G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI

Programme Structure for Physics

(For those admitted from the academic year 2023-24 and onwards)

Category	Course Type	Course Code	Course Title	Contact Hours	Exam Hours	Marks			Credit
						CIA	ESE	Total Marks	
Semester-1									
PART-I	Language	U23TA1L1	Tamil– I	6	3	25	75	100	3
PART-II	English	U23EN1L1	English – I	6	3	25	75	100	3
PART-III	Core-1	U23PH101	Properties of Matter and Acoustics	5	3	25	75	100	5
	Core Lab 1	U23PH1P1	Core Physics Practicals – I	3	3	40	60	100	3
	Elective Generic -1	U23MA1A1	Theory of Equation and Matrices	6	3	25	75	100	4
PART-IV	Skill Enhancement Courses SEC1(NME – I)	U23PH1S1	Physics for Everyday life	2	-	50	-	50	2
	Foundation Course FC	U23PHFC1	Introductory Physics	2	-	50	-	50	2
TOTAL				**30**				**600**	**22**
Semester-II									
PART-I	Language	U23TA2L2	Tamil– II	6	3	25	75	100	3
PART-II	English	U23EN2L2	English – II	6	3	25	75	100	3
PART-III	Core-2	U23PH202	Heat, Thermodynamics and Statistical Physics	5	3	25	75	100	5
	Core Lab 2	U23PH2P2	Core Physics Practicals – II	3	3	40	60	100	3
	Elective Generic -2	U23MA2A2	Vector Calculus	6	3	25	75	100	4
	Comprehension - 1(Self Study Course- Online Exam)	U23PH2C1	Comprehension in Physics – I	-	1	-	50	50	1
PART-IV	Skill Enhancement Courses SEC2(NME – II)	U23PH2S2	AstroPhysics	2	-	50	-	50	2
	Skill Enhancement Courses (DS) SEC3	U23PH2S3	Home Electrical Installation	2	2	-	50	50	2

Part-III B.Sc. Physics / Semester – I /
Core Lab – 1 : CORE PHYSICS PRACTICALS – I (U23PH1P1)

Lecture Hours : -- **Tutorial Hours : ---**

Practical Hours : 45hrs **No. of Credit 3**

Contact Hours per Semester : 45 hrs

Contact hours per Week : 3 hrs

Internal Marks : 40 Marks

External Marks : 60 Marks

Total Marks : 100 Marks

OBJECTIVES OF THE COURSE

- 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

COURSE LEARNING OUTCOMES

CO1: understand the experimental ideas related with Properties of matter.

CO2: develop the skill of performing experiments accurately and analyze observations.

CO3: by constructing the experimental setup and making meaningful conclusions.

CO-PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COS	Program Outcomes(POs)							Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	3	2	3	2	2	3	2	2
CO2	2	2	2	2	2	3	3	2	2	3
CO3	1	2	2	2	3	2	2	2	2	2
Total contribution of CO to POs & PSOs	6	6	7	6	8	7	7	7	6	7
Weighted Percentage of COs contribution to POs & PSOs	66.67	66.67	77.78	66.67	88.89	77.78	77.78	77.78	66.67	77.78

1 - Low 2 - Medium 3 - High

CORE PHYSICS PRACTICALS - I (U23PH1P1)

Minimum of Eight Experiments from the list:

1. Measurements of length (or diameter) using Vernier callipers, Screw gauge and Travelling microscope.
2. Determination of rigidity modulus without mass using Torsional pendulum.
3. Determination of rigidity modulus with masses using Torsional pendulum.
4. Determination of Young's modulus by uniform bending – load depression graph.
5. Determination of Young's modulus by non-uniform bending – scale and telescope.
6. Determination of Young's modulus by cantilever – load depression graph.
7. Determination of surface tension and interfacial surface tension by drop weight method.
8. Determination of co-efficient of viscosity by Stokes' method.
9. Determination of critical pressure for streamline flow.
10. Determination of viscosity by Poiseullies flow method.
11. Determination of radius of capillary tube by mercury pellet method.
12. Determination of g using compound pendulum.
13. Verification of parallel axes theorem on moment of inertia.
14. Verification of perpendicular axes theorem on moment of inertia.

Part-III B.Sc. Physics / Semester – I / Elective Generic Lab 1: ALLIED PHYSICS PRACTICALS – I (U23PH1AP)

Lecture Hours	**:--**	**Tutorial Hours : --**	**Practical Hours:30 hrs**
Contact Hours per Semester	**:**	**30 hrs**	**No. of Credit : 1**
Contact hours per Week	**:**	**2 hrs**	
Internal Marks	**:**	**40 Marks**	
External Marks	**:**	**60 Marks**	
Total Marks	**:**	**100 Marks**	

OBJECTIVES OF THE COURSE

Apply various physics concepts to understand Properties of Matter, Heat, Waves, Electricity and Digital Electronics, set up experimentation to verify theories, quantify and analyze, able to do error analysis and correlate results.

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

CO1 understand the experimental ideas related with Properties of matter, sound and Electricity and Digital Electronics.

CO2 develop the skill of performing experiments accurately and analyze observations.

CO3 construct the experimental setup and making meaningful conclusions.

CO-PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COs	**Program Outcomes(POs)**							**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	3	2	3	2	2	3	2	3
CO2	2	2	2	2	3	3	3	2	3	1
CO3	1	2	2	2	2	2	2	2	3	2
Total contribution ofCO to POs & PSOs	6	6	7	6	8	7	7	7	8	6
Weighted Percentage of COs contribution to POs& PSOs	66.67	66.67	77.78	66.67	88.88	77.78	77.78	77.78	88.88	66.67

1 - Low 2 - Medium 3 - High

ALLIED PHYSICS PRACTICALS – I (U23PH1AP)

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

Note : Use of digital balance permitted

Part-III B.Sc. Physics / Semester – I / SEC1 (NME – I)
PHYSICS FOR EVERYDAY LIFE (U23PH1S1)

Lecture Hours	**:**	**30 hrs**	**Tutorial Hours**	**: --**
Practical Hours	**:**	**--**	**No. of Credit**	**: 2**

Contact Hours per Semester : 30hrs

Contact hours per Week : 2 hrs

Internal Marks : 50 Marks

Total Marks : 50 marks

OBJECTIVES OF THE COURSE

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.

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

CO1 recall the basic concepts of various branches of physics.
CO2 explain the basics of Mechanics, home appliance, laser, optical concepts
CO3 apply the concepts learned to explain its applications.
CO4 emphasize the discipline of physics to be most important branch of science.
CO5 relate the sub fields and current developments in the field of physics

CO - PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COS	Program Outcomes(POs)							Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	2	3	3	1	2	3	2
CO2	2	2	2	2	2	3	2	3	2	2
CO3	2	2	1	2	2	2	2	3	3	2
CO4	3	3	2	2	3	2	2	2	2	3
CO5	1	2	2	1	3	2	3	2	1	3
Total contributionof CO to POs & PSOs	10	11	9	9	13	12	10	12	11	12
Weighted Percentage of COs contribution to POs & PSOs	66.67	73.33	60	60	86	80	66.67	80	73.33	80

1 - Low 2 - Medium 3 - High

COURSE CONTENT

UNIT – I MECHANICAL OBJECTS (5 L hrs)

Spring scales – Bouncing balls –Roller coasters – Bicycles –Rockets and Space Travel.

UNIT – II OPTICAL INSTRUMENTS AND LASER (7 L hrs)

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

UNIT – III PHYSICS OF HOME APPLIANCES (7 L hrs)

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

UNIT – IV SOLAR ENERGY (6 L hrs)

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

UNIT – V INDIAN PHYSICIST AND THEIR CONTRIBUTIONS (5L hrs)

C.V.Raman, HomiJehangirBhabha, Vikram Sarabhai, Subrahmanyan Chandrasekhar, Venkatraman Ramakrishnan, Dr. APJ Abdul Kalam and their contribution to science and technology.

TEXT BOOKS

1.D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand & Co.

2.BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S.Chand & Co

REFERENCE BOOKS

1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S.Chan &Co.

WEB LINKS

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/

Part-III B.Sc. Physics / Semester – I / FOUNDATION COURSE: INTRODUCTORY PHYSICS (U23PHFC1)

Lecture Hours	**:**	**30 hrs**	**Tutorial Hours**	**: --**	
Practical Hours	**:**	**--**			
Contact Hours per Semester		**: 30hrs**	**No. of Credit : 2**		
Contact hours per Week		**: 2 hrs**			
Internal Marks		**: 50 Marks**			
Total Marks		**: 50 marks**			

OBJECTIVES OF THE COURSE

- 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.

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

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 coursesand understand their basis.

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

CO – PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COs	Program Outcomes(POs)							Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	3	3	3	2	3
CO2	3	3	2	3	2	2	3	2	3	3
CO3	2	1	3	3	2	3	1	3	2	1
CO4	1	2	3	2	2	3	1	2	2	3
CO5	3	2	1	3	2	1	3	2	1	3
Total contribution of CO to POs & PSOs	12	11	12	13	11	12	11	12	10	13
Weighted Percentage of COs contribution to POs & PSOs	80	73.33	80	86.67	73.33	80	73.33	80	66.67	86.67

1 - Low 2 - Medium 3 - High

COURSE CONTENT

UNIT – I (6 L hrs)

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 (6 L hrs)

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

UNIT – III (6 L hrs)

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

UNIT – IV (5 L hrs)

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 **(7 L hrs)**

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.BrijLal & N. Subrahmanyam, 2003, Properties of Matter, S.Chand & Co

REFERENCE BOOKS

1. H.R. Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition, S.Chan &Co.

WEBLINKS

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/

Part-III B.Sc. Physics / Semester – II / Core Lab 2 :

CORE PHYSICS PRACTICALS – II (U23PH2P2)

Lecture Hours	**:--**	**Tutorial Hours**	**: --**
Practical Hours	**: 45 hrs**		
Contact Hours per Semester	**:**	**45 hrs**	**No. of Credit : 3**
Contact hours per Week	**:**	**3 hrs**	
Internal Marks	**:**	**40 Marks**	
External Marks	**:**	**60 Marks**	
Total Marks	**:**	**100 Marks**	

OBJECTIVES OF THE COURSE

- 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 analyze, able to do error analysisand correlate results

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

CO1: understand the experimental ideas related with Heat, Oscillations, Waves and sound

CO2: develop the skill of performing experiments accurately and analyze observations.

CO3: by constructing the experimental setup and making meaningful conclusions.

CO - PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COS	Program Outcomes(POs)							Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	3	2	3	2	2	3	2	2
CO2	2	2	2	2	2	2	3	2	2	3
CO3	1	2	2	2	3	2	2	2	2	2
Total contribution ofCO to POs & PSOs	6	6	7	6	8	7	7	7	6	7
Weighted Percentage of COs contribution toPOs & PSOs	66.67	66.67	77.78	66.67	88.89	66.67	77.78	77.78	66.67	77.78

1 - Low 2 - Medium 3 - High

HEAT, OSCILLATIONS, WAVES and SOUND

Minimum of Eight Experiments from the list

1. Newton's law of cooling
2. Spectrometer –grating – N and λ normal incidence.
3. Air wedge- Thickness of a wire.
4. Determination of specific heat of liquid
5. Determination of thermal conductivity of good conductor by Searle's method.
6. Determination of thermal conductivity of bad conductor by Lee's disc method.
7. Determination of thermal conductivity of bad conductor by Charlaton's method.
8. Determination of specific heat capacity of solid.
9. Determination of specific heat of liquid by Joule's electrical heating method (applying radiation correction by Barton's correction/graphical method),
10. Helmholtz resonator.
11. Determination of velocity of sound using Kunds tube.
12. Determination of frequency of an electrically maintained tuning fork
13. To verify the laws of transverse vibration using sonometer.
14. To verify the laws of transverse vibration using Melde's apparatus.
15. To compare the mass per unit length of two strings using Melde's apparatus.
16. Frequency of AC by using sonometer.

Part-III B.Sc. Physics / Semester – II / Elective Generic Lab 2:
ALLIED PHYSICS PRACTICALS – II (U23PH2AP)

Lecture Hours	**:--**	**Tutorial Hours**	**: --**
Practical Hours	**: 30 hrs**		
Contact Hours per Semester	**:**	**30 hrs**	**No. of Credit : 1**
Contact hours per Week	**:**	**2 hrs**	
Internal Marks	**:**	**40 Marks**	
External Marks	**:**	**60 Marks**	
Total Marks	**:**	**100 Marks**	

OBJECTIVES OF THE COURSE

Apply various Physics concepts to understand concepts of Light, Electricity and Magnetism, waves and Electronics, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results.

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

CO1 understand the experimental ideas related with Light, Wave, Electricity and Magnetism and Electronics.

CO2 develop the skill of performing experiments accurately and analyze observations.

CO3 construct the experimental setup and making meaningful conclusions.

CO – PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COs	**Program Outcomes(POs)**							**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO 1**	**PSO2**	**PSO3**
CO1	3	2	3	2	3	2	2	3	2	3
CO2	2	2	2	2	3	3	3	2	3	1
CO3	1	2	2	2	2	2	2	2	3	2
Total contribution ofCO to POs & PSOs	6	6	7	6	8	7	7	7	8	6
Weighted Percentage of COs contribution to POs& PSOs	66.67	66.67	77.78	66.67	88.88	77.78	77.78	77.78	88.88	66.67

1 - Low 2 - Medium 3 - High

ALLIED PHYSICS PRACTICALS – II (U23PH2AP)

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 prism by minimum deviation.
5. Refractive index of liquid using Hollow 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 Zener/IC regulated power supply.
13. Construction of AND, OR, NOT gates using diodes and transistor.
14. NOR gate as a universal building block.
15. Determination of Earth's magnetic field using Tangent Galvanometer.
16. Series Resonance Circuit.
17. Parallel Resonance Circuit.
18. P – N Junction diode characteristics.

Part-III B.Sc. Physics / Semester – II / SEC- 2(NME - II) :
ASTRO PHYSICS- U23PH2S2

Lecture Hours	**:30 hrs**	**Tutorial Hours**	**: --**	**Practical Hours : -**	
Contact Hours per Semester	**:**	**30 hrs**		**No. of Credit : 2**	
Contact hours per Week	**:**	**2 hrs**			
Internal Marks	**:**	**50 Marks**			
Total Marks	**:**	**50 Marks**			

OBJECTIVES OF THE COURSE

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

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

CO1 recall the basics of Astrophysics.
CO2 understand the concept of Physics in space.
CO3 apply the learned concepts in exploring space science.
CO4 analyze the techniques for better understanding of space Physics.
CO5 interpret the observed properties of the known universe

CO – PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COs	**Program Outcomes(POs)**							**Program Specific Outcomes (PSOs)**		
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	3	2	2	2	2	2	3	1
CO2	3	2	2	2	3	3	2	1	2	2
CO3	2	2	1	1	2	2	1	2	2	2
CO4	2	2	2	2	1	3	2	3	2	3
CO5	3	3	2	2	3	2	2	2	2	3
Total contribution ofCO to POs & PSOs	12	11	12	9	11	12	9	10	11	11
Weighted Percentage of COs contribution to POs& PSOs	80	73.33	80	60	73.33	80	60	66.67	73.33	73.33

1 - Low 2 - Medium 3 - High

COURSE CONTENT

UNIT – TELESCOPES (5 L hrs)

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 (6 L hrs)

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

UNIT – III ECLIPSES (7 L hrs)

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

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

UNIT – IV STELLAR EVOLUTION (6 L hrs)

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

UNIT – V (6 L hrs)

GALAXIES: classification of galaxies – galaxy clusters –interactions of galaxies, darkmatter and super clusters – evolving universe.

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 two activities to be done compulsorily.

TEXT BOOKS

1.Baidyanath Basu, (2001). An introduction to Astrophysics, Second printing, Prentice – Hall ofIndia (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.

REFERENCE BOOKS

1. Astro Physics a modern perspective - K.S. Krishnasamy - New Age International (p) Ltd,New Delhi – 1st Edition, 2011.

2. Astronomy, ninth edition - Baker and Fredrick - Van No strand Rein hold, Co, New York

3. Fundamentals of Astronomy - Cesare Barbieri (Author), Ivano Bertini (Author) - CRCPress;

2nd edition (25 November 2020)

WEB LINKS

1.https://guides.lib.uchicago.edu/c.php?g=297346&p=1984885

2.https://www.nationalgeographic.com/science/article/origins-of-the-universe

Part-III B.Sc. Physics / Semester – II / SEC- 3(DS) :

HOME ELECTRICAL INSTALLATION (U23PH2S3)

Lecture Hours	**:**	**30 hrs**	**Tutorial Hours**	**: --**
Practical Hours	**:**	**--**		
Contact Hours per Semester	**:**	**30 hrs**	**No. of Credit : 2**	
Contact hours per Week	**:**	**2 hrs**		
External Marks	**:**	**50 Marks**		
Total Marks	**:**	**50 Marks**		

OBJECTIVES OF THE COURSE

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

COURSE LEARNING OUTCOMES

On completion of the course the students should be able to

CO1 recall the basics of electronics and enumerate the various components involved in electronic circuits.

CO2 interpret the electrical components such as resistors, capacitors, transformer and their uses.

CO3 apply the concepts learned and discover the new ideas related to electrical circuits and electronic appliances.

CO4 explain construction, working of various electrical components and appliances.

CO5 discuss the applications of various electrical components, circuits and its safety measures.

CO – PO & PSO MAPPING (COURSE ARTICULATION MATRIX)

COs	Program Outcomes(POs)							Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	3	3	2	3	1	2	3	2
CO2	2	2	2	2	3	2	2	1	2	3
CO3	2	3	2	3	2	3	2	2	3	2
CO4	2	1	2	3	2	1	2	3	3	2
CO5	3	3	2	2	3	2	2	2	1	2
Total contribution of CO to POs& PSOs	11	10	11	12	12	11	9	10	12	11
Weighted Percentage ofCOs contribution to POs & PSOs	73.33	66.67	73.33	80	80	73.33	60	66.67	80	73.33

1 - Low 2 - Medium 3 - High

COURSE CONTENT

UNIT – I SIMPLE ELECTRICAL CIRCUITS (6 L hrs)

Charge, current, potential difference, resistance – simple electrical circuits – DC ammeter, voltmeter, ohmmeter – Ohm's law – difference between DC and AC – advantagesof AC over DC – electromagnetic induction - transformers – inductors/chokes – capacitors/condensers – impedance – AC ammeter, voltmeter –symbols and nomenclature

UNIT – II TRANSMISSION OF ELECTRICITY (5 L hrs)

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 (6 L hrs)

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 tubelights 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 (6 L hrs)

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 (7 L hrs)

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
3. Upgrades - AFCI Protection - "Smart" Thermostats, by Editors of Cool Springs Press, (2018).
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