

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

UG COURSES – AFFILIATED COLLEGES

**B.Sc. Electronics
(Choice Based Credit System)**

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

(45th SCAA meeting held on 09.02.2017)

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	III	15	Core – 3	ELECTRONIC CIRCUITS	6	4	25	75	100	30	40
		16	Core – 4	ELECTRONIC MEASUREMENTS AND CIRCUIT THEORY	6	4	25	75	100	30	40
		17	Major Practical – III	CIRCUITS AND MEASUREMENTS LAB	6	4	50	50	100	20	40
		18	Allied III (Allied Electronics for other major students)	ELECTRONIC DEVICES	4	2	25	75	100	30	40
		19	Allied Practical – III (Allied Practical for other major students)	ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB	2	2	50	50	100	20	40
IV	20	Skilled Based subject –I	CONSUMER ELECTRONIC APPLIANCES	4	4	25	75	100	30	40	
IV	21	Non-Major Elective - I	(A)ELECTRONIC TROUBLE SHOOTING (OR) (B)COMPUTER HARDWARE	2	2	25	75	100	30	40	
SUB- TOTAL					30	22					

Sem.	Pt I/II/ III/ IV/V	Su b No.	Subject status	Subject Title	Hrs/ week	Cre dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext.	Tot.
IV	III	22	Core - 5	LINEAR INTEGRATED CIRCUITS	6	4	25	75	100	30	40
		23	Major Practical - IV	LINEAR INTEGRATED CIRCUITS AND ELECTRONIC CIRCUITS LAB	6	4	50	50	100	20	40
		24	Major Elective-I (Select any one)	(A)COMPUTER NETWORKS (OR) (b) ELECTRICAL MACHINES	6	5	25	75	100	30	40
		25	Allied – IV (Allied Electronics for other major students)	DIGITAL CIRCUITS	4	4	25	75	100	30	40
		26	Practical – IV (Allied Practical for other major students)	ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB	2	2	50	50	100	20	40
	IV	27	Skilled Based subject - II	MAINTENANCE AND TROUBLESHOOTIN G OF AUDIO AND VIDEO EQUIPMENT	4	4	25	75	100	30	40
	IV	28	Non Major Elective-II (Select any one)	(A) RADIO AND TELEVISION (OR) (B)RADAR AND NAVIGATION	6	2	25	75	100	30	40
	V		Extension Activity	NCC,NSS, YRC, YWF		1					
SUB- TOTAL					30	26					

**MSU/2016-17/UG-Colleges/Part-III /(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.15/Core-3**

ELECTRONIC CIRCUITS

UNIT I

Rectifiers- half wave rectifier, full wave rectifier, bridge rectifier, Inductor- Capacitor-L type filters-ripple factor-Voltage regulator(series type)-current limit over load production-introduction to IC fixed and variable IC 723,78XX,79XX-voltage regulators-formula value substitution problems.

UNIT II

Amplifiers-general principle of operation-classification of amplifiers-classification of distortion (amplitudes, frequency, phase)-RC coupled amplifier-gain-frequency response-input and output impedance -multistage amplifiers-transformer couple amplifiers-frequency response-formula value substitution problems.

UNIT III

Introduction-classification power amplifier-class A power amplifier-class A push pull amplifier-class B power amplifier- class B push pull amplifier- class C power amplifier- class C push pull amplifier-power dissipation output power-distortion-formula value substitution problems.

UNIT IV

Feed back-basic concepts-characteristics-effect of negative feedback- on gain- stability-distortion-band width- analysis of voltage and current feedback amplifier circuits- formula value substitution problems.

UNIT V

Classification of oscillators-use of positive feedback – barkhausen criterion for oscillation-colpitts oscillator-Hartley oscillator-wein bridge oscillator- phase shift oscillator- crystal oscillator-frequency stability of oscillators-multivibrators (mono, astable, bistable)- formula value substitution problems.

BOOKS FOR REFERENCE:

1. Electronic devices and circuits-Millman & Halkias.
2. Electronic devices and applications and Integrated circuits-Mathu.
3. Basic Electronics-B.L.Theraja.
4. Electronic devices and circuits- G.K.Mithal,Khanna publishers.
5. Electronic devices and circuits – Allen mottershead.
6. Problems and solutions of electronic devices and circuits-Experience teachers (CBS publication, New Delhi).

**MSU/2016-17/UG-Colleges/Part-III /(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.16/Core-4**

ELECTRONIC MEASUREMENTS AND CIRCUIT THEORY

UNIT I

Measurements, errors in measurements- measurement standard, Classification and characteristics of Transducers, AC/DC Bridge measurements and their applications.

UNIT II

PMMC – DC ammeter – DC voltmeter - Voltmeter sensitivity - Ohm meter – VOM or Multimeter – Calibration Digital Voltmeters and Multimeters, AC Voltmeter-Vector Voltmeter- CRO- Block Diagram – single beam – dual trace – Sampling Oscilloscope,

UNIT III

Ohms Law-power Energy-resistors in series,parallel- Kirchoff's Laws and their applications – Branch and loop currents- mesh and node analysis.

UNIT IV

Fundamental ideas of AC circuits - impedance of RL, RC, RLC circuits-Resonance in AC circuits-series and parallel.

UNIT V

Network graph of a network- concept of tree- branches and chords dual networks- Network theorems: Superposition, Thevenin, Norton, Maximum Power transfer Theorem

BOOKS FOR REFERENCE:

1. C.S.Rangan "Instrumentation Devices and Systems" Tata McGraw Hill, 1998.
2. Copper "Electronic Instrumentation and Measurement Techniques" PHI
3. A.J. Bouwels "Digital Instrumentation", McGraw Hill, 1986
4. C.Barney "Intelligent Instrumentation" Prentice Hall of India, 1985
5. Oliver and Cage "Electronic Measurements and Instrumentation" McGraw HILL,1975
6. Deobelin "Measurements Systems" McGraw HILL, 1990
7. Electronic circuits – Edminister (Schaum outline series – TMH)
8. Circuits and networks, Analysis and synthesis – A.Sudakar & S.P. Shyammohan (TMH).
9. Networks, analysis and synthesis – Umesh sinha.
10. Electronic circuits Theory – Dr.M.Arumugam & Dr.N.Prem Kumaran (Khanna Publishers)

**MSU/2016-17/UG-Colleges/Part-III/ (B.SC.ELECTRONICS)/
Semester-III/Ppr.no.17/ Major Practical – III**

CIRCUITS AND MEASUREMENTS LAB

All experiments have to be carried out compulsorily from A and B

A. Circuits Lab

1. To familiarize with basic electronic components (R, C, L, diodes, transistors), digital Multimeter, Function Generator and Oscilloscope.
2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
3. Verification of Kirchoff's laws.
4. Verification of Thevenin's theorem
5. Verification of Norton's theorem.
6. Verification of Superposition Theorem.
7. Verification of Reciprocity Theorem.
8. Verification of Maximum Power Transfer Theorem.
9. Transient Response
10. Series resonance.
11. Parallel Resonance

B. Measurements Lab

1. Wheatstone bridge
2. Kelvin double bridge
3. Maxwell bridge
4. Hay bridge
5. Schering bridge
6. LVDT
7. Displacement meter
8. Transducer Applications and Measurement
9. Extension of range of PMMC meter
10. Current Measurement using sensors

* Students should be encouraged to do a mini project which should be submitted at the end of the IV semester

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.18/Allied- III**

ELECTRONIC DEVICES

UNIT I

Basic components used in Electronics -Resistor, capacitor, inductor and their different types - Diodes - Light Emitting diode (LED), Photo diode - Zener diode, LDR .

UNIT II

Power Supplies -Need of a power supply - Types of power supplies - Different types of unregulated and regulated power supplies - IC Regulated power supply - switched mode power supply.

UNIT III

Amplifiers- Transistor as an amplifier - Types of Amplifiers - Single stage amplifier - Amplifiers with feedback - Negative feed back amplifiers.

UNIT IV

Oscillators & Switching circuits - Transistor as an oscillator - Barhausen criteria - Hartley and colpitt's oscillators - Crystal oscillators

UNIT V

Electrical elements-Potential difference- Electric current-Electromotive force-Ohms law- Kirchoff's law- Kirchoff's current law- resistance in series circuits, parallel circuits and Concept of voltage source and current source

TEXT BOOK:

1. Principles of Electronics - V.K. Mehta - S.Chand Publication, New Delhi
2. Electronic devices and circuits - G.J.Mithal, Khana publishers, New Delhi
3. Modern Physics - R.Murugesan - S.Chand publication, New Delhi
4. Basic Electronics - B.L. Theraja - S.Chand publication, New Delhi

BOOK FOR REFERENCE:

1. Electronic devices and circuits - B.Sasikala, S.Poornachandra Scitech publication India Pvt. Ltd., Chennai.
2. Electronic devices and Application and integrated circuits - Mathur kulashethra & Chandra Umesh publication, New Delhi.
3. Hand book of Electronics - Gupta & Kumar, Pragathi prakashan, Delhi.

**MSU/2016-17/UG-Colleges/Part-III/ (B.SC.ELECTRONICS)/
Semester-III/Ppr.no.19/ Allied Practical - III**

ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB

PART – A

1. Characteristics of PN diode
2. Characteristics of Zener diode
3. Transistor Characteristics – Common base
4. Transistor Characteristics – Common emitter
5. Transistor Characteristics – Common collector
6. Measurement of stability factor of self biasing method
7. Measurement of stability factor of fixed biasing method
8. FET Characteristics
9. Photoconductivity of LDR
10. Characteristics of Photo diode
11. Characteristics of SCR
12. Characteristics of Photo transistor

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.20/ Skill Based Subject – I**

CONSUMER ELECTRONIC APPLIANCES

UNIT I

MICROWAVE OVENS

Microwaves - Properties and generation - Microwave oven block diagram - LCD timer with alarm - Controllers - Wiring and Safety instructions - Care and Cleaning.

UNIT II

WASHING MACHINES

Electronic controller for washing machines - Washing machine hardware and software - Types of washing machines - Fuzzy logic washing machines - Features of washing machines.

UNIT III

AIR CONDITIONERS AND REFRIGERATORS

Air Conditioning - Components of air conditioning systems - All water air conditioning systems - All air conditioning systems - Unitary and central air conditioning systems - Split air conditioners.

UNIT IV

HOME / OFFICE DIGITAL DEVICES

Facsimile machine - Xerographic copier - Calculators - Structure of a calculator - Internal Organization of a calculators - Servicing electronic calculators - Digital clocks - Block diagram of a digital clock.

UNIT V

DIGITAL ACCESS DEVICES

Digital computer - Internet access - Online ticket reservation - Functions and networks - Barcode Scanner and decoder - Electronic Fund Transfer - Automated Teller Machines (ATMs) - Set-Top boxes - Digital cable TV - Video on demand.

TEXT BOOK:

1. Consumer Electronic - S.P. Bali, Pearson Education, New Delhi, 2005.

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.21 (A)/ Non- Major Elective – I (A)**

ELECTRONIC TROUBLESHOOTING

UNIT I

Corrective maintenance-Troubleshooting-Repairing troubles-Testing or operational check-Troubleshooting aids-corrective maintenance time-intermittent troubles-Precautions while trouble shooting and repair

UNIT II

Preventive maintenance-Merits and demerits of preventive maintenance-Preventive maintenance program- Maintenance schedule-Maintenance record-shut down planning-calibration - inspection

UNIT III

Classification of printed circuit boards-Manufacturing process-Repair of PCB's

UNIT IV

Digital test instruments-Basic digital Measurements-Testing digital circuits-Digital equipment service literature-Digital trouble shooting—use of some test equipments

UNIT V

Troubleshooting laboratory and Industrial equipments—Power supplies , oscillators, function generators-Speed controllers-C.R.O

TEXT BOOK

Maintenance of Electronic Equipments-K.S Jamwal- Dhanpat Rai &Co

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-III/Ppr.no.21(B)/ Non- Major Elective – I (B)**

COMPUTER HARDWARE

UNIT I

CPU essentials – processor modes – modern CPU concepts – Architectural performance features – the Intel's CPU

UNIT II

Essential memory concepts – memory organizations – memory packages –modules – logical memory organizations – memory considerations – memory types – memory techniques – selecting and installing memory.

UNIT III

Active motherboards – sockets and slots – Intel D850GB – Pentium4 mother board – expansion slots – form factor – upgrading a mother board – chipsets –north bridge – south bridge

UNIT IV

Power supplies and power management – concepts of switching regulation – potential Power problems – power management. The floppy drive – magnetic storage – magnetic recording principles – data and disk organization – floppy drive – hard drive – data organization and hard drive – sector layout

UNIT V

IDE drive standard and features – Hard drive electronics – CDROM drive – construction – CDROM electronics – DVD-ROM – DVD media – DVD drive and decoder.

TEXT BOOK:

1. Stephen J.Bigelow, "Trouble Shooting, maintaining and Repairing PCs", Tata McGraw-Hill, New Delhi, 2001.

BOOK FOR REFERENCE:

1. Craig Zacker & John Rourke, "The complete reference: PC hardware", Tata McGraw-Hill, New Delhi, 2001.
2. Mike Meyers, "Introduction to PC Hardware and Trouble shooting", Tata McGraw-Hill, New Delhi, 2003.
3. B.Govindarajulu, "IBM PC and Clones hardware trouble shooting and Maintenance", Tata McGraw-Hill, New Delhi, 2002.

LINEAR INTEGRATED CIRCUITS

UNIT I

Differential amplifiers-dual input-balance output differential amplifier- current mirror- level translator- block diagram representation of typical op amp- interpreting a typical set of data sheets- the ideal opamp- equivalent circuit of an op amp- ideal voltage transfer curve.

UNIT II

Input offset voltage – input bias current- input offset current- total output offset voltage- input and output resistance-thermal drift-CMRR-voltage shunt and voltage series feedback amplifiers.

UNIT III

Frequency response of initially compensated op amp- circuit stability-slew rate. Filters: low pass filters- high pass filters- band pass filters-band reject filters-all pass filters.

UNIT IV

Adder-subtractor-Integrator-differentiator – V to I and I to V converter.

Oscillator: Principles-types-frequency stability phase shift oscillator-wein bridge oscillator- square wave generator –triangular wave generator.

UNIT V

Comparator-Schmitt trigger-clipper and clamper-peak detector-zero crossing detectors- IC-555 function block diagram-mono stable operation –astable operation –applications

BOOKS FOR REFERENCE

1. Linear Integrated Circuits- D.Roychoudry & Shail Jain (New age publications 1999).
2. Operational amplifiers and linear integrated circuits-F.Couglin & Drison (4th edition prentice hall of India, 1992).
3. Operational amplifiers and linear integrated circuits- Denton J.Dailey, McGraw Hill 1989.
4. Operational amplifiers and linear integrated circuits-Ramakant A.Gayakwad 3rd edition PHI.
5. Second Edn. Operational amplifiers and Linear Ics-David A. Bell.

**MSU/2016-17/UG-Colleges/Part-III (B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.23/ Core Practical –IV**

LINEAR INTEGRATED CIRCUITS AND ELECTRONIC CIRCUITS LAB

All experiments have to be carried out compulsorily from A and B

A. Linear Integrated Circuits Lab

1. Inverting and Non Inverting Amplifier.
2. Integrator and Differentiator.
3. Instrumentation Amplifier.
4. High pass, Low pass and Band pass filters.
5. Astable and Monostable multivibrator using OP-AMP.
6. Phase shift and Wien Bridge oscillator using OP-AMP.
7. Digital to Analog Converter, Analog to Digital Converter.
8. Astable Multivibrator and Monostable Multivibrator using IC555.
9. Schmitt Trigger and Comparator using OP-AMP.
10. Design of light switch using LDR and Relay.

B. Electronic Circuits Lab

1. Half wave rectifier and Full wave rectifier
2. Construction of power supply using C filter and zener diode as regulator.
3. Characteristics of Class A Power Amplifier
4. Characteristics of Class B Power Amplifier
5. Design a Single Stage CE amplifier.
6. Design of Two stage RC coupled Amplifier
7. Clipping and Clamping circuits
8. Hartley Oscillator
9. Colpitt's Oscillator.
10. Astable Multivibrator using BJT.

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.24(A)/ Major Elective – I (A)**

COMPUTER NETWORKS

UNIT I

Data Communication Concepts: Transmission media – Data encoding – Interface and Modems – Multiplexing – Error detection and correction – Digital subscriber line – Circuit switching – Packet switching – Message switching.

UNIT II

Wide Area Networks: ISO – OSI layered architecture – Function of the layers – Data link protocols – HDLC, LAPB, LAPD, Inter networking devices – Repeaters, Bridges, Routers, Routing algorithms – Distance vector routing, link state routing, X.25 protocol, congestion control.

UNIT III

Frame relay and ATM networks: Frame relay operation – layers and traffic control; ATM networks – Architecture switching, layers service classes.

UNIT IV

Local Area Network: LAN topology – Ethernet – Token bus – Token ring – FDDI – Wireless LAN, ATM LAN – IEEE 802 Medium access control layer standard – Random access protocols – ALOHA – Slotted ALOHA.

UNIT V

OSI Layers: Transport layer issues – Session layer – Synchronization – Presentation layer – Encryption, decryption, Application layer – Message handling system, file transfer, virtual terminal – E-mail.

TEXT BOOK

1. William Stallings, "Data and Computer Communication", sixth edition, Pearson education Asia, 2000.

REFERENCES

1. Behrouz A, Forouzan, "Data Communication and Networking", second edition, Tata McGraw-Hill, 2000.
2. Fred Halsall, "Data Communication, Computer networks and Open Systems", Fourth edition, Addison Wesley, 1995.
3. Andrew S.Tanenbaum, "Computer networks", Third edition, PHI, 1996,

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.24(B) Major Elective – I (B)**

ELECTRICAL MACHINES

UNIT I

D.C Motors: Motor Principle-Comparison of motor and generator action- characteristics of shunt, series and compound wound motors -starting – 3-point and 4-point starters – Calculation of resistance elements for shunt motor starters – methods of speed control of shunt, series and compound wound motors – Electric braking –Electronic speed control.

UNIT II

DC Generator-Working principle –Parts of DC Generator–Types of armature windings-EMF equation of generator-Characteristics of dc generator-classification of DC generator-self excitation – Armature reaction- remedies-commutation-Methods of removing commutation-losses in DC generators-Efficiency of DC generator-Rating of a generator

UNIT III

Transformers-Working principle of transformers-Transformer construction-Core type transformer-shell type transformer-voltage transformation ratio-losses-Efficiency- Rating-Construction and use of autotransformer-parallel operation of transformer

UNIT IV

Alternator-Working principle-Parts-types-relation between Speed-Poles-Frequency-coil span and distribution factor-Equation of Alternator-Rating-losses-Synchronization-Parallel operation of alternators

UNIT V

Single phase motors-Induction motor-Shaded pole-Split phase-Capacitor motor-Capacitor start-Capacitor start capacitor run-Universal motor or AC series motor-Repulsion motor-synchronous motors-applications 3 ϕ Induction motor- Squirrel cage motor-Slipring induction motor-Double squirrel cage induction motor-Starting of induction motor-Star delta starter-Determining phase sequence-Speed control-Magnetic locking-Losses.

TEXT BOOK

Electrical Technology-B.L Theraja A.K Theraja

REFERENCE

Basic electrical Engg -P.S Dhogal TMH

**MSU/2016-17/UG-Colleges/Part-III/(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.25/ Allied- IV**

DIGITAL CIRCUITS

UNIT I

Basics and Number systems-Digital signals – Basic Digital circuits – NAND, NOR, EX-OR – Universality of NAND and NOR – Number systems – Conversions.

UNIT II

Combinational Logic Design-Boolean Algebra – Demorgan's Theorem – Karnaugh Map – Don't care condition – Multiplexer – Demultiplexer.

UNIT III

Flipflops-Rs flipflop – JKFF – D FF – T FF – Master slave FF – Applications

UNIT IV

Shift Registers and counters-Registers – Left shift, Right shift, Parallel in parallel out Counters – Ripple counter, Decade counter – Modulo counters.

UNIT V

Memories-RAM – static, Dynamic – Diode ROM – PROM – EPROM – E2 PROM

TEXT BOOK

1. Modern Digital electronics : R.P. Jain, TataMcGraw Hill 1997
2. Digital Electronics, V.K. Puri, Tata Mc Graw Hill
3. Computer System Aaraachitecture, 2nd Edition, M. Marris mano, Prentice Hall, 1998

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.26/ Allied Practical – IV
ELECTRONIC DEVICES AND DIGITAL CIRCUITS LAB**

PART – A (Carried out in third semester)

1. Characteristics of PN diode
2. Characteristics of Zener diode
3. Transistor Characteristics – Common base
4. Transistor Characteristics – Common emitter
5. Transistor Characteristics – Common collector
6. Measurement of stability factor of self biasing method
7. Measurement of stability factor of fixed biasing method
8. FET Characteristics
9. Photoconductivity of LDR
10. Characteristics of Photo diode
11. Characteristics of SCR
12. Characteristics of Photo transistor

PART – B (To be carried out in fourth semester)

1. Study of AND, OR, NOT, NAND, NOR and XOR gates using IC
2. Designing of all the logic gates using NAND gate IC
3. Designing of all the logic gates using NOR gate IC
4. Verification of Demorgan's theorems
5. Construction of gates using discrete components
6. Code conversion
7. Half adder and Full adder
8. Half subtractor and Full subtractor
9. Multiplexer and De-Multiplexer
10. Encoder and Decoder
11. Study of Flip flops
12. Shift register
13. Ripple counter

**MSU/2016-17/UG-Colleges/Part-III(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.27/ Skilled Based Subject – II**

**MAINTENANCE AND TROUBLE SHOOTING OF AUDIO
AND VIDEO EQUIPMENTS**

UNIT I

Recording and reproduction principles - Optical recording - Different types - Methods of recording and reproduction - Optical recording on compact disc - play back process - Advantage of compact disc - Trouble shooting in compact disc.

UNIT II

Stereophony - Stereophonic recording on disc and reproduction - Hi-Fi Stereo reproducing system - Block diagram of Public Addressing system - Requirement of Public Addressing system - Typical PA installation planning for a public meeting - PA system for an auditorium troubleshooting in PA system.

UNIT III

Monochrome, PAL colour TV transmitters Faults in TV transmitter - Testing of TV transmissions monochrome TV receiver - Fault in monochrome TV receiver - PAL colour TV receiver - Faults in colour TV receiver - Testing of TV receiver.

UNIT IV

Video disc format - Video recording on disk - Very High density disk - High definition TV system - Block diagram of MAC encoder - MAC receiver - Advantages.

UNIT V

Digital TV system - Cable TV concepts set top box - Dish TV and connections - Closed circuit television - Introduction to FLAT LCD and Plasma television systems.

TEXTBOOKS

1. Electronic Instruments and systems, Principles, Maintenance and Troubleshooting - R.G. Gupta Tata Mc Graw Hill Publishing Co.Ltd.
2. Colour Television Theory and Practice - S.P. Bali, Tata Mc Graw Hill Publishing Co.Ltd.

REFERENCE BOOKS

1. Audio and Video systems - R.G. Gupta Tata Mc Graw Hill Publishing Co.Ltd.
2. Monochrome and Colour Television - R. Gulati. New Age Interbational (P) Ltd. New Delhi.

**MSU/2016-17/UG-Colleges/Part-IV/(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.28(A) /Non-Major Elective - II (A)**

RADIO AND TELEVISION

UNIT I

Radio Communications- Radio waves – Frequency & Wavelength – Modulation – Propagation of radio waves – Ground, Sky and Space waves – Fading – Radio Broadcast – Transmission and Reception.

UNIT II

Radio Transmission-Classification of radio waves – Amplitude modulation – Frequency modulation – Radio transmitter – AM transmitter – Antennas (transmitting antenna), Basic ideas.

UNIT III

Radio Reception- Reception and detection of amplitude modulated waves – Function of a radio receiver – Characteristics of a receiver – Super heterodyne receiver – FM Broadcast receiver.

Unit IV

TV Transmission-TV broadcasting system – scanning – Synchronization – Blanking – Video Signal – Television band and channels – Camera tubes – Image orthicon Vision.

UNIT V

TV Reception-TV receiver – Tuner – Picture section – Receiver sweep section – Sound section power supply section – Color Mixing principles in color TV.

TEXT BOOKS

1. Basic Television and Video Systems, B.Grob, McGraw Hill
2. Electronics and Radio Engineering, F.E. Terman, McGraw Hill

REFERENCE BOOK

- 1.Monochrome and Color Television, R.R. Gulari, Wiley Eastern Ltd.,

**MSU/2016-17/UG-Colleges/Part-IV/(B.SC.ELECTRONICS)/
Semester-IV/Ppr.no.28 (B) /Non Major Elective - II (B)**

RADAR AND NAVIGATION

UNIT I

An Introduction to Radar: Basic Radar, The simple form of the Radar Equation Block schematic of pulse radar- Radar frequencies- Applications of radar, the origins of Radar

UNIT-II

CW radar- applications of CW radar- CW radar with nonzero IF- FM CW radar-FM CW altimeter-MTI and Pulse Doppler radar.

UNIT-III

Introduction to Doppler and MTI Radar, delay line Cancellers, digital MTI processing, Moving target detector, pulse Doppler Radar

UNIT IV

Direction finders- Instrument Landing System- Radio ranges. Navigation- Hyperbolic navigation-LORAN. Satellite navigation- Doppler navigation

UNIT-V

Global positioning system- Different types of microwave antennas-basic principles. Microwave passive devices, Coaxial connectors and adapters, Phase shifters, Attenuators, Waveguide Tees, Magic tees,

TEXT BOOKS

1. Microwave Devices and circuits- Liao / Pearson Education
2. Introduction to Radar systems-Merrill I Skolnik, 3rd Ed, TMH, 2001.
3. Microwave Engineering – Annapurna Das, Sisir K Das TMH Publication, 2001

REFERENCE BOOK

1. Microwave Engineering – David M Pozar, John Wiley, 2e, 2004
2. Microwave devices and circuit: Samuel Liao, PHI.
3. Microwave and radar — A K Maini, Khanna Publishers.
4. Microwave and Radar Engg. — M Kulkarni.
5. Introduction to radar systems — Merrill I Skolnik, McGraw Hill.
6. Radar systems and radio aids to navigation — A K Sen & A B Bhattacharya.