B.SC.,
PHYSICS

SYLLABUS

FROM THE ACADEMIC YEAR
2023-2024

TAMILNADU STATE COUNCIL FOR HIGHER EDUCATION, CHENNAI – 600 005

B.Sc., PHYSICS SYLLABUS

Preamble

Physics is one of the basic and fundamental sciences. The curriculum for the undergraduate programme in Physics is revised as per the UGC guidelines on Learning Outcome based Course Framework. The learner-centric courses let the student progressively develop a deeper understanding of various aspects of physics.

The new curriculum offer courses in the core areas of mechanics, acoustics, optics and spectroscopy, electricity and magnetism, atomic and nuclear physics, solid state, electronics and other fields. The courses will train students with sound theoretical and experimental knowledge that suits the need of academics and industry. In addition to the theoretical course work, the students also learn physics laboratory methods for different branches of physics, specialized measurement techniques, analysis of observational data, including error estimation and etc. The students will have deeper understanding of laws of nature through the subjects like classical mechanics, quantum mechanics, statistical physics etc. The problem solving ability of students will be enhanced. The students can apply principles in physics to real life problems. The courses like integrated electronics and microprocessors will enhance the logical skills as well as employability skills. The numerical methods and mathematical physics provide analytical thinking and provides a better platform for higher level physics for research.

The restructured courses with well-defined objectives and learning outcomes, provide guidance to prospective students in choosing the elective courses to broaden their skills not only in the field of physics but also in interdisciplinary areas. The elective modules of the framework offer students choice to gain knowledge and expertise in specialized domains of physics like astrophysics, medical physics, etc.

TANSCHE REGULATIONS ON LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK FOR UNDERGRADUATE EDUCATION	
Programme	**B.Sc., Physics**
Programme Code	
Duration	**3 years [UG]**
Programme Outcomes: (These are mereguidelines. Faculty can	**PO1: Disciplinary knowledge:** Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study

create POs based on their curriculum or adopt from UGC or the University for their Programme)	**PO2: Communication Skills:** Ability to express thoughts and ideas effectively in writing and orally communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully; read and write analytically and present complex information in a clear and concise manner to different groups. **PO3: Critical thinking:** Capability to apply the analytic thought to a body of knowledge; analyse and evaluate the proofs, arguments, claims, beliefs on the basis of empirical evidences; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach. **PO4: Problem solving:** Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations. **PO5: Analytical reasoning**: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints. **PO6: Research-related skills**: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation. **PO7: Cooperation/Team work:** Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team. **PO8: Scientific reasoning**: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective. **PO9: Reflective thinking**: Critical sensibility to lived experiences, with self-awareness and reflexivity of both self and society.

	PO10 Information/digital literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data. **PO 11 Self-directed learning**: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion. **PO 12 Multicultural competence:** Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups. **PO 13: Moral and ethical awareness/reasoning**: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to one's work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work. **PO 14: Leadership readiness/qualities:** Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way. **PO 15: Lifelong learning:** Ability to acquire knowledge and skills, including „learning how to learn", that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.
Programme Specific Outcomes: **(These are mere guidelines. Faculty can create POs**	**PSO1: Placement:** To prepare the students who will demonstrate respectful engagement with others' ideas, behaviors, and beliefs and apply diverse frames of reference to decisions and actions. **PSO 2**: **Entrepreneur:** To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate start-ups and high potential organizations

based on their curriculum or adopt from UGC or University for their Programme)	**PSO3**: **Research and Development:** Design and implement HR systems and practices grounded in research that comply with employment laws, leading the organization towards growth and development. **PSO4**: **Contribution to Business World:** To produce employable, ethical and innovative professionals to sustain in the dynamic business world **PSO 5**: **Contribution to the Society:** To contribute to the development of the society by collaborating with stakeholders for mutual benefit

Credit Distribution for B.Sc., Physics Programme, Courses with Laboratory Hours

First Year

Semester-I

Part	List of Courses	Credit	No. of Hours
Part-I	Language - Tamil	3	6
Part-II	English	3	6
Part-III	Core Theory 1 – Properties of Matter and Acoustics	5	5
	Core Practical 1 – Physics Practical 1	3	3
	Allied Theory 1 - Allied Mathematics 1	5	6
Part-IV	Skill Enhancement Course SEC-1 *	2	2
	Foundation Course	2	2
		23	**30**

Semester-II

Part	List of Courses	Credit	No. of Hours
Part-I	Language– Tamil	3	6
Part-II	English	3	6
Part-III	Core Theory 2 – Heat, Thermodynamics and Statistical Physics	5	5
	Core Practical 2 – Physics Practical 2	3	3
	Allied Theory 2 – Allied Mathematics 2	5	6
Part-IV	Skill Enhancement Course -SEC-2 *	2	2
	Skill Enhancement Course -SEC-3 (Discipline/Subject Specific) *	2	2
		23	**30**

*** Select SEC-1 for First Semester, SEC-2 and SEC-3 for Second Semester from the list of Skill Enhancement Courses (SEC)**

SKILL ENHANCEMENT COURSES (SEC)

1. PHYSICS FOR EVERYDAY LIFE
2. ASTROPHYSICS
3. MEDICAL PHYSICS
4. HOME ELECTRICAL INSTALLATION
5. PHYSICS OF MUSIC

COURSE	**FIRST SEMESTER – FOUNDATION COURSE**
COURSE TITLE	**INTRODUCTORY PHYSICS**
CREDITS	2
COURSE OBJECTIVES	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.

UNITS	**COURSE DETAILS**
UNIT-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
UNIT-II	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 lawsof momentum, energy – typesof 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 – stream line 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
UNIT-VI	**PROFESSIONAL COMPONENTS: E**xpert lectures –seminars — webinars – industry inputs – social accountability – patriotism
TEXT BOOKS	1. D.S. Mathur, 2010, Elements of Properties of Matter, S.Chand and Co 2. BrijLaland N. Subrahmanyam, 2003, Properties of Matter, S.Chand and Co.
REFERENCE BOOKS	1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S.Chand and Co. 2.
WEB RESOURCES	1. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.htmlhttps://science.nasa.gov/ems/ 2. https://eesc.columbia.edu/courses/ees/climate/lectures/radiation_hays/

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

COURSEOUTCOMES:

At the end of the course, the student will be able to:

COURSEOUTCOMES	**CO1**	Apply concept of vectors to understand concepts of Physics and solve problems
	CO2	Appreciate different forces present in Nature while learning about phenomena related to these different forces.
	CO3	Quantify energy in different process and relate momentum, velocity and energy
	CO4	Differentiate different types of motions they would encounter in various courses and understand their basis
	CO5	Relate various properties of matter with their behaviour and connect them with different physical parameters involved.

MAPPINGWITHPROGRAMOUTCOMES:

Map course outcomes **(CO)** for each course with program outcomes **(PO)** in the3-point scale of STRONG (**3**), MEDIUM (**2**) and LOW (**1**).

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

COURSE	**FIRST SEMESTER –CORE THEORY 1**
COURSETITLE	**PROPERTIES OF MATTER AND ACOUSTICS**
CREDITS	4
COURSE OBJECTIVES	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.

UNITS	COURSEDETAILS
UNIT-I	**ELASTICITY:** Hooke's law – 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)
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 – experiment to find Young's modulus – non-uniform bending– experiment to determine Young's modulus by Koenig's method – uniform bending – expression for elevation – experiment to determine Young's modulus using microscope
UNIT-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
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- free, damped, forced vibrations –resonance and Sharpness of resonance. 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.

	Ultrasonic waves: production of ultrasonic waves – Piezoelectric crystal method –magnetostriction effect – application of ultrasonic waves
UNIT-VI	**PROFESSIONAL COMPONENTS:** expert lectures –seminars — webinars – industry inputs – social accountability – patriotism
TEXT BOOKS	1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand and Co. 2. BrijLaland N. Subrahmanyam, 2003, Properties of Matter, S.Chand and Co 3. D.R.Khanna and R.S.Bedi, 1969, Textbook of Sound, AtmaRamand sons 4. BrijLal and N.Subrahmanyam, 1995, A Text Book of Sound, Second revised edition,Vikas Publishing House. 5. R.Murugesan,2012, Properties of Matter, S.Chand and 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 and Co. 3. A.P French, 1973, Vibration and Waves, MIT Introductory Physics, Arnold-Heinmann India.
WEB RESOURCES	1. https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work 2. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html 3. https://www.youtube.com/watch?v=gT8Nth9NWPM 4. https://www.youtube.com/watch?v=m4u-SuaSu1sandt=3s 5. https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work 6. https://learningtechnologyofficial.com/category/fluid-mechanics-lab/ 7. http://www.sound-physics.com/ 8. http://nptel.ac.in/courses/112104026/

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

COURSE OUTCOMES:

At the end of the course, the student will be able to:

COURSEOUTCOMES	**CO1**	Relate elastic behavior in terms of three modulii of elasticity and working of torsion pendulum.
	CO2	Able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials.
	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.
	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
	CO5	Understand the concept of acoustics, importance of constructing buildings with good acoustics. Able to apply their knowledge of ultrasonics in real life, especially in medical field and assimilate different methods of production of ultrasonic waves

MAPPING WITH PROGRAM OUT COMES:

Map course outcomes **(CO)** for each course with program outcomes **(PO)** in the3-point scale of STRONG (**3**), MEDIUM (**2**) and LOW (**1**).

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	M	M	S	M	M	S	M	S
CO2	M	S	S	S	M	M	S	M	S	S
CO3	S	M	S	M	S	S	M	S	S	S
CO4	S	S	S	S	S	M	S	M	M	M
CO5	M	M	S	S	M	S	S	S	S	M

COURSE	**FIRST SEMESTER –CORE PRACTICAL 1**
COURSETITLE	**PRACTICAL 1**
CREDITS	3
COURSE OBJECTIVES	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

Properties of Matter

Minimum of Eight Experiments from the list:

1. Determination of rigidity modulus without mass using Torsional pendulum.
2. Determination of rigidity modulus with masses using Torsional pendulum.
3. Determination of moment of inertia of an irregular body.
4. Verification of parallel axes theorem on moment of inertia.
5. Verification of perpendicular axes theorem on moment of inertia.
6. Determination of moment of inertia and g using Bifilar pendulum.
7. Determination of Young's modulus by stretching of wire with known masses.
8. Verification of Hook's law by stretching of wire method.
9. Determination of Young's modulus by uniform bending – load depression graph.
10. Determination of Young's modulus by non-uniform bending – scale and telescope.
11. Determination of Young's modulus by cantilever – load depression graph.
12. Determination of Young's modulus by cantilever – oscillation method
13. Determination of Young's modulus by Koenig's method – (or unknown load)
14. Determination of rigidity modulus by static torsion.
15. Determination of Y, n and K by Searle's double bar method.
16. Determination of surface tension and interfacial surface tension by drop weight method.
17. Determination of co-efficient of viscosity by Stokes' method – terminal velocity.
18. Determination of critical pressure for streamline flow.
19. Determination of Poisson's ratio of rubber tube.
20. Determination of viscosity by Poiseullie's flow method.
21. Determination of radius of capillary tube by mercury pellet method.
22. Determination of g using compound pendulum.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

COURSE	**SECOND SEMESTER – CORE THEORY 2**
COURSETITLE	**HEAT, THERMODYNAMICS and STATISTICAL PHYSICS**
CREDITS	4
COURSE 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

UNITS	**COURSEDETAILS**
UNIT-I	**CALORIMETRY:** specific heat capacity – specific heat capacity of gases C_P and C_V– Meyer's relation – Joly's method for determination of C_V – Regnault's method for determination of C_P **LOWTEMPERATUREPHYSICS:** Joule-Kelvin effect – porous plug experiment – Joule-Thomson effect –Boyle temperature – temperature of inversion – liquefaction of gas by Linde's Process – adiabatic demagnetisation.
UNIT-II	**THERMODYNAMICS-I:** zeroth law and first law of thermodynamics – P-V diagram – heat engine –efficiency of heat engine – Carnot's engine, construction, working and efficiency of petrol engine and diesel engines – comparison of engines.
UNIT-III	**THERMODYNAMICS-II:** second law of thermodynamics – entropy of an ideal gas – entropy change in reversible and irreversible processes – T-S diagram –thermodynamical scale of temperature – Maxwell's thermodynamical relations –Clasius-Clapeyron's equation (first latent heat equation) – third law of thermodynamics – unattainability of absolute zero – heat death.
UNIT-IV	**HEATTRANSFER:** 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	**STATISTICALMECHANICS:** definition of phase-space – micro and macro states – ensembles –different types of ensembles – 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.

UNIT-VI	**PROFESSIONAL COMPONENTS :** expert lectures –seminars — webinars – industry inputs – social accountability – patriotism
TEXT BOOKS	1. BrijlalandN. Subramaniam, 2000, Heat and Thermodynamics, S.Chandand Co. 2. Narayanamoorthy and Krishna Rao, 1969,Heat,Triveni Publishers, Chennai. 3. V.R.Khanna and R.S.Bedi, 1998 1st Edition, Text book of Sound, Kedharnaath Publish and Co, Meerut 4. Brijlal and N. Subramanyam, 2001, Waves and Oscillations,Vikas Publishing House, New Delhi. 5. Ghosh, 1996, Text Book of Sound, S.Chand and Co. 6. R.Murugeshan and Kiruthiga Sivaprasath, Thermal Physics, S.Chandand Co.
REFERENCE BOOKS	1. J.B.Rajam and C.L.Arora, 1976, Heat and Thermodynamics, 8th edition, S.Chand and Co. Ltd. 2. D.S.Mathur, Heat and Thermodynamics, Sultan Chand and Sons. 3. Gupta, Kumar, Sharma, 2013, Statistical Mechanics, 26th Edition, S. Chand and Co. 4. Resnick, HallidayandWalker,2010, Fundamentals of Physics, 6th Edition. 5. Sears, Zemansky, Hugh D. Young ,Roger A. Freedman, 2021 University Physics with Modern Physics 15th Edition, Pearson. 6.
WEB RESOURCES	1. https://youtu.be/M_5KYncYNyc 2. https://www.youtube.com/watch?v=4M72kQulGKkandvl=en 3. Lecture 1: Thermodynamics Part 1 | Video Lectures | Statistical Mechanics I: Statistical Mechanics of Particles | Physics | MIT Open Course Ware 4. http://www.freebookcentre.net/Physics/Physics-Books-Online.html

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

COURSE OUTCOMES:

At the end of the course, the student will be able to:

COURSEOUTCOMES	**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. The study of Low temperature Physics sets the basis for the students to understand cryogenics, superconductivity, superfluidity and Condensed Matter Physics
	CO2	Derive the efficiency of Carnot's engine. Discuss the implications of the laws of Thermodynamics in diesel and petrol engines
	CO3	Able to analyze performance of thermodynamic systems viz efficiency by problems. Gets an insight into thermodynamic properties like enthalpy, entropy
	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
	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

MAPPING WITH PROGRAM OUT COMES:

Map course outcomes **(CO)** for each course with program outcomes **(PO)** in the3-point scale of STRONG (**S**), MEDIUM (**M**) and LOW (**L**).

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	M	S	M
CO2	M	S	S	S	M	S	S	M	M	M
CO3	S	S	S	M	S	S	S	M	S	M
CO4	S	S	S	S	S	S	S	M	M	M
CO5	S	S	M	S	S	S	M	M	S	M

COURSE	**SECOND SEMESTER – COREPRACTICAL 2**
COURSETITLE	**PRACTICAL 2**
CREDITS	3
COURSE OBJECTIVES	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

HEAT, OSCILLATIONS, WAVES and SOUND

Minimum of Eight Experiments from the list:

1. Determination of specific heat by cooling – graphical method.
2. Determination of thermal conductivity of good conductor by Searle's method.
3. Determination of thermal conductivity of bad conductor by Lee's disc method.
4. Determination of thermal conductivity of bad conductor by Charlaton's method.
5. Determination of specific heat capacity of solid.
6. Determination of specific heat of liquid by Joule's electrical heating method (applying radiation correction by Barton's correction/graphical method),
7. Determination of Latent heat of a vaporization of a liquid.
8. Determination of Stefan's constant for Black body radiation.
9. Verification of Stefan's-Boltzmans law.
10. Determination of thermal conductivity of rubber tube.
11. Helmholtz resonator.
12. Velocity of sound through a wire using Sonometer.
13. Determination of velocity of sound using Kunds tube.
14. Determination of frequency of an electrically maintained tuning fork
15. To verify the laws of transverse vibration using sonometer.
16. To verify the laws of transverse vibration using Melde's apparatus.
17. To compare the mass per unit length of two strings using Melde's apparatus.
18. Frequency of AC by using sonometer.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

SKILL ENHANCEMENT COURSES (SEC)

PHYSICS FOR EVERYDAY LIFE	
Learning 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	
UNITS	**COURSE DETAILS**
UNIT-I	**MECHANICAL OBJECTS: s**pring scales – bouncing balls –roller coasters – bicycles –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 – Solar Photo – voltaic cells – General applications of solar cells.
UNIT-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.
TEXT BOOKS	1. The Physics in our Daily Lives, Umme Ammara, Gugu cool Publishing, Hyderabad, 2019. 2. For the love of physics, Walter Lawin, Free Press, New York, 2011. 3.

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ASTROPHYSICS	
Learning Objective: 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	
UNITS	**COURSE DETAILS**
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. **GALAXIES:** classification of galaxies – galaxy clusters –interactions of galaxies, dark matter and super clusters – evolving universe.
UNIT-V	**ACTIVITIES IN ASTROPHYSICS:** (i) Basic construction of telescope (ii) Develop models to demonstrate eclipses/planetary motion (iii) Night sky observation (iv) Conduct case study pertaining to any topic in this paper (v) Visit to any one of the National Observatories Any three activities to be done compulsorily.
TEXT 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, New Age International (P) Ltd, New Delhi. 3. Shylaja, B.S. and Madhusudan, H.R.,(1999), Eclipse: A Celestial Shadow Play, Orient Black Swan, 4.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

PHYSICS OF MEDICAL INSTRUMENTS	
Learning Objective: The students will be exposed to instruments like ECG, EEG, EMG, medical imaging, diagnostic specialties, operation theater and its safety which will kindle interest to specialize in instrument servicing.	
UNITS	**COURSE DETAILS**
UNIT-I	**BIO-POTENTIALS AND ELECTRODES:** transport of ions through cell membrane- resting and action potential - Characteristics of resting potential – bio-electric potential – design of medical instruments – components of bio-medical instrumentation – electrodes – electrode potential – metal microelectrode – depth and needle electrodes – types of surface electrode – the pH electrode.
UNIT-II	**Bio-potential based Instrumentation:** Electrocardiography (ECG) – origin of cardiac action potential - ECG lead configuration –block diagram of ECG recording set up (qualitative) – Electroencephalography (EEG) – origin of EEG – action and evoked potentials - brain waves – block diagram of modern EEG set up – electromyography (EMG) – block diagram of EMG recording setup.
UNIT-III	**OPERATION THEATRE AND SAFETY:** diathermy – block diagram of the electrosurgical diathermy– shortwave, microwave, ultrasonic diathermy – ventilators – servo controlled systems – **RADIATION SAFETY:** units of radiation - pocket dosimeter – pocket type radiation alarm – thermo-luminescence dosimeter.
UNIT-IV	**MEDICAL IMAGING:** nuclear imaging technique –computer tomography (CT) – principle – mathematical basis of image construction –block diagram of CT scanner – ultrasonic imaging systems – construction of transducer – display modes – MRI principle and instrumentation.
UNIT-V	**DIAGNOSTICS AND SPECIALITIES:**X-rays in radiography – fluoroscopy – comparison– image intensifiers – angiography – applications of X-ray examination (*problems*). **LASER IN MEDICINE:** laser interactions with biomolecules – advantages of laser surgery – endoscopy – types of endoscopes with their operation (qualitative).
TEXT BOOKS	1. Biomedical Instrumentation and measurement, Leslie Cromwell, PHI, 2015 2. Medical Instrumentation, M. Arumugam, Anuradha agencies, 1992 3. Medical Electronics, M.J.Kumar Doss, Prathibha Publishers, 1987 4. Medical Physics, John R. Cameron and James G. Skofronick, Thrift books, Atlanta, 1985 5. Electronic Instruments and Instrumentation Technology, M. M.M.Anand, PHI, 2015

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

HOME ELECTRICAL INSTALLATION	
Learning Objective: The students will get knowledge on electrical instruments, installations and domestic wiring techniques with safety precautions and servicing.	
UNITS	**COURSE DETAILS**
UNIT-I	**SIMPLE ELECTRICAL CIRCUITS: c**harge, current, potential difference, resistance – simple electrical circuits – DC ammeter, voltmeter, ohmmeter – Ohm's law – difference between DC and AC – advantages of AC over DC – electromagnetic induction - transformers – inductors/chokes – capacitors/condensers – impedance – AC ammeter, voltmeter –symbols and nomenclature
UNIT-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 – quality of connecting wires – characteristics of single and multicore wires
UNIT-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 – heavy equipment like AC, fridge, washing machine, oven, geyser, jet pumps – provisions for inverter – gauge specifications of wires for various needs
UNIT-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 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
UNIT-V	**SAFETY MEASURES:** insulation for wires – colour specification for mains, return and earth – Understanding of fuse and circuit breakers – types of fuse: 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
TEXT BOOKS	1. Wiring a House: 5th Edition by Rex Cauldwell, (2014). 2. Black and Decker Advanced Home Wiring, 5th Edition: Backup Power - Panel Upgrades - AFCI Protection - "Smart" Thermostats, by Editors of Cool Springs Press, (2018). 3. Complete Beginners Guide to Rough in Electrical Wiring: by Kevin Ryan (2022).

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

PHYSICS OF MUSIC	
Learning Objective: To apprise and train students on the role of Physics in music and get the knowledge on the musical notes and instruments.	
UNITS	**COURSE DETAILS**
UNIT-I	**SCIENTIFIC STUDY OF MUSIC:** vibrations of atoms of matter– vibrations coupling to air – propagation of sound waves in air, other media, fluids and solids – velocity, frequency, wavelength, time period, intensity: definition and unit fs – classification of sound on frequency and velocity– human and animal sound perception– mechanism of ear and hearing – psychoacoustics
UNIT-II	**SIMPLE VIBRATING SYSTEMS:** simple harmonic motion – tuning fork– amplitude, phase, energy, energy loss/damping/ dissipation – power – travelling waves and standing waves– laws of vibration in stretched strings– one-dimensional medium – open and closed organ pipes – over tones, harmonics – quality of sound: pitch, timber, loudness – octaves, musical notes
UNIT-III	**MUSICAL TONE:** pure/simple tones – sine/cosine waves– well-defined frequencies, wavelengths, amplitudes and phases– partial tones – assembly of pure tones– mix of different frequencies and amplitudes– complex tone – superposition of simple tones – complex waveform– periodic complex waveform – formants – resonances– sound envelope
UNIT-IV	**PRODUCTION OF MUSICAL SOUNDS:** human voice, mechanism of vocal sound production – larynx (sound box) – *stringed Instruments*: plucked and bowed, guitar, mandolin, violin, piano, etc. – *wind instruments*: whistles, flute, saxophone, pipe organ, bagpipes, etc.– *percussion instruments*: plates, membranes, drums, cymbals, xylophone etc. – *electronic instruments*: keyboards, electric guitars, rhythm pads, etc. – analog and digital sound synthesizers,–MIDI instrument– computer generated music
UNIT-V	**RECORDING OF MUSIC and SOUND:** Edison phonograph – cylinder and disk records – magnetic wire and tape recorders – digital recording (e.g. to CD, DVD, etc.)– analog transducers, condenser, dynamic microphones, loudspeaker – complex sound fields – near and far fields of acoustic– spectral analysis techniques – continuous and discrete Fourier transforms, digital signal processing – digital filtering – specifications of recording studios
TEXT BOOKS	1. Physics and Music: The Science of Musical Sound by Harvey White (2014) 2. Good Vibrations – The Physics of Music by Barry Parker, (2009) 3. The History of Musical Instruments by Curt Sachs, (2006) 4. Physics and Music: Essential Connections and Illuminating Excursions by Kinko Tsuji and Stefan C. Müller(2021)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

COURSE	**ALLIED PAPER**
COURSETITLE	**ALLIED PHYSICS – I**
CREDITS	3
COURSE OBJECTIVES	To impart basic principles of Physics that which would be helpful for students who have taken programmes other than Physics.

UNITS	COURSE DETAILS
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. Viscosity: Streamline and turbulent motion – Critical velocity – Coefficient of viscosity – Poiseuille's formula. Surface tension: definition – Molecular theory –Droplets formation–shape, size and lifetime – COVID transmission through droplets.
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.
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 – Overview of Government initiatives: Software technological parks under MeitY.
UNIT-VI	**PROFESSIONAL COMPONENTS: E**xpert lectures –Seminars — Webinars – Industry inputs – Social accountability – Patriotism
TEXT BOOKS	1. R.Murugesan (2001), Allied Physics, S. Chand and 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 and Co., NewDelhi. 4. J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics (8^{th} edition), S.Chand and Co.,New Delhi. 5. R.Murugesan(2005), Optics and Spectroscopy, S.Chand and Co, New Delhi. 6. A.Subramaniyam, Applied Electronics 2^{nd} Edn., National Publishing Co., Chennai.

REFERENCEBOOKS	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), Text book of Sound 1st Edn. Kedharnaath Publish and Co, Meerut. 3. N.S.Khare and S.S.Srivastava (1983), Electricity and Magnetism 10th Edn., Atma Ram and Sons, New Delhi. 4. D.R.Khanna and H.R. Gulati(1979). Optics, S. Chand and Co. Ltd., New Delhi. **5.** V.K.Metha (2004). Principles of electronics 6th Edn. S.Chand and company.
WEB RESOURCES	1. https://youtu.be/M_5KYncYNyc 2. https://youtu.be/ljJLJgIvaHY 3. https://youtu.be/7mGqd9HQ_AU 4. https://youtu.be/h5jOAw57OXM 5. https://learningtechnologyofficial.com/category/fluid-mechanics-lab/ 6. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.htmlhttps://www.youtube.com/watch?v=gT8Nth9NWPMhttps://www.youtube.com/watch?v=9mXOMzUruMQandt=1shttps://www.youtube.com/watch?v=m4u-SuaSu1sandt=3shttps://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

COURSE OUTCOMES:

At the end of the course, the student will be able to:

COURSE OUTCOMES	**CO1**	Explain types of motion and extend their knowledge in the study of various dynamic motions analyze and demonstrate mathematically. Relate theory with practical applications in medical field.
	CO2	Explain their knowledge of understanding about materials and their behaviors and apply it to various situations in laboratory and real life. Connect droplet theory with Corona transmission.
	CO3	Comprehend basic concept of thermodynamics concept of entropy and associated theorems able to interpret the process of flow temperature physics in the background of growth of this technology.
	CO4	Articulate the knowledge about electric current resistance, capacitance in terms of potential electric field and electric correlate the connection between electric field and magnetic field and analyze them mathematically verify circuits and apply the concepts to construct circuits and study them.
	CO5	Interpret the real life solutions using AND, OR, NOT basic logic gates and intend their ideas to universal building blocks. Infer operations using Boolean algebra and acquire elementary ideas of IC circuits. Acquire information about various Govt. programs/ institutions in this field.

MAPPING WITH PROGRAM OUT COMES:

Map course outcomes **(CO)** for each course with program outcomes **(PO)** in the3-point scale of STRONG (**3**), MEDIUM (**2**) and LOW (**1**).

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	M	S	S	S	M	S	S	S	S	M
CO3	M	S	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	M	S	S	S	S	S	S	S	S	S

COURSE	**ODD SEMESTER – CORE**
COURSETITLE	**ALLIED PRACTICAL– I**
CREDITS	3
COURSE OBJECTIVES	Apply various physics concepts to understand Properties of Matter and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results

Minimum of Eight Experiments from the list:

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. Determination of g by Compound Pendulum
4. Rigidity modulus by static torsion method.
5. Rigidity modulus by torsional oscillations without mass
6. Surface tension and interfacial Surface tension – drop weight method
7. Comparison of viscosities of two liquids – burette method
8. Specific heat capacity of a liquid – half time correction
9. Verification of laws of transverse vibrations using sonometer
10. Calibration of low range voltmeter using potentiometer
11. Determination of thermo emf using potentiometer
12. Verification of truth tables of basic logic gates using ICs
13. Verification of De Morgan's theorems using logic gate ICs.
14. Use of NAND as universal building block.

Note : Use of digital balance permitted

METHOD OF EVALUATION:

Continuous Internal Assessment	**End Semester Examination**	**Total**	**Grade**
25	**75**	**100**	

COURSE	**ALLIED PAPER**
COURSETITLE	**ALLIED PHYSICS –II**
CREDITS	3
COURSE OBJECTIVES	To understand the basic concepts of optics, modern Physics, concepts of relativity and quantum physics, semiconductor physics, and electronics.

UNITS	**COURSE DETAILS**
UNIT-I	**OPTICS: i**nterference – 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 – Optical activity – Application in sugar industries
UNIT-II	**ATOMIC PHYSICS:** Atom models – Bohr atom model – Mass number – Atomic number – Nucleons –Pauli's exclusion principle – electronic configuration – Periodic classification of elements –Zeeman effect (elementary ideas only) – Photo electric effect – Einstein's photoelectric equation – Applications of photoelectric effect:
UNIT-III	**NUCLEAR PHYSICS: N**uclear models – Liquid drop model – Magic numbers –Nuclear energy – Mass defect – Binding energy – Radioactivity – Uses – Chain reaction - Controlled and uncontrolled chain reaction – Nuclear fission – Energy released in fission —Nuclear fusion – Differences between fission and fusion.
UNIT-IV	**INTRODUCTION TO RELATIVITY AND GRAVITATIONAL WAVES**: Frame of reference – Postulates of special theory of relativity - Lorentz transformation equations – Derivation – Length contraction – Time dilation – 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 construction and working – Advantages (no mathematical treatment) – USB cell phone charger –Introduction to e-vehicles and EV charging stations
UNIT-VI	**PROFESSIONAL COMPONENTS:** Expert lectures –Seminars – – Webinars – Industry inputs – Social accountability –Patriotism
TEXT BOOKS	1. R.Murugesan (2005), Allied Physics, S.Chand and Co, NewDelhi. 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, NewDelhi. 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 McGrawHill Publication, New Delhi. 4. Thomas L. Floyd (2017), Digital Fundamentals, 11th Edn., Universal Book Stall, NewDelhi. 5. V.K.Metha (2004), Principles of electronics, 6th Edn. ,S.Chandand Company, New Delhi.
WEB RESOURCES	1. https://www.berkshire.com/learning-center/delta-p-facemask/https://www.youtube.com/watch?v=QrhxU47gtj4https://www.youtube.com/watch?time_continue=318andv=D38BjgUdL5Uandfeature=emb_logo 2. https://www.youtube.com/watch?v=JrRrp5F-Qu4 3. https://www.validyne.com/blog/leak-test-using-pressure-transducers/ 4. https://www.atoptics.co.uk/atoptics/blsky.htm - 5. https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	**75**	**100**	

COURSE OUTCOMES:
At the end of the course, the student will be able to:

COURSE OUTCOMES	**CO1**	Explain the concepts of interference diffraction using principles of superposition of waves and rephrase the concept of polarization based on wave patterns
	CO2	Outline the basic foundation of different atom models and various experiments establishing quantum concepts. Relate the importance of interpreting improving theoretical models based on observation. Appreciate interdisciplinary nature of science and in solar energy related applications.
	CO3	Summarize the properties of nuclei, nuclear forces structure of atomic nucleus and nuclear models. Solve problems on delay rate half-life and mean-life. Interpret nuclear processes like fission and fusion. Understand the importance of nuclear energy, safety measures carried and get our Govt. agencies like DAE guiding the country in the nuclear field.
	CO4	To describe the basic concepts of relativity like equivalence principle, inertial frames and Lorentz transformation. Extend their knowledge on concepts of relativity and viceversa. Relate this with current research in this field and get an overview of research projects of National and International importance, like LIGO, ICTS, and opportunities available.
	CO5	Summarize the working of semiconductor devices like junction diode, Zener diode, transistors and practical devices we daily use like USB chargers and EV charging stations.

MAPPING WITH PROGRAM OUT COMES:

Map course outcomes **(CO)** for each course with program outcomes **(PO)** in the3-point scale of STRONG (**3**), MEDIUM (**2**) and LOW (**1**).

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	M	S	S	S	M	S	S	S	S	M
CO3	M	S	S	S	S	M	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	M	S	S	S	S	S	S	S	S	S

COURSE	**EVEN SEMESTER - CORE**
COURSETITLE	**ALLIED PRACTICAL– II**
CREDITS	3
COURSE OBJECTIVES	Apply various Physics concepts to understand concepts of Light, electricity and magnetism and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results

Minimum of Eight Experiments from the list:

1. Radius of curvature of lens by forming Newton's rings
2. Thickness of a wire using air wedge
3. Wavelength of mercury lines using spectrometer and grating
4. Refractive index of material of the lens by minimum deviation
5. Refractive index of liquid using liquid prism
6. Determination of AC frequency using sonometer
7. Specific resistance of a wire using PO box
8. Thermal conductivity of poor conductor using Lee's disc
9. Determination of figure of merit table galvanometer
10. Determination of Earth's magnetic field using field along the axis of a coil
11. Characterisation of Zener diode
12. Construction of Zerner/IC regulated power supply
13. Construction of AND, OR, NOT gates using diodes and transistor
14. NOR gate as a universal building block

METHOD OF EVALUATION:

Continuous Internal Assessment	**End Semester Examination**	**Total**	**Grade**
25	**75**	**100**	