

203 - B. Sc. PHYSICS

Programme Structure and Scheme of Examination (under CBCS)
 (Applicable to the candidates admitted in Affiliated Colleges from
 the academic year 2022 -2023 onwards)

Course Code	Part	Study Components & Course Title	Hours /Week	Credit	Maximum Marks		
					CIA	ESE	Total
SEMESTER - I							
22UTAML11	I	Language Course - I : Tamil/Other Languages	5	3	25	75	100
22UENGL12	II	English Course - I : Communicative English I	5	3	25	75	100
22UPHYC13	III	Core Course - I: Properties of Matter and Sound	5	4	25	75	100
22UPHYC14		Core Course - II : Heat and Thermodynamics	5	4	25	75	100
		Core Practical - I	3	-	-	-	-
22UMATA01		Allied Course - I : Paper -1: Mathematics-I	5	4	25	75	100
22UENVS18	IV	Environmental Studies	2	2	25	75	100
Total			30	20			600
SEMESTER - II							
22UTAML21	I	Language Course - II : Tamil/Other Languages	5	3	25	75	100
22UENGL22	II	English Course - II : Communicative English II	5	3	25	75	100
22UPHYC23	III	Core Course - III : Mechanics	5	4	25	75	100
22UPHYP24		Core Practical - I	3	4	40	60	100
22UMATA02		Allied Course - I : Paper -2: Mathematics-II	5	4	25	75	100
22UPHYE26		Internal Elective - I	3	3	25	75	100
22UVALE27	IV	Value Education	2	1	25	75	100
22USOFS28		Soft Skill	2	1	25	75	100
Total			30	23			800

Internal Elective Courses

22UPHYE26	Internal Elective - I	Renewable Energy Sources
		Fundamentals of Physics
		Data Communication and programming in C

Allied Courses offered by the Department of Physics

22UPHYA01	Theory	Physics - I
22UPHYA02	Theory	Physics - II
22UPHYP02	Practical	Physics Practical - I

SEMESTER: I CORE COURSE: I PART: III	22UPHYC13: PROPERTIES OF MATTER AND SOUND	CREDITS: 4 HOURS: 60
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COURSE OBJECTIVES

1. To expound the fundamentals of elastic properties of solids.
2. To understand the surface properties of liquids and the experimental methods.
3. To explain the viscous properties of liquids and gases, Poiseuille's formula.
4. To elaborate the SHM, resonance phenomena, determination of frequency and loudness.
5. To get an idea of the ultrasonics generation method, reverberation, acoustics of buildings and use in oil and gas industry.

Unit I: Elasticity:**14 Hours**

Elasticity -- Hooke's law – Elastic moduli – Poisson's ratio – Beams – bending of beams – Expression for bending moment – Cantilever - Theory of uniform and non – uniform bending - Determination of Young's modulus - Koenig's method – Torsion of a body – Expression for couple per unit twist – Work done in twisting a wire – Torsional oscillations of a body - Rigidity modulus by dynamic torsion method (Torsional pendulum) and static torsion method.

Unit II: Surface Tension:**14 Hours**

Surface tension – definition – Molecular forces – Explanation of surface tension on kinetic theory – Surface energy – work done in increasing the area of a surface – Excess pressure inside a curved liquid surface – Excess pressure inside a spherical and cylindrical drops and bubbles - drop weight method - angle of contact - Quincke's method.

Unit III: Viscosity:**10 Hours**

Viscosity – Coefficient of viscosity – Streamlined and turbulent motion – critical velocity – Rate of flow of liquid in a capillary tube – Poiseuille's formula – viscosity of highly viscous liquid - terminal velocity - Stoke's method - Ostwald Viscometer - viscosity of gas - Mayer's formula.

Unit IV: Sound:**12 Hours**

Simple Harmonic Motion – Composition of two S.H.M in a straight line - at right angles -Lissajous's figures - Free, Damped, Forced vibrations - Resonance - Laws of transverse vibration of strings – Sonometer - Determination of AC frequency using sonometer - Decibels – Loudness and Intensity levels.

Unit V: Ultrasonics and Acoustics:**10 Hours**

Ultrasonics – Production – Piezoelectric crystal method – Magnetostriction method – Properties and Applications - Acoustics of building – Reverberation - Sabine's Reverberation formula (No derivation) - Factors affecting acoustics of building - Sound distribution in an auditorium - Requisites for good acoustics - application of sound in oil industry: seismic survey and sonic Log

COURSE OUTCOMES

On completion of the course, the student would have learnt the following:

1. Theory of Elasticity and bending of beams, Couple per unit twist of a wire, Torsional pendulum ideas.
2. have knowledge on surface properties of liquids and its determination methods.
3. Understood the viscous behaviour of liquids and gasses.
4. understood the Physics of sound and its applications
5. Learned the method of producing ultrasonic waves and its applications. The concepts of acoustic comfort and the theories used in building acoustics, use of sound in oil industry

Text Books

1. Mathur D.S, (2004) *Elements of properties of matter*, S. Chand & Co.,
2. Murugesan R. (2004) *Properties of matter* S. Chand & Co.,
3. Brijlal and Subramanian (2006) *Properties of matter* S. Chand & Co.,
4. Khanna D.R. and Bedi. R.S (1969) *Textbook of Sound*, Atmaram and sons
5. Subrahmanyam N and Brijlal (1995) *A Textbook of Sound*, Vikas Publishing House Second revised edition

Supplementary Readings

1. Gulati, H.R. (1982) *Fundamentals of General Properties of Matter*, S. Chand & Co., New Delhi.
2. Halliday D, Resnick and Walker J (2001), *Fundamentals of Physics*, 6th Edition, Wiley, New York.
3. Schlumberger (1991), *Basic Principles of logging*, Schlumberger Wireline & Testing, Texas

Web Resources

1. <https://www.pdfdrive.com/schlumberger-log-interpretation-principles-applicationspdf-e20509665.html>

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3
CO2	3	3	3	2	2
CO3	3	2	3	3	2
CO4	2	3	2	2	3
CO5	3	2	3	3	3

1- LOW, 2- MODERATE, 3- HIGH

SEMESTER: I CORE PAPER - II PART: III	22UPHYC14 HEAT AND THERMODYNAMICS	CREDIT:4 HOURS: 60
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COURSE OBJECTIVES

1. To get an idea about the specific heat capacity and its determination.
2. To understand the kinetic theory of gases and gas laws.
3. To get acquainted with transmission of heat and radiation laws.
4. To understand the low temperature Physics and Superconductivity.
5. To learn the thermodynamic system and its laws.

Unit-I: Specific Heat**12 Hours**

Specific heat capacity - Principle of method of mixtures - Specific heat capacity of liquid by method of mixtures - Newton's law of cooling - Specific heat capacity of a liquid by the method of cooling - Specific heat capacity of a liquid by Callender and Barne's method - Specific heat capacity of gases - Meyer's relation between C_p and C_v .

Unit -II: Kinetic theory of gases**12 Hours**

Kinetic theory of gases - Expression of pressure of gas - Boyle's law - Charle's law - Perfect gas equation - Mean free path - Expression for mean free path - Maxwell's velocity distribution law - Transport phenomena - Diffusion - Law of equipartition energy - Application to specific heat of gases.

Unit - III: Transmission of Heat**12 Hours**

Conduction - Coefficient of thermal conductivity - thermal conductivity of a good conductor - Forbe's method-thermal conductivity of a poor conductor - Lee's disc method - Convection and examples - Black body radiation - Wien's distribution law - Rayleigh - Jeans Law - Plank's Law - Stefan - Boltzmann law - determination of Stefan's constant - laboratory method

Unit - IV: Low Temperature Physics**12 Hours**

Joule-Kelvin effect - Porous plug experiment - liquefaction of hydrogen - liquefaction of helium - Kammerling - Onne's method - Helium I and II - Lambda point - Superconductivity - Type I and II superconductors - Meissner effect - applications of superconductors.

UNIT - V: Thermodynamics**12 Hours**

Thermodynamic system - Zeroth law, First and Second law of thermodynamics - Carnot engine - working and efficiency - Carnot's theorem - Thermodynamic scale of temperature - Thermodynamic and perfect gas scale - Third law of thermodynamics - Entropy - Change in entropy in a reversible/ irreversible process - Temperature entropy diagram - Entropy of perfect gas

COURSE OUTCOMES

1. After the completion this Course, the student would acquire the following:
2. get an idea about the specific heat capacity and its determination methods.
3. understood the kinetic theory of gases and gas laws.
4. get acquainted with transmission of heat process and radiation laws.
5. understood the method of generating low temperature and Superconductivity.

6. learnt the thermodynamic system and its associated laws.

Text Books:

1. Brij Lal and N Subrahmanyam (2016), *Heat Thermodynamics* S Chand & Company Pvt Ltd, New Delhi.
2. Murugesan R and KiruthigaSivaprasad (2002), *Thermal Physics*, S Chand & Co., New Delhi.

Supplementary Readings:

1. Mathur D S (2008), *Heat and Thermodynamics*, S Chand & Company Pvt Ltd.
2. Rajam J B (1990), *Heat and thermodynamics*, S Chand & Co., New Delhi.

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	2	3	3	2	2
CO3	3	2	3	3	2
CO4	2	3	2	2	3
CO5	3	2	3	3	3

CORRELATION LEVELS: 1- LOW, 2- MODERATE, 3- HIGH

SEMESTER:II CORE COURSE – III PART:III	22UPHYC23 MECHANICS	CREDIT: 4 HOURS: 60
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COURSE OBJECTIVES:

1. To learn the laws of conservation and collision of bodies
2. To understand and calculate the moment of inertia of different bodies
3. To know the laws of gravitation, variation of 'g' and gravitational field
4. To learn the central force motion, centre of mass, variable mass systems
5. To understand the friction, centre of gravity and flow of fluids

Unit I: Laws of Motion**14 Hours**

Laws of conservation of energy, linear momentum and angular momentum - work energy theorem - work done by gravitational force - work done by spring force - potential energy - conservative and non-conservative forces - potential energy curve- Collision - Elastic and inelastic collision - (Fundamental laws of impact) - Newton's law of impact - coefficient of restitution - Impact of a smooth sphere on a fixed plane - Direct impact between two smooth spheres - Oblique impact between two smooth spheres - Calculation of final velocities of the spheres - Loss of K.E due to impact.

Unit II: Dynamics of Rigid body**10 Hours**

Moment of inertia - Theorems of perpendicular and parallel axes - M.I of a circular ring, disc, solid sphere, hollow sphere and cylinder about all axes - Compound pendulum - theory - equivalent simple pendulum - reversibility of centers of oscillation and suspension - determination of g and k

Unit III: Gravitation**12 Hours**

Newton's law of gravitation - Kepler's laws of gravitation - Determination of G - Boy's method - Mass and density of earth - Acceleration due to gravity - Variation of g with altitude, depth and rotation of earth - Value of g at poles and equator. Gravitational field - Gravitational potential - Gravitational potential due to spherical shell - Gravitational potential due to a solid sphere (inside and outside)

Unit IV: Central Force Motion**12 Hours**

Angular velocity, angular momentum and K.E of rotation - Torque and angular acceleration - Relation between them - Expression for acceleration of a body rolling down an inclined plane without slipping. Center of mass -velocity and acceleration of centre of mass - determination of motion of individual particle-- system of variable mass. Rocket motion- Satellite

Unit V: Statics and Hydrodynamics**12 Hours**

Friction-laws of friction-angle of friction-cone of friction-Centre of gravity-solid and hollow tetrahedron-solid and hollow hemisphere -Centre of pressure - vertical rectangular lamina - vertical triangular lamina. Hydrodynamics - Equation of continuity- Pitot's tube and Venturimeter - Euler's equation of unidirectional flow - Torricelli's theorem - Bernoulli's theorem and its applications.

COURSE OUTCOME

After the completion of the Course the student would understand the following:

1. The laws of conservation and collision of bodies
2. Calculate the moment of inertia of rigid body systems
3. Laws of gravitation, variation of 'g' and gravitational field and potential
4. The central force motion, centre of mass and variable mass systems
5. The friction, centre of gravity and flow of fluids

Text Books:

1. Narayanamoorthy *Mechanics – Part I and II*, National Publishing Company.
2. Mathur D.S. (2001) *Mechanics*, S. Chand & Co., 2nd Edition.
3. Duraipandian P, Laxmi Duraipandian, Muthamizh, Jayapragasam, (1988),
4. *Mechanics*, S. Chand & Co., New Delhi.
5. Murugesan R (2001), *Properties of Matter*, S. Chand & Co., New Delhi.

Supplementary Readings

1. Halliday, Resnick, and Walker (2001) *Fundamentals of Physics*, 6th edition, Wiley, NY.

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	2
CO3	3	2	3	2	3
CO4	2	3	2	3	3
CO5	3	2	3	3	3

CORRELATION LEVELS: 1- LOW, 2- MODERATE, 3- HIGH

SEMESTER: I & II CORE PRACTICAL – I PART: III	22UPHYP24 PRACTICAL - I	CREDIT: 4 HOURS: 60
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COURSE OBJECTIVES:**To understand and learn the measurement of**

1. Elastic properties of solids.
2. Physical properties of liquids
3. Thermal properties of matter
4. Optical and electrical properties of materials and semiconductors
5. Frequency of vibration, relative density, and acceleration due to gravity

List of Experiments (Any 15 Experiments only)

1. Compound Pendulum - Determination of 'g' and 'k'.
2. Young's modulus - non uniform bending -Pin and microscope.
3. Young's modulus - uniform bending – Pin and microscope.
4. Young's modulus cantilever – depression - dynamic method-Mirror, Scale and Telescope.
5. Rigidity modulus -Torsional Pendulum -without masses.
6. Rigidity modulus and moment of inertia -Torsional Pendulum - with identical masses.
7. Rigidity modulus -Static torsion -Mirror, Scale and telescope.
8. Surface tension and Interfacial surface tension - drop weight method.
9. Coefficient of viscosity of liquid - Graduated burette - Radius of capillary tube by using microscope.
10. Specific heat capacity of liquid -Newton's law of cooling.
11. Sonometer - Frequency of Tuning fork.
12. Sonometer - Relative density of a solid and liquid.
13. Focal length - R and μ of a convex lens [focal length i) u-v and ii) conjugate foci method; Radius of curvature by telescope method].
14. Focal length - R and μ of a concave lens [focal length i) in contact and ii) auxiliary lens method; Radius of curvature by Boy's method].
15. Spectrometer - Solid prism- Refractive index of material of a prism.
16. Spectrometer - Hollow prism – Refractive index of a liquid.
17. Potentiometer - Calibration of low range voltmeter.
18. Potentiometer - Internal resistance of a Cell.
19. Study of Characteristics of the Junction diode – Determination of knee voltage
20. Study of Characteristics of the Zener diode – Determination of reverse breakdown voltage

COURSE OUTCOMES

The student will be learnt to determine the following physical properties:

1. Elastic properties of solids.
2. Physical properties of liquids
3. Thermal properties of matter
4. Optical and electrical properties of materials and semiconductors
5. Frequency of vibration, relative density, and acceleration due to gravity

Text Books:

1. Ouseph, C.C. Rao, U.J. Vijayendran,V. (2018), *Practical Physics and Electronics*, S. Viswanathan, Printers & Publishers Private Ltd, Chennai
2. Srinivasan, M.N, Balasubramanian,V, Ranganathan, R. (2015) *A Text Book of Practical Physics*, Sultan Chand & Sons, New Delhi

Supplementary Readings:

1. Samir Kumar Ghosh (2000) *A Textbook of Advanced Practical Physics*, NCBA Kolkatta
2. Chattopadyay, D. Rakshit, P.C. (2011), *An Advanced Course in Practical Physics*, NCBA, Kolkatta,
3. Arora, C.L, *B.Sc. Practical Physics*,S. Chand and Company, New Delhi.
4. Khandelwal,V, *A Laboratory Manual of Physics for Undergraduate Classes*, Vani Publications.
5. Saraf. B. et al, *Physics through Experiments*, Vikas Publications.
6. Harnaam Singh., *B.Sc., Practical Physics*, S. Chand and Company, New Delhi.
7. Tayal, D C, *University Practical Physics*, Himalaya Publishing House.
8. Gupta & Kumar, *Practical Physics*, Pragati Prakashan, Meerut

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2
CO2	2	3	2	3	2
CO3	3	2	3	2	2
CO4	3	3	2	2	3
CO5	2	2	3	2	3

Correlation Level: 1-Low, 2-Moderate, 3-High

SEMESTER: II PART: III	22UPHYE26 - 1 Internal Elective – I - (1) RENEWABLE ENERGY SOURCES	CREDIT: 3 HOURS: 45
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COURSE OBJECTIVES

1. To provide an understanding of the present energy crisis and various available energy sources.
2. To understand the harvesting of solar energy.
3. To know the basics of photovoltaic system and its applications.
4. To learn about the biogas and biomass energy.
5. To understand the alternative energy sources and their details.

UNIT I: Introduction to Energy Sources**Hours: 9**

World's reserve of Commercial energy sources and their availability - India's production and reserves - Conventional and non - conventional sources of energy, comparison – Coal- Oil and natural gas –applications - merits and demerits.

UNIT II: Solar Thermal Energy**Hours: 9**

Solar constant -Solar spectrum - Solar radiations outside earth's atmosphere –at the earth surface - on tilted surfaces - Solar Radiation geometry - Basic Principles of Liquid flat plate collector –Materials for flat plate collector - Construction and working - Solar distillation–Solar disinfection - Solar drying - Solar cooker(box type) - Solar water heating systems – Swimming pool heating.

UNIT III: Photovoltaic Systems**Hours: 9**

Introduction - Photovoltaic principle - Basic Silicon Solar cell - Power output and conversion efficiency - Limitation to photovoltaic efficiency - Basic photovoltaic system for power generation - Advantages and disadvantages - Types of solar cells - Application of solar photovoltaic systems- PV Powered fan – PV powered area - lighting system – A Hybrid System.

UNIT IV: Biomass Energy**Hours: 9**

Introduction - Biomass classification - Biomass conversion technologies - Bio - gas generation - Factors affecting bio - digestion - Working of biogas plant - floating and fixed dome type plant- advantages and disadvantage of -Bio - gas from plant wastes - Methods for obtaining energy from biomass - Thermal gasification of biomass - Working of downdraft gasifier - Advantages and disadvantages of biological conversion of solar energy.

UNIT V: Wind Energy and Other Energy Sources**Hours: 9**

Wind Energy Conversion - Classification and description of wind machines, wind energy collectors - Energy storage - Energy from Oceans and Chemical energy resources - Ocean thermal energy conversion - tidal power, advantages and limitations of tidal power generation - Energy and power from waves- wave energy conversion devices - Fuel cells - and application of fuel cells - batteries advantages of battery for bulk energy storage - Hydrogen as alternative fuel for motor vehicles.

COURSE OUTCOMES

After Completion of the course, the student would have learnt the ideas listed below

1. Knowledge of Conventional and non-conventional energy sources.
2. Understand the solar energy and the harvesting methods.
3. Gain knowledge about power generation and solar cells.
4. Acquainted with the conversion of biogas and its application.
5. Familiar with the alternative types of energy and their advantages.

Text Books:

1. Kothari D.P, Singal K.C. and Rakesh Ranjan, 2008, *Renewable energy sources and emerging Technologies*, Prentice Hall of India,
2. Sukhame, S.P. *Solar Energy - principles of thermal collection and storage*, Tata McGraw Hill Publishing Company Ltd.

Supplementary Readings:

1. Chetan Singh Solanki, 2011, *Solar Photovoltaics Fundamentals, Technologies and Applications*, 2nd Edition, PHI Learning Private Limited.
2. Rai G. D, 2010, *Non-conventional Energy sources*, 4th Edition, Khanna Publishers.
3. Jeffrey M. Gordon 2013, *Solar Energy: The State of the Art*, Earthscan.
4. Kalogirou S.A., 2013, *Solar Energy Engineering: Processes and Systems*, 2nd Edition, Academic Press.
5. Zobia A. F and Ramesh Bansal, 2011, *Handbook of Renewable Energy Technology*, World Scientific.

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	2	2	2	3	2
CO4	2	3	3	2	3
CO5	3	2	2	3	3

CORRELATION LEVELS: 1- LOW, 2- MODERATE, 3- HIGH

SEMESTER: II PART: III	22UPHYE26 - 2 Internal Elective – I (2) FUNDAMENTALS OF PHYSICS	CREDIT: 3 HOURS: 45
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COURSE OBJECTIVES

1. To know the units, dimensions and measurement of various physical quantities.
2. To acquire knowledge on different states of matter and conversion between them.
3. To know different types of energy.
4. To know about pressure, temperature and their simple measuring devices.
5. To understand principles of mirrors and lenses

Unit I: Units and Measurements**9 Hours**

S.I. Units – measurement of length, mass, time and other physical quantities
 - Dimensional formula for area, volume, density, velocity, acceleration, momentum and force – Impulse – Torque – couple – angular momentum – Uses of dimension.

Unit II : States of matter**9 Hours**

Matter – Solid, Liquid, Gas and Plasma – Application of Plasma – change of state – specific heat capacity – specific heat capacity of gas - latent heat of fusion and vaporisation - specific latent heat of ice and steam.

Unit III :Energy**9 Hours**

Kinds of energy – Mechanical energy, Thermal energy, Optical energy, Sound energy, Electrical energy, atomic and nuclear energy, (Examples) – Conservation of energy – work energy theorem.

Unit IV: Pressure and Temperature**9 Hours**

Pressure – atmospheric pressure – Fortin barometer – Aneroid barometer - Concept of heat and temperature – Centigrade, Fahrenheit and Rankine scale – relation between temperature scales - Mercury thermometer – Error and corrections in mercury thermometers – Platinum wire resistance thermometer

Unit V : Mirror and lens**9 Hours**

Mirror – Laws of reflection – total internal reflection – Image formation (Concave and Convex mirror) - Lens – Laws of refraction – Image formation (Concave and Convex lens) – Defects of eye and rectification – Rayleigh, Mie, Tyndall and Raman scattering of light

COURSE OUTCOMES

Students studying Fundamentals of Physics course would have learnt the following:

1. units and dimensions of various fundamental physical quantities
2. different states of matter and conversion between them.
3. types of energy and its conservation.
4. pressure and temperature and their measurement using simple devices.
5. principle and use of mirrors, lenses and scattering of light.

Text Books:

1. Narayan Rao, (1998), B V, *First Year B. Sc. Physics*, New Age International (P) Lt.

Supplementary Readings:

1. Halliday, D, Resnick R and Walker J, (2011), *Fundamentals of Physics*, Wiley India, Pvt Ltd.
2. Mathur, D S (2002), *Mechanics*, S. Chand & Co. Mathur, D S (2002), *Properties of matter*, S. Chand & Co., Brijlal and Subramanian, (2006), *Properties of matter*, S. Chand & Co., Rai, G D, *Solar energy utilization*, Khanna Publishers. Subramanyam and Brijlal (2004), *A text book of Optics*, S. Chand and co., 22nd Edition.
3. Murugesan, R (2008), *Optics and Spectroscopy*, S. Chand and co., 6th Edition.

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	2	2
CO3	2	3	2	3	2
CO4	3	2	3	3	3
CO5	2	3	2	2	3

CORRELATION LEVELS: 1- LOW, 2- MODERATE, 3- HIGH

SEMESTER: II PART: III	22UPHYE26-3 Internal Elective – I (3) DATA COMMUNICATION AND PROGRAMMING IN C	CREDIT: 3 HOURS: 45
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COURSE OBJECTIVES

1. To learn the different aspects of digital data communication and networks
2. To understand the art of multiplexing signals and its advantages and applications.
3. To get to know the ideas about broadband, layers, repeaters, bridges and gateway
4. To get acquainted with the keywords, operators, expressions and functions in C program.
5. To study the input and output, branching, loop, arrays etc., in C program.

Unit I:Data Communication**Hours: 9**

Introduction to Data Communication - Network, protocols and standards standard organizations - line configuration - topology- transmission mode - classification of network.

Unit II: Transmission**Hours: 9**

Parallel and serial transmission - Interface standards - modems-guided media types of error - Multiplexing - Types of Multiplexing - Multiplexing application Telephone system – ether net.

Unit III: Network Access**Hours: 9**

Analog and digital network: Access to ISDN-broadband ISDN-X.25 Layers- Atm – Repeater – Bridges – Routers – Gateway - TCP/IP Network - World Wide Web.

Unit IV:Introduction to Programming in C**Hours: 9**

Basic structure of C Program – character set – identifiers and keywords constants and variables - data types – operators and expressions – Relational, Logical and Assignment operators – increment and decrement operators – Arithmetic expressions – Mathematical functions.

Unit V: Preliminaries And Functions**Hours: 9**

Data input and output – getchar, putchar, scan f, print f, gets, puts functions – Decision making – branching and looping – if, if-else, else if ladder, switch, break, continue, goto – while, do while – for, nested loops – Arrays (one dimensional and two dimensional) – declaration – initialization – simple programs.

COURSE OUTCOMES**After finishing this course, the student will be knowing:**

1. the different aspects of digital data communication and networks
2. the art of multiplexing signals and its advantages and applications.
3. The ideas about broadband, layers, repeaters, bridges and gateway
4. the keywords, operators, expressions and functions in C program.
5. the input and output, branching, loop, arrays etc., in C program.

Text books:

1. Balagurusamy.E, (2008), *Programming in ANSI C*, Second Edition, Tata McGraw Hill.
2. Brijendra Singh, *Data, Communications, and Computer Networks*, second edition, PHI

Supplementary Readings:

1. KamthaneAshok.N, (2013), *Programming in C*, 2nd Edition, Pearson Education.
2. Yashvant P. Kanetkar, (2008), *Let us C*, 8th Edition, Infinity science press.

OUTCOME MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	2	3	2	3	3
CO4	3	3	3	3	2
CO5	3	2	3	2	3

CORRELATION LEVELS: 1- LOW, 2- MODERATE, 3- HIGH