MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. Physics

(Choice Based Credit System)

(with effect from the academic year 2016-2017 onwards)

(44th SCAA meeting held on 30.05.2016)

Sem.	Pt. I/II/ III/ IV/ V	Sub No.	Subject status	Subject Title	Hrs./ week	Cre-dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
III	I	17	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	18	Language	English	6	3	25	75	100	30	40
	III	19	Core - 5	ELECTRICITY AND MAGNETISM	4	4	25	75	100	30	40
		20	Practical – III	(Practical List enclosed) (No examination in the third Semester)	2	-	50	50	100	20	40
		21	Allied -III	ALLIED PHYSICS – I	4	4	25	75	100	30	40
		22	Allied Practical-III (No examination in the third Semester)	ALLIED PRACTICALS I & II/III & IV SEMESTERS)	2	-	50	50	100	20	40
	IV	23	Skilled Based subject-I	(A)MAINTANACE OF ELECTRICAL APPLICANCES (or) (B) ASTROPHYSICS	4	4	25	75	100	30	40
	IV	24	Non-Major Elective-I	(A)BASIC PHYSICS - I (OR) (B) ENERGY PHYSICS	2	2	25	75	100	30	40
				Sub-total	30	20					

Sem.	Pt. I/II/ III/ IV/V	Sub. No.	Subject status	Subject Title	Hrs. / week	Cre-dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	I	25	Language	Tamil/Other Language	6	3	25	75	100	30	40
	II	26	Language	English	6	3	25	75	100	30	40
	III	27	Core - 6	COMPUTER PROGRAMMING IN C++	4	4	25	75	100	30	40
		28	Major Practical-IV	PRACTICAL - II	2	2	50	50	100	20	40
		29	Allied -IV	ALLIED PHYSICS - II	4	4	25	75	100	30	40
		30	Allied Practical-IV	ALLIED PRACTICALS I & II/III & IV SEMESTERS)	2	2	50	50	100	20	40
	IV	31	Skill Based Subject -II	(A)MAINTANACE OF ELECTRONIC APPLIANCES (or) (B)PHYSICS OF HUMAN ANATOMY	4	4	25	75	100	30	40
	IV	32	Non-Major Elective-II	(A)BASIC PHYSICS - II (OR) (B) SPACE PHYSICS	2	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
Subtotal					30	25					

ELECTRICITY AND MAGNETISM

UNIT-I: **ELECTRO MAGNETIC INDUCTION**

Laws of Electromagnetic Induction - Self induction - Self inductance of a long solenoid - Determination of L Rayleigh's method - Owens bridge - Mutual induction - mutual induction between two co-axial solenoids - Experimental Determination of mutual inductance between a pair of coils - Co efficient of coupling - Energy stored in a coil

UNIT-II: **TRANSIENT CURRENT**

Growth and decay of current in a circuit containing inductance L and resistance R - Growth and decay of charge in a capacitance - resistance (CR) circuit - Determination of high resistance by leakage - Growth and decay of charge in a LCR circuit - conditions for the discharge to be oscillatory - frequency of oscillation.

UNIT-III: **ALTERNATING CURRENT**

Alternating Current - j operator method - use of j operator in the study of AC circuits - resistance in an AC circuit - Inductance in an AC circuit - Capacitance in an AC circuit - AC through an inductance and resistance in series - AC through a capacitance and resistance in series - LCR in series resonance circuit - sharpness of resonance - parallel resonance circuit - power in an AC circuit-power factor.

UNIT-IV: **THERMO ELECTRICITY**

Seebeck effect - thermo emf - neutral temperature - temperature of inversion - Law of thermo electric effects - measurement of emf of a thermocouple with potentiometer - Peltier effect - Thomson effect - Thermodynamics of a thermo couple - Thermo electric power diagram - Application of thermo electric power diagram.

UNIT-V: **MAGNETIC FIELDS AND MAXWELL'S EQUATION**

The three magnetic vectors M, B, and H - Relation between them - Permeability and Susceptibility - relation between them - moving coil BG - construction - theory - correction for damping - measurement of charge sensitiveness - absolute capacity - De-Saughty's bridge.

Displacement current - Maxwell's equations - Boundary conditions -Poynting vector - Electromagnetic waves in free space - Hertz experiment for production and detection of EM waves.

Books for study

1. Electricity and Magnetism - R. Murugesan (S.Chand &Co.)

Books for Reference

1. Electricity and Magneti - K.K.Tiwari (S.Chand &Co.)

2. Elecrodynamics - David J Griffith

3. Electricity and Magnetism - D.N.Vasudeva (Twelfth revised edition)

4. Fundamentals of Physics, 6th Edition, by D Halliday, R Resnick and J Walker. Wiley NY 2001.

5. Electricity and Magnetism - E.M.Pourcel, Berkley Physics Cource, Vol.2 (Mc Grraw-Hill)

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/ Semester-III/Ppr.no.20/ Major Practical – III

(12 experiments compulsory)

1.Field along the axis of a coil carrying current –defiection magnetometer

2.Potentiometre-calibration of volt meter(low range)

3. Potentiometre-calibration of ammeter

4. Potentiometer-thermo emf

5. Potentiometer-comparison of resistances and specific resistivity

6.Series resonance circuit

7.Parallel resonance circuit

8.Figure of merit-Ballistic Galvanometre

9.Comparison of EMF's and Capacitances- Ballistic Galvanometre

10.Owens bridge

11.De-sauty bridge

12.Carey foster's bridge-temperature co-efficient of resistance

13.Deflection&Vibration Magnetometre-M&B $_H$

14.Spectrometre-i-d curve

15. Spectrometre-grating-oblique incidence

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester –III/Ppr.no.21/ Allied – III

ALLIED PHYSICS -I

Unit I : Elasticity and bending moment

Hooke's law – Elastic moduli – Relation between elastic constants – Work done in stretching a wire – Expression for bending moment - uniform bending- Experiment to determine Young's modulus using pin and microscope-Twisting couple of a wire – Expression for couple per unit twist – Work done in twisting – Experimental determination of rigidity modulus of a wire using Torsion pendulum with theory

Unit II: Surface tension and Viscosity

Surface tension – Definition – Examples – Molecular interpretation – Expression for excess of pressure inside a synclastic and anticlastic surface-Application to spherical and cylindrical drops and bubbles

Viscosity: Coefficient of viscosity – Rate of flow of liquid in a capillary tube (Poisueuille's formula) – Analogy between liquid flow and current flow – Stokes' formula for highly viscous liquids (Dimension method) – Experimental determination of viscosity of highly viscous liquid (stokes' method)

Unit III: Sound: Simple harmonic motion – Free, damped ,forced vibrations and resonance – Composition of two SHMs along a straight line and in perpendicular direction – Melde's string experiment – Determination of frequency of tuning fork(both longitudinal and transverse mode)

Unit IV : Thermal physics : Mean free path- Expression for mean free path (Zero order approximation) – Transport phenomena – Expression for viscosity and thermal conductivity – Conduction in solids – coefficient of thermal conductivity – Lee's disc method to determine thermal conductivity of a bad conductor – Wiedmann – Franz's law – Convection : Newton's law of cooling – Experimental verification – Radiation : Black body radiation – Distribution of energy in black body spectrum – Important features.

Unit V: Optics

Interference: Condition for interference-Air wedge-determination of thickness of a thin wire by air wedge

Diffraction: Fresnel & Fraunhofer diffraction-Plane diffraction grating- theory and experiment to determine wavelength (normal incidence)

Polarization: Double refraction- half wave and quarter wave plate – Production and detection of plane, elliptically and circularly polarized light.

Books for study

1. Optics – Brijlal & Subramanian

2. Properties of matter – R.Murugesan

3. Heat & Thermodynamics – D.S.Mathur

Reference Books

1.Heat and thermodynamics - Brijlal & Subramanian, S Chand & Co., New Delhi

2.Fundamentals of Optics by Jenkins A Francis and White E Harvey, McGRaw Hill Inc., New Delhi, 1976.

3. Elements of Properties of Matter by Mathur D S, Shyamlal Charitable Trust, New Delhi, 1993

MSU/2016-17/UG-Colleges/Part-III (B.Sc.Physics)/Semester -III & IV/Ppr.no.22/ Allied Practicals –III

ALLIED PHYSICS

LIST OF PRACTICALS

(12 experiments compulsory)

1. Young's modulus- Uniform bending- Microscope
2. Young's modulus - Non-uniform bending- Telescope
3. Rigidity modulus- Torsion pendulum
4. Viscosity of highly viscous liquid- Stokes' method
5. Viscosity- Variable pressure head- graduated burette method
6. Lee's Disc- K of Cardboard
7. Potentiometer- Calibration of voltmeter(low range)
8. Potentiometer- Calibration of ammeter
9. Series resonance circuit
10. Basic logic gates- OR, AND& NOT(using descrete components)
11. Zener diode charecteristics
12. Melde's string –frequncy of a tuning fork.
13. Spectrometer-refractive index of solid prism
14. Spectrometer- grating- normal incidence method
15. Air wedge- Thickness of wire

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester-III/Ppr.no.23(A)/ Skilled Based -1(A)

MAINTANANCE OF ELECTRICAL APPLIANCES

UNIT-I: Resistance - capacitance - inductance and its units - Electrical charge - current - potential - units and measuring meters - Ohm's law - Galvanometer, ammeter, voltmeter and multimeter. Electrical energy - power - watt - kWh - consumption of electrical power.

UNIT-II: Transformer - principle and working - classification of transformers - testing of transformers - Core, Shell and Berry types, auto transformer - construction and uses. Cooling of transformers - Losses in transformer.

Unit-III: Electrical bulbs – Fluorescent lamps - Street Lighting - Electrical Fans - Wet Grinder - Mixer - Water Heater - Storage and Instant types, electric iron box, microwave oven - Washing Machine - Stabilizer, fridge and Air conditioner.

UNIT-IV: AC and DC- Single phase and three phase connections - RMS and peak values, House wiring - Star and delta connection - overloading - earthing - short circuiting - colour code for insulation wires -

UNIT-V: Electrical protection - Relays - Fuses - Electrical switches - Circuit breakers, ELCB - overload devices - ground fault protection - Inverter - UPS - generator and motor

Books for study and Reference

1. A text book in Electrical Technology - B L Theraja - S Chand & Co.
2. A text book of Electrical Technology - A K Theraja
3. Performance and design of AC machines - M G Say ELBS Edn.
4. Semi conductor physics and opto electronics by P K Palanichamy
5. Basic Electronics - B L Theraja - S Chand & Co.
6. Principles of Communication Engineering - Arokh Singh and A K Chhabra - S Chand & Co.

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)Semester-III/Ppr.no.23(B)/ Skilled Based - I (B)

ASTROPHYSICS

UNIT-I : Astronomical instruments

Optical telescope - reflecting telescope - types of reflecting telescope - advantages of reflecting telescope - Radio telescopes - astronomical spectrographs - photographic photometry - photo electric photometry - detectors and image processing.

UNIT-II : Solar system

The sun-physical and orbital data - Photosphere - Chromosphere - corona - solar prominences - sunspot - sunspot cycle - theory of sunspots - solar flare - mass of the sun - solar constant - temperature of the sun - source of solar energy - solar wind. Other members of the solar system - Mercury - Venus - Earth - Mars - Jupiter - Saturn - Uranus - Neptune - Pluto - Moon - Bode's law - Asteroids - comets - Meteors.

UNIT-III: Stellar Evolution, Binary and variable stars

Birth of a star - Death of a star - Chandrasekhar limit - white dwarfs - Neutron stars - black holes - Quasars - Nebulae - Supernovae

Binary stars - Origin of Binary stars. Variable stars - Cepheid variables - RV Tauri variables - long period variables - irregular variables - flare stars.

UNIT-IV : Magnitudes, distance and spectral classification of stars

Magnitude and brightness - apparent magnitude of stars - absolute magnetic of stars - relation between apparent magnitude and absolute magnitude of stars - Luminosities of stars - measurement of stellar distance - Geometrical parallax method - distance from red shift measurement - Harvard system of spectral classification .

UNIT-V :Theories of the universe, galaxies and star clusters

Origin of the universe - the big bang theory - the steady state theory - the oscillating universe theory - Hubble's law.

Galaxies - types of galaxies - Milky Way - star clusters - open clusters - globular clusters.

Books for study and reference:

1. K.S. Krishnasamy, ‘Astro Physics a modern perspective,’ Reprint, New Age International (p) Ltd, New Delhi,2002.

2. Baidyanath Basu, ‘An introduction to Astro physics’, second printing, prentice - Hall of India Private limited, New Delhi,2001.

3. R. Murugesan, ‘ Modern Physics’, Eleventh revised edition, S. Chand & Company Ltd, New Delhi, 2003.

4. S. Kumaravelu, ‘Astronomy, Janki calendar corporation, Sivakasi, 1993

5. Baker and Fredrick, ‘Astronomy, ninth edition, Van No strand Rein hold, Co, New York - 1964.

6. Illustrated World of Science Encyclopedia - Vol I and Vol VIII - Creative world publication - Chicago.

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-III/Ppr.no.24(A)/ Non Major Elective – 1 (A)

BASICPHYSICS - 1

UNIT I : MECHANICS

Motion-speed,velocity,acceleration- force –equations of motion- Newton's laws - momentum - work, power and energy - energy –conservation of energy and momentum.

UNIT II : PROPERTIES OF MATTER

Three states of matter - binding forces - fluid pressure and thrust - applications - Pascal law - Archimedes principle – surface tension-capillary action - Bernoulli's principle – Viscosity-venturimetre-pitot's tube.

UNIT III : HEAT AND SOUND

Measurement of heat and temperature - clinical thermometer - heat transfer - thermos flask - change of state - effect of pressure on boiling point and melting point - heat engines - steam engine and diesel engine. sound and music - reverberation - acoustics of building - recording and reproduction of sound in film.

UNIT IV : OPTICS

Reflection and refraction-Concave and convex mirrors and lenses-dispersion- spectra- rainbow-Interference-diffraction-polarization-concepts with examples-uses-double refraction-optical activity-quartz crystal

UNIT V: ELECTRICITY

Electric field - potential - Ohm's law - electrical energy and power - resistance - types of resistance - fixed resistance - variable resistance.- resistance in series and parallel -Kirchoff's laws

Books for study and Reference:

1. Properties of matter by Murugeshan R, S Chand & Co. Pvt. Ltd., New Delhi

2. Text book of sound by Brij Lal & Subramaniam, N Vikas Publishing House, New Delhi, 1982

3. Electricity and Magnetism - R. Murugesan. (S.Chand &Co.)

4. Heat and thermodynamics - Brijlal and Subramaniyam, S Chand & Co.

5.Optics by Subramaniam N & Brij Lal, S Chand & Co. Pvt. Ltd., New Delhi,1990

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-III/Ppr.no.24(B)/
Non Major Elective – I (B)

ENERGY PHYSICS

UNIT-I: Conventional energy sources

Conventional energy sources –world's reserve of Conventional energy sources–various forms of energy-renewable and conventional energy systems-comparison

UNIT-I I: Fossil fuels

Fossil fuels – coal,oil and natural gas-availbility-stastical details-applications-merits and demerits

UNIT-III :Biomass energy

Biomass energy-biomass classification-biomass conversion process-biogas plants-deena bandhu model gas plant-wood gasification-advantages and disadvantages of biomass

UNIT-I V :Renewable energy sources

Renewable energy sources-Solar energy - importance - storage of solar energy - applications of solar energy -solar pond - , solar water heater, solar crop dryers-solar cookers- solar green houses - solar cell

UNIT-V :Geothermal energy

Geothermal energy-Geothermal power plant-wind energy and wind farms- wind mills - types – ocean thermal energy conversion - energy from tides-energy from waves

Books for study and Reference

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi

2. Solar energy - M P Agarwal - S Chand & Co. Ltd.

3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd., New Delhi.

COMPUTER PROGRAMMING IN C^{++}

UNIT-I: **WHAT IS C^{++}**

Introduction - tokens - keywords - identifiers and constants - declaration of variables - basic data types - user defined data types-derived data types - symbolic constants - operators in C^{++} - scope resolution operator - expressions and their type - special assignment operators - all control structures.

UNIT-II: **FUNCTIONS IN C^{++}**

Introduction - main function - function prototyping - inline functions - default arguments - function overloading - friendly functions - virtual functions - math library functions.

UNIT-III: **CLASSES AND OBJECTS**

Introduction - specifying a class - defining member functions-a C^{++} program with class - nesting of member functions - private member functions - objects as function arguments - constructors - parameterized constructors-multiple constructors - constructors with default arguments - copy constructor.

UNIT-IV: **OPERATOR OVERLOADING**

Introduction - defining Operator overloading - Operator overloading unary operators - overloading binary operators - inheritance - single inheritance - multiple inheritance - multi level inheritance - hybrid inheritance - hierarchial inheritance.

UNIT-V: **MANAGING CONSOLE I/O OPERATIONS**

Introduction - C^{++} stream - C^{++} stream classes - unformatted I/O Operations -formatted console I/O operations - working with files - classes for file steam operations - opening and closing a file - file pointers and their manipulations.

Books for study

1. Object oriented Programming with C^{++} - E.Balagurusamy, Tata Mc Graw-Hill publishing company Ltd. New Delhi

Books for reference

1. Programming with C^{++} - D.Ravichandran, Tata Mc Graw-Hill publishing company Ltd. New Delhi .
2. Object oriented Programming in C^{++}-4 th Edn.Robert Lafore-Macmilan publishing company Ltd.
3. Fundamentals of Programming with C^{++} -Richardl.Halterman

PRACTICAL - II (12 experiments compulsory)

1. Field along the axis of a coil carrying current –defiection magnetometer
2. Potentiometre-calibration of volt meter(low range)
3. Potentiometre-calibration of ammeter
4. Potentiometer-thermo emf
5. Potentiometer-comparison of resistances and specific resistivity
6. Series resonance circuit
7. Parallel resonance circuit
8. Figure of merit-Ballistic Galvanometre
9. Comparison of EMF's and Capacitances- Ballistic Galvanometre
10. Owens bridge
11. De-sauty bridge
12. Carey foster's bridge-temperature co-efficient of resistance
13. Deflection&Vibration Magnetometre-M&B $_H$
14. Spectrometre-i-d curve
15. Spectrometre-grating-oblique incidence

ALLIED PHYSICS –II

Unit I: Electricity

Current and current density – Expression for current density – Ohm's law – Resistors in series and in parallel – I-V characteristic of a resistor – Color coding – Conversion of a galvanometer into an ammeter and voltmeter – Kirchoff's laws – Application of Kirchoff's laws in Wheatstone network – sensitiveness of bridge.

Unit II: Electromagnetism

Magnetism: Definition of magnetic induction B, Magnetic field intensity H , Intensity of magnetization M – Relation connecting M, B and H – Magnetic permeability μ and magnetic susceptibility K – Relation between μ and K – Properties of Dia, Para and Ferro magnetic materials. Electromagnetism: Faraday's law of electromagnetic induction – Lenz's law – Expression for induced current and charge – Self inductance – Self inductance of a long solenoid – Determination of self inductance by Rayleigh's method –Mutual inductance – Coefficient of coupling – Determination of mutual inductance using BG.

Unit III: Electronics

Junction diodes-forward and reverse bias-diode charecteristics- Zener diode – VI characteristic of a Zener diode – Transistors-Charecteristics of a transistor(common emitter mode only). Digital Electronics: Decimal and binary numbers – binary to decimal and decimal to binary-Binary addition – Binary subtraction by 1's and 2's complement method – Basic logic gates OR, AND, NOT (Symbol, Boolean equation, truth table, circuit and working) – NAND, NOR, EX-OR(Symbol, Boolean equation , truth table only) – De Morgan's theorem.

Unit IV: Nuclear physics

Introduction – Classification of nuclei – General properties of nucleus – Nuclear size, Nuclear mass, Nuclear density, Nuclear charge, Nuclear spin & Nuclear magnetic dipole moments – Mass defect – Binding energy - Binding energy curve – Nuclear forces – Properties – Fundamental laws of radioactivity – Soddy Fajan's displacement law – Law of radioactive disintegration – Half life period – The mean life.

Unit V: Mechanics and Relativity

Projectiles – Time of flight – Range on the horizontal plane – Greatest height attained by the projectile – Path of the projectile– Range on an inclined plane – Relativity: Frames of references – Postulates of special theory of relativity – Galilean & Lorentz transformation equations – Length contraction – Time dilation.

Books for study

1. Electricity and Magnetism – R.Murugesan
2. Modern physics – R. Murugesan
3. Principle of Electronics – V.K.Mehta
4. Digital principles and applications - Albert Paul Malvino & Donald P.Leach
5. Mechanics – D.S.Mathur

Reference Books

1.Modern Physics- Seghal Chopra & Seghal, Sultan chand 1998 Electricity and Magneti - **K**.K.Tiwari (S.Chand &Co.)

2.Electronic fundamentals and applications-John D.Ryder –Prentice Hall

3. Electronic principles-Malvino

4. Electricity and Magnetism – Vasudeva

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Ppr.no.30/
Allied Practical –III & IV

LIST OF PRACTICALS

(12 experiments compulsory)

1. Young's modulus- Uniform bending- Microscope
2. Young's modulus - Non-uniform bending- Telescope
3. Rigidity modulus- Torsion pendulum
4. Viscosity of highly viscous liquid- Stokes' method
5. Viscosity- Variable pressure head- graduated burette method
6. Lee's Disc- K of Cardboard
7. Potentiometer- Calibration of voltmeter(low range)
8. Potentiometer- Calibration of ammeter
9. Series resonance circuit
10. Basic logic gates- OR, AND& NOT(using descrete components)
11. Zener diode charecteristics
12. Melde's string –frequncy of a tuning fork.
13. Spectrometer-refractive index of solid prism
14. Spectrometer- grating- normal incidence method
15. Air wedge- Thickness of wire

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics/Semester-IV/Ppr.no.31(A)/ Skilled Based – II (A)

MAINTANANCE OF LECTRONIC EQUIPMENTS

UNIT-I : Electronic components

Study of Electronic components - Resistors - types - characteristics - colour coding – wattage rating-potential divider arrangement-capacitors - type - characteristics -–working voltage-star and delta connection of resistors and capacitors - Soldering and desoldering techniques-Groove board,bread board and printed circuit board

UNIT-II :Measuring Instruments

Practical use of Multimeter (analog and digital) - CRO - Block Diagram -measurement of voltage, frequency and phase - waveforms and Lissajoue's figures. Digital Storage Oscilloscopes-LCD display for instruments -A/F and R/F oscillators.

UNIT-III :Transducers

Classification of transducers, Basic requirement/characteristics of transducers, Active andPassive transducers, Resistive (Potentiometer -Theory, temperature compensation &applications), Capacitive (variable air gap type), Inductive (LVDT) &piezoelectric transducers. Measurement of temperature (RTD, semiconductor IC sensors), Light transducers (photo resistors &photovoltaic cells).

UNIT-IV:Communication Devices

Basic concepts of radio transmitter and receiver - TV antennas: Resonance antennas and their characteristics - Dipole antenna - Folded dipole - Yagi antenna - Yagi antenna design - Dish antenna - DTH system - Mobile communication system - MODEM.

Telephone systems-cellular Telephone systems-mobile phone-principle of operation-integrated services=digital networks(ISDN)

UNIT-V: Photography

Introduction to cameras-parts of camera and accessories—lens shutter-aperture-flash photography-filters-battery-tele and wide angle lens

Digital formats-data transfer to computer-ISO speed-resolution

Books for Study and Reference

1. Principles of Electronics by V K Mehta, S Chand & Co., 5th edition 2001.

2. Functional Electronics by Ramanan.

3. Elements of Electronics by Bagde and Singh

4. Basic Electronics, 6th edition by B Grob, McGraw Hill NY 1

5. Electronic principles-Malvino 6 th edition

6.Basic electronics-B.Basavaraj,H.N.Shivasankar-Universities press

MSU/2016-17/UG-Colleges/Part-III (B.Sc. Physics)/Semester-IV/Ppr.no.31(B)/ Skilled Based - II (B)

PHYSICS OF HUMAN ANATOMY

Unit – 1:Physics light and its medical application to Human body

Properties of light – Measurement of Light – Energy of light – medical Application of Visible light, UV, IR and Laser in Human body.

Unit – 2:Physics of Breathing:

Pressure – Typical pressure in Normal body – Gas transport in respiratory system – Definition of pressure-Volume in Lung-Thorax system – Resistance of air passage – Timing of breathing process – Work required for Breathing

Unit – 3:Energy of Human body

Heat loss of the body due to conduction, convection, evaporation, radition- Wind chill – Mechanism to decrese body temperature – Medical implcation of high temperature.

Unit – 4:The Acoustics of Body

Sound – unit – wave equation – Unit of sound intensities for audotory system – production of speech – Physics of ear – outer Ear – inner Ear – Ear drum – Middle Ear

Unit – 5:Physics of Eye

Optical system of the body structure of Eye – Refraction focussing of the eye system – Geomentrical optics of the Eye – Structure of receptor system – Diffraction effects of Eye – Eye defects.

References:

1. web.**khu**.ac.kr/~bil/lecture/MedicalPhysics/**Ch14**.PDF
2. http://www.edb.utexas.edu/petrosino/Legacy_Cycle/mf_jm/Challenge2/physicsbreathing.pdf
3. http://web.khu.ac.kr/~bil/lecture/MedicalPhysics/Ch8.PDF

4. https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%203.%20Pressure%20System%20of%20the%20Body/Chapter%203.%20Pressure%20System%20of%20the%20Body.pdf
5. https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%204.%20Acoustics%20of%20the%20Body/Chapter%204.%20Acoustics%20of%20the%20Body.pdf
6. https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%205.%20Optical%20System%20of%20the%20Body/Chapter%205.%20Optical%20System%20of%20the%20Body.pdf
7. https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics/Part%20I.%20Physics%20of%20the%20Body/Chapter%202.%20Energy%20Household%20of%20the%20Body/2.3%20Heat%20losses%20of%20the%20body/Heat%20losses%20of%20the%20body.pdf
8. https://www3.nd.edu/~nsl/Lectures/mphysics/Medical%20Physics

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-IV/ Ppr.no.32 (A) /Non Major Elective – II (A)

BASICPHYSICS - II

UNIT I: Nuclear Physics

Introduction-nuclear structure-properties of nucleus-packing fraction-binding energy-nuclear forces- Radio activity-properties of alpha,beta and gamma rays-radio carbon dating-nuclear fission-nuclear fusion

UNIT II: Magnetic Materials

Classification Of Magnetic Materials-para-dia and ferromagnetic materials-crystalline and amorphous materials-conductors-insulators-superconductors

UNIT III Laser

Introduction-absorption-spontaneous emission-stimulated emission-population inversion-a general laser system-He-Ne laser-applications

UNIT IV Relativity

Introduction -reference frames-postulates of the special theory of relativity-length contrction-time dilation(no derivation)

Quantum mechanics-dual nature of wave and radiation-de-broglie waves-

UNIT V

Number systems in digital electronics-binary ,decimal and hexadecimal numbers – interconversions- binary addition and subtraction—binary coded decimal-logic gates

Books for study and Reference

1. Modern Physics- R.Murugesan, S. chand & Co
2. Electricity and Magnetism -R. Murugesan (S.Chand &Co.)
3. Digital principles and applications - Albert Paul Malvino & Donald P.Leach
4. Mechanics and mathematical physics- R.Murugeshan-S Chand & Co. Pvt. Ltd., New Delhi

MSU/2016-17/UG-Colleges/Part-IV (B.Sc. Physics)/Semester-IV/Ppr.no.32(B)/ Non Major Elective – II (B)

SPACE PHYSICS

UNIT I : Universe

Planets - interior planets - exterior planets - crust, mantle and core of the earth - different - region of earth's atmosphere - rotation of the earth - magnetosphere - Van Allen belts - Aurora.

UNIT II : Comets, Meteors, Asteroids

Composition and structure of comets - periodic comets - salient features of asteroids, meteors and its use.

UNIT III : Sun

Structure of photosphere, chromosphere, corona - sunspots - solar flares - solar prominences - solar piages - satellites of planets - structure, phases and their features of moon.

UNIT IV : Stars

Constellations - binary stars - their origin and types star clusters –
globular clusters - types of variable stars - types of galaxies.

UNIT V: Origin of Universe

Big bang theory - pulsating theory - steady state theory - composition of universe expansion

Books for study and Reference

1. K.D. Abyankar, Astrophysics of the solar system, University press, India.
2. Baidyanath Basu, An introduction to Astrophysics, Prentice Hall of
India, New Delhi.
3. Prof. P. Devadas, The fascinating Astronomy, Published by Devadas
Telescopies, 2, Charkrapani Road, Guindy, Chennai.
4. Elements of Space Physics – R.P. Singhal, PHI.