities of constant pressure and volume and acquire knowledge on and low temperature physics	Upto K3
CO 2	derive the efficiency of the Carnot's engine and discuss the implications of laws of thermodynamics in petrol and diesel engine	Upto K3
CO 3	understand the concept of entropy and derive the Maxwell's thermodynamic relation	Upto K3
CO 4	discuss various modes of heat transfer and realize knowledge about black body radiation	Upto K3
CO 5	know about the concepts of classical and quantum statistics and their comparison	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS

UNIT – I: CALORIMETRY

Specific heat capacity – specific heat capacity of gases C_p & C_v– Meyer's relation – Joly's method for determination of C_v – Regnault's method for determination of C_p.

Low Temperature Physics: Joule– Kelvin effect – porous plug experiment – Joule–Thomson effect –Boyle temperature – temperature of inversion (No Derivation) – liquefaction of gas by Linde's Process – Application of Low temperature physics.

UNIT – II: THERMODYNAMICS– I

Zeroth law and first law of thermodynamics – Isothermal and adiabatic process– P– V diagram – heat engine –efficiency of heat engine – Carnot's engine– construction, working and efficiency of petrol engine and diesel engine –comparison of engines

UNIT – III: THERMODYNAMICS– II

Second law of thermodynamics –entropy of an ideal gas – entropy change in reversible and irreversible processes – Maxwell's thermo dynamical relations –Clasius – Clapeyron's equation (first latent heat equation) – third law of thermodynamics – unattainability of absolute zero.

UNIT – 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 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.

UNIT – V: STATISTICAL MECHANICS

Definition of phase– space – micro and macro states –classical and quantum Statistics – Maxwell– Boltzmann statistics – expression for distribution function – Bose– Einstein statistics – expression for distribution function – Fermi– Dirac statistics –expression for distribution function – comparison of three statistics

TEXT BOOKS:

1. Brijlal & N. Subramaniam, 2000, ***Heat and Thermodynamics***, S. Chand & Co.
2. Narayanamoorthy & Krishna Rao, 1969 **,** ***Heat***, Triveni Publishers,Chennai.
3. 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***, 26thEdition, S. Chand & Co.
4. Resnick, Halliday&Walker,2010, ***Fundamentals of Physics***, 6thEdition.
5. Sears, Zemansky, Hugh D. Young, Roger A. Freedman, 2021 ***University Physics with Modern Physics*** 15th Edition, Pearson

DIGITAL TOOLS:

- https://youtu.be/M_5KYncYNyc
- https://www.youtube.com/watch?v=4M72kQulGKk&vl=en

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	2	3
CO2	3	1	1	1	3	3
CO3	3	2	2	1	3	3
CO4	3	3	3	2	3	2
CO5	3	1	1	1	1	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'A' grade by NAAC)

B.Sc. PHYSICS – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025-2026 onwards)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSCP2	CORE PRACTICAL – II	CORE – 4	–	3	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	40	60	100

Curriculum Design and Development	Employability			Skill Oriented	✓	Entrepreneurship					
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course helps to understand the various concepts of physics. This course covers experiments related to heat and thermodynamics and sound.

COURSE OBJECTIVES:

- to apply various Physics concepts
- to understand concepts of heat and thermodynamics and sound and
- to set up experiment to verify theories and analyze the results.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO	gain the knowledge of experiments related to heat and thermodynamics and sound.	Up to K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

LIST OF EXPERIMENTS

Any Six experiments:

1. Determination of specific heat by cooling – graphical method.
2. Determination of thermal conductivity of bad conductor by Lee'sdisc method.
3. Helmholtz resonator.
4. Velocity of sound through a wire using Sonometer.
5. Determination of frequency of an electrically maintained tuning fork using Melde's apparatus
6. To verify the laws of transverse vibration using Sonometer.
7. To compare the mass per unit length of two strings using Melde'sapparatus.
8. Frequency of AC by using Sonometer.

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSA21	ALLIED PHYSICS – II	ELECTIVE/ ALLIED	4	–	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability			Skill Oriented		✓	Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course provides the detailed understanding of the properties of light in physical optics, the various models in atomic and nuclear physics, concepts of special theory of relativity and the working and characteristics of semiconducting devices.

COURSE OBJECTIVES:

The main objective of this course is to provide basic ideas and explores the concepts of optics, atomic and nuclear physics, relativity, gravitational waves and semiconductor physics.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the important phenomena namely interference, diffraction and polarization of light	Upto K3
CO 2	describe the characteristics of Bohr atom model and discuss the effects of electric field and magnetic field on atomic spectra.	Upto K3
CO 3	identify the properties of nucleus, understand laws of radioactivity and the fission and fusion reactions.	Upto K3
CO 4	understand the basic principles of special theory of relativity.	Upto K3
CO 5	know about the functions and characteristics of diodes and transistors.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

ALLIED PHYSICS – II

UNIT – I: OPTICS

Interference – interference in thin films –colors of thin films – air wedge – determination of diameter of a thin wire by air wedge – diffraction –normal incidence – experimental determination of wavelength using diffraction grating (no theory) – polarization – polarization by double reflection – Brewster's law – optical activity

UNIT – II: ATOMIC PHYSICS

Introduction – Atom models – Bohr atom model – mass number – atomic number – nucleons – vector atom model – Pauli's exclusion principle –Bohr magnetron – Stark effect –Zeeman effect (elementary ideas only) – photo electric effect – Einstein's photoelectric equation – applications of photoelectric effect: solar cells.

UNIT – III: NUCLEAR PHYSICS

Introduction – Nuclear models – liquid drop model – magic numbers – nuclear energy – mass defect – binding energy – radioactivity – uses – half life – mean life – radio isotopes and uses – nuclear fission – energy released in fission –atom bomb – nuclear fusion – thermonuclear reactions – differences between fission and fusion.

UNIT – IV: INTRODUCTION TO RELATIVITY AND GRAVITATIONAL WAVES

Frame of reference – postulates of special theory of relativity – Galilean transformation equations – Lorentz transformation equations – derivation – length contraction – time dilation – twin paradox – mass– energy equivalence.

UNIT – V: SEMICONDUCTOR PHYSICS

p– n junction diode – forward and reverse biasing – characteristic of diode – zener diode – characteristic of zener diode – voltage regulator – bridge rectifier – construction and working – advantages (no mathematical treatment) –Transistor– PNP– NPN – working– CE amplifier– frequency response curve.

TEXT BOOKS:

1. R. Murugesan (2005), ***Allied Physics***,S.Chand and Co, New Delhi.
2. K. Thangaraj and D. Jayaraman (2004), ***Allied Physics***, Popular Book Depot, Chennai.
3. Brijlal and N. Subramanyam (2002), ***Text book of Optics***, S. Chand and Co, New Delhi.
4. R.Murugesan (2005), ***Modern Physics***, S. Chand and Co, New Delhi.
5. A.Subramaniyam ***Applied Electronics***, 2nd Edn., National Publishing Co.,Chennai.

REFERENCE BOOKS

1. Resnick Halliday and Walker (2018), ***Fundamentals of Physics***, 11thEdn.,John Willey and Sons, Asia Pvt. Ltd., Singapore.
2. D.R. Khanna and H.R.Gulati (1979).***Optics***, S. Chand and Co. Ltd., New Delhi.
3. A. Beiser (1997), ***Concepts of Modern Physics***, Tata McGraw Hill Publication, New Delhi.
4. Thomas L. Floyd (2017), ***Digital Fundamentals***, 11th Edn., Universal Book Stall, New Delhi.
5. V.K. Metha (2004), ***Principles of Electronics***, 6thEdn. ,S. Chand and Company, New Delhi.

DIGITAL TOOLS:

- https://www.youtube.com/watch?v=JrRrp5F– Qu4
- https://www.validyne.com/blog/leak– test– using– pressure– transducers/
- https://www.atoptics.co.uk/atoptics/blsky.htm –
- https://www.metoffice.gov.uk/weather/learn– about/weather/optical– effects

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	3	3	2	3
CO2	3	1	1	1	3	3
CO3	3	1	2	1	3	2
CO4	2	3	1	3	3	2
CO5	3	1	1	1	1	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'A' grade by NAAC)

B.Sc. PHYSICS – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025-2026 onwards)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSAP2	ALLIED PRACTICAL – II	ELECTIVE/ ALLIED	–	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	40	60	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course helps to understand the various concepts of physics. This course covers experiments related to light, electricity and magnetism, electronics and sound.

COURSE OBJECTIVES:

Apply various Physics concepts to understand concepts of light, electricity and magnetism, electronics and sound and set up experiment to verify theories and analyze the results.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO	gain the knowledge of experiments related to light, electricity and magnetism, electronics and sound.	Up to K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

LIST OF EXPERIMENTS

Any SEVEN experiments:

1. Thickness of a wire using air wedge
2. Wavelength of mercury lines using spectrometer and grating
3. Refractive index of material of the lens by minimum deviation
4. Determination of AC frequency using Sonometer
5. Determination of figure of merit table galvanometer
6. Characteristics of Zener diode
7. Construction of AND, OR, NOT gates using diodes and transistor
8. NOR gate as a universal building block

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSN21	SPACE PHYSICS	SEC – 2 NME	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course intends to introduce principles of astrophysics describing the science of formation and evolution of stars and interpretation of various heavenly phenomena and provide an understanding of the physical nature of celestial bodies along with the instrumentation and techniques used in astronomical research.

COURSE OBJECTIVES:

The purpose of this course is to develop a basic knowledge about the solar system, stars, galaxies, the universe and understanding of relevant of physical processes.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the physical nature of celestial bodies using astronomical telescopes	Upto K3
CO 2	explain the basic knowledge of solar system	Upto K3
CO 3	classify the types of eclipses and describe the solar atmosphere	Upto K3
CO 4	explain the birth and death of stars	Upto K3
CO 5	classify the different types of galaxies and explain the dark matter	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

SPACE PHYSICS

UNIT – I: TELESCOPES

Optical telescopes – magnifying power, brightness, resolving power and f/a ratio – types of reflecting and refracting telescopes – detectors and image processing – radio telescopes – Hubble space telescope.

UNIT – II: SOLAR SYSTEM

Bode's law of planetary distances – meteors, meteorites, comets, asteroids – Kuiper belt – Oort cloud – detection of gravitational waves – recent advances in astrophysics.

UNIT – III: ECLIPSES

Types of eclipses – solar eclipse – total and partial solar eclipse – lunar eclipse – total and partial lunar eclipse – transits.

THE SUN: physical and orbital data – solar atmosphere – photosphere – chromosphere – solar corona – prominences – sunspots – 11year solar cycle – solar flares.

UNIT – IV: STELLAR EVOLUTION

H– R diagram – birth and death of low mass, intermediate mass and massive stars – Chandrasekar limit – white dwarfs – neutron stars – pulsars – black holes – supernovae.

UNIT – V: GALAXIES

Classification of galaxies – galaxy clusters –interactions of galaxies, dark matter and super clusters – evolving universe.

TEXT BOOKS:

1. R. Murugesan and Kirithiga Sivaprasath, ***Modern Physics***, eleventh edition, S Chand And Company Limited 1984
2. A. Mujiber Rahma***, Concepts of Astrophysics*** Scitech Publication (India) Private Ltd.

REFERENCE BOOKS:

1. Baidyanath Basu, (2001). ***An Introduction to Astrophysics***, Second printing, Prentice – Hall of India (P) Ltd, New Delhi.
2. K.S. Krishnaswamy, (2002), ***Astrophysics – A Modern Perspective***,
3. New Age International (P) Ltd, New Delhi.
4. Shylaja, B.S. and Madhusudan, ***H.R.***,(1999), ***Eclipse: A Celestial Shadow Play***, Orient Black Swan.

DIGITAL TOOLS:

https://www.vedantu.com/physics/eclipse

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	2	2	1	1
CO2	2	1	1	1	3	1
CO3	1	2	1	1	1	1
CO4	2	2	1	2	1	1
CO5	1	1	1	2	1	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

SOURASHTRA COLLEGE, MADURAI – 625004

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B.Sc. PHYSICS – SYLLABUS

(Under CBCS based on OBE)

(For the students admitted from the academic year 2025-2026 onwards)

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
25UPSS21	PROGRAMMING IN C	SEC– 3 DS	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
I	II	25	75	100

Curriculum Design and Development	Employability			Skill Oriented	✓		Entrepreneurship				
	National		Local	✓	Regional	✓	Global				
Curriculum Enrichment	Professional Ethics		Gender		Environment and Sustainability		Human Values		Other Values	✓	

COURSE DESCRIPTION:

This course provides detail concept of Programming in C. This Course covers the basic concepts C– Tokens, C– Expressions and Operators, fundaments of Control Statements, Decision Making Instruction and concepts of Array

COURSE OBJECTIVES:

The purpose of this course is to introduce students about the key features and implementation of C, which is a powerful general purpose programming language available in all platforms and provide an in depth knowledge and skill in it.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the basic concepts of C– tokens	Upto K3
CO 2	explain the C– expressions and operators	Upto K3
CO 3	understand the fundamentals of control of statements in C – Programming	Upto K3
CO 4	elaborate the decision making instructions using branching and looping and implement simple problems using C language.	Upto K3
CO 5	apply concepts of an array to handle a group of data and implement simple problems using C language	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLYING

PROGRAMMING IN C

UNIT – I: INTRODUCTION TO C

Basic structure of C programs – Character set – C tokens –keyword and identifiers – Constants – Variables – Data types – Declaring variables – Initializing variables – type conversions

UNIT – II: OPERATORS, EXPRESSIONS & I/O FUNCTIONS

Types of operators – Arithmetic operators – Relational, logical, and assignment operators – Increment and decrement operators – Conditional operators – Bit wise and special operators – arithmetic expressions – Mathematical functions–priority of operators– Data input and output– get char (), put char (),gets () ,puts( )– scanf (), printf () –escape sequence

UNIT – III: CONTROL STATEMENTS

Simple IF statement – Simple IF– ELSE statement – Block IF Statement – Block IF–ELSE statement – looping operation using while statement–for statement – Break statement – continue statement – Switch statement – Go to statement – Simple programs. (To find the solution of quadratic equation – Fibonacci series – To find the biggest of three nos, factorial and, odd or even)

UNIT – IV: FUNCTIONS

Definingafunction–Accessingafunction–Categoryoffunction–Passingarguments to function –Recursion– Library function. Programs using functions – Binomial coefficient, Sin series, summing the numbers 1 to n using recursion

UNIT – V: ARRAYS

Defining an Array – Processing an array – one, two dimensional arrays – Simple programs using arrays:– (addition of two matrices– subtraction of two matrices–Multiplication of two matrices– ascending and descending order)

TEXT BOOKS:

Programming in C – By E. Balagurusamy – Third Edition – Tata Mcgraw Hill, 2004.

REFERENCE BOOKS

1. ***Theory and Problems of Programming with C*** – By Byron Gottfried Second edition –Tata Megraw Hill, 2004.
2. ***Programming in C*** – Pradip Dey and Manas Ghosh, Oxford University Press, Second Edition.

DIGITAL TOOLS:

- https://www.vssut.ac.in/lecture_notes/lecture1424354156.pdf
- https://www.lpude.in/SLMs/Master%20of%20Computer%20Applications/Sem_1/DECAP010_PROGRAMMING_IN_C.pdf

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	2	2	1	1
CO2	2	1	1	1	3	1
CO3	1	2	1	1	1	1
CO4	2	2	1	2	1	1
CO5	1	1	1	2	1	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level