S.N.R. SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :** Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
7	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X:** **SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Telecommunication system
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment **Total Marks for the Programme : 3600**
CE: Comprehensive Examination **Total Credits for the Programme: 140**

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SEMESTER I:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T01/ H01/ F01/M01	**Part I :** **Language:** Tamil – I /Hindi – I / French – I / Malayalam – I	3	3	25	75	100
2	15E01	**Part II:** English for Communication – I	3	3	25	75	100
3	15EC101	**Part III:** Electric Components	4	3	25	75	100
4	15EC102	Electric Circuits	4	3	25	75	100
5	15EC103	**Allied I:** Mathematics – I	4	3	25	75	100
6	15EC104	**Practical I:** Components and Network Analysis	3	3	40	60	100
7	15ES01	**Part IV:** Environmental Studies	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER II:

S.No	Course Code	Course	Number of Credits	Exam Hours	CIA	CE	Total
I	15T02/H02/ F02/M02	**Part I:** **Language:** Tamil – 2 / Hindi – 2 / French – 2 / Malayalam – 2	3	3	25	75	100
2	15E02	**Part II:** English for Communication – II	3	3	25	75	100
3	15EC201	**Part III:** Electronic Devices	4	3	25	75	100
4		**SUPPORTIVE COURSE– I**	4	3	25	75	100
5	15EC202	**Allied II :** Mathematics – II	4	3	25	75	100
6	15EC203	**Practical II :**Electronic Devices	3	3	40	60	100
7	15VE01	**Part IV:** Value Education	2	2	50	--	50*
		TOTAL	**23**				**600**

SEMESTER III:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC301	**Part III:** Digital Electronics and Applications	4	3	25	75	100
2	15EC302	**ELECTIVE I**	4	3	25	75	100
3	15EC303	**Allied III:** Computer Programming I [C++Programming]	4	3	10	40	50
4	15EC304	**Practical III:** Digital Electronics	3	3	40	60	100
5	15EC305	**Practical IV:** Electronic Principles and Circuits	3	3	40	60	100
6	15EC306	**Allied Practical I:** Computer Lab- I C++ Programming	2	3	20	30	50
7	15EC307	**Skill Based Course – I:** Electronic Principles and Circuits	3	3	25	75	100
8	15BT01	**Part IV:** Basic Tamil I	2	3	75	--	75*
9	15AT01	Advanced Tamil I		3	--	75	
10	15NM01	Non Major II – Personality development		3	--	75	
		TOTAL	**25**				**600**

SEMESTER IV:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I		**Part III: SUPPORTIVE COURSE – II**	4	3	25	75	100
2	15EC401	**Allied IV:** Computer Programming II [Visual Basic Programming]	4	3	10	40	50
3	15EC402	**Practical V: SUPPORTIVE COURSE – II**	3	3	40	60	100
4	15EC403	**Practical VI:** Electronic Communication Lab	3	3	40	60	100
5	15EC404	**Allied Practical II :** Computer Lab II: Visual Basic Programming	2	3	20	30	50
6	15EC405	**Skill Based Course – II :** Electronic Communication - II	3	3	25	75	100
7	15BT02	**Part IV:** Basic Tamil II	2	3	75	--	75*
8	15AT02	Advanced Tamil II		3	--	75	
9	15NM02	Non Major II – General Awareness		3	--	75	
		TOTAL	**21**				**500**

SEMESTER V:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC501	**Part III:** Modern Communication System	5	3	25	75	100
2	15EC502	Industrial and Power Electronics	5	3	25	75	100
3	15EC503	**ELECTIVE II**	4	3	25	75	100
4	15EC504	**Practical VII:** Modern Communication Lab	3	3	40	60	100
5	15EC505	**Practical VIII:** Industrial and Power Electronics	3	3	40	60	100
6	15EC506	**Practical IX:** 8051 Microcontroller Lab	3	3	40	60	100
6	15EC507	**Skill Based Course – III :** 8051 Microcontroller	3	3	25	75	100
		TOTAL	**26**				**700**

SEMESTER VI:

S.No	Course Code	Course	Number of Credit	Exam Hours	CIA	CE	Total
I	15EC601	**Part III:** Wireless and Network Communication	5	3	25	75	100
2		**SUPPORTIVE COURSE – III**	4	3	25	75	100
3	15EC602	**Practical X: SUPPORTIVE COURSE – III**	3	3	40	60	100
4	15EC603	**Practical XI:** Sensor and Medical Electronics	3	3	40	60	100
5	15EC604	**Practical XII:** 8051 Interfacing Techniques Lab	3	3	40	60	100
6	15EC605	**Skill Based Course – IV:** Sensor and Medical Electronics	3	3	25	75	100
7	15EA01	**Part V:** Extension Activities	1	--	50	--	50*
		TOTAL	**22**				**600**

S.N.R.SONS COLLEGE (AUTONOMOUS)
DEPARTMENT OF ELECTRONICS
B.Sc., ELECTRONICS AND COMMUNICATION SYSTEM
(ACADEMIC YEAR 2015 – 2016 ONWARDS)
SCHEME OF EXAMINATION

SUPPORTIVE COURSE:

S.No	Supportive Course – I	Supportive Course – II	Supportive Course – III
1	Instruments and Measurements	ICs and their Applications	VLSI System Design and VHDL Programming
2	Opto Electronics and Devices	Digital Communication	Modern Communication System
3	Material Science	PC Hardware	Computer Communication Network

ELECTIVES:

S.No	Course Code	Elective – I	Course Code	Elective – II
1	15EC302	Electronic Communication - I	15EC503	Electronic Design and Automation
2	15EC302A	Optical Communication	15EC503A	Digital signal Processing
3	15EC302B	Web Technology	15EC503B	Antenna and Wave Propagation

*** Not Included in CGPA**

CIA: Continuous Internal Assessment
CE: Comprehensive Examination

Total Marks for the Programme: 3600
Total Credits for the Programme: 140

G. SENTHIL KUMAR
Chairman, Board of studies in Electronics
S.N.R. Sons College, Coimbatore

SEMESTER – I
ELECTRIC COMPONENTS
COURSE CODE: 15EC101

Instructional hours per week: 5

Objective: To make the students to learn about various components and to study the usage and applications of those components.

UNIT I: RESISTORS **[12 Hrs]**

Resistors Specifications - Classifications of Resistors:

Linear Resistors: Fixed Resistors (Carbon Composition, Thin Film, Thick Film, Wire Wound) - Variable Resistors (Wire Wound, Potentiometer, Trimmers)

Non Linear Resistors: Thermistors, Photo Resistors, Varistors , Resistance designation- Colour Coding of Resistors- Troubles in Resistors - Resistors in Series and parallel Combinations

UNIT II: INDUCTORS **[11 Hrs]**

Inductance – Inductors- Types of Inductors: Fixed Inductors: - Air Core Inductors Variable Inductors:- Variable Ferrite Core Inductor – Self Inductance of a coil – Mutual Inductance of Coil – Inductors in Series and Parallel with Mutual Inductance – Inductive Reactance – Energy Stored by an Inductor – Coil and Core Losses – Q Factor of Inductor – Factors Affecting Inductance of a Coil – Troubles in Coil.

UNIT III: CAPACITORS **[11 Hrs]**

Capacitance – Capacitors – Capacitor Specifications – Capacitor Action – Types of Capacitor: Fixed Capacitors: Electrolytic, Ceramic, Mica, Paper Variable Capacitors:- Gang Capacitors, Trimmer & Padders, Capacitors in Series and Parallel – Factors affecting the Capacitor – Capacitive Reactance – Troubles in Capacitors

UNIT IV: VOLTAGE AND CURRENT SOURCES **[11 Hrs]**

Batteries – Internal Resistance of a Sources – Concept of Voltage Source – Ideal Voltage source - Practical Voltage Source – VI Characteristics of Practical Voltage Source - Procedure for Determining Internal Resistance – Ideal Current Source - Practical Current Source - Equivalent Between Voltage Source and Current Source – Conversion of Voltage, Current Source

UNIT V: CIRCUIT CONTROL AND PROTECTIVE DEVICE **[10 Hrs]**

Switches – Switching Action – Types of Switches, (SPST, SPDT, DPST, DPDT, Toggle Switch, DIP, Rotary Switch) Fuses Rating, Connectors, Insulators, Circuit Breaker, Relays (Electromagnetic Relay)

TEXT BOOKS:

1. R.S.Sedha, "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 1983 (Unit IV)

REFERENCE BOOKS:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, I Metric Edition, 1987

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2004

SEMESTER – I
ELECTRIC CIRCUITS
COURSE CODE: 15EC102

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electric circuits and to analyze different types of circuit.

UNIT I: ELECTRICITY [12 Hrs]

Introduction – Electric field - potential and potential difference, Unit of potential difference – Electric current – Unit of Electric current – Difference between electric charge and current - Electron and conventional current flow - Electrical resistance - Temperature coefficient of electrical resistance

UNIT II: ELECTRICAL ELEMENTS [10 Hrs]

Introduction – ohms law – Kirchoff's current law – Kirchoff's Voltage law – Method of Branch current, Node voltage method, Method of Mesh current.

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – Parallel circuit – Series parallel circuit.

UNIT III: NETWORK THEOREMS [11 Hrs]

Thevenin's theorem – Norton's theorem – Conversion of Thevenin and Norton – Super position theorem – Millman's theorem – Star to Delta and Delta to Star conversion – Maximum power transfer theorem.

UNIT IV: AC CIRCUITS [12 Hrs]

AC Circuit with resistance alone – Circuit with XL alone – Circuit with XC alone – Series reactance and resistance – parallel reactance and resistance - Series parallel reactance and resistance – Real power – Series resonance circuit - parallel resonance circuit – Q-factor.

TEXT BOOKS:

1. R.S. Sedha , "A Text Book of Applied Electronics", S. Chand & Company Ltd, I Edition, 1990 (Unit I,II,III,IV & V)

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics", Tata McGraw Hill, 1st Metric Edition,1984

SEMESTER – I
PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS
COURSE CODE: 15EC104

Any 10 Experiments:

1. Measurement of Amplitude, Frequency and phase difference using CRO
2. Resistor in Series, Parallel and Series-parallel
3. Voltage sources in series, parallel and series – parallel
4. Voltage and Current divider
5. Verification of Ohm's law
6. Verification of Kirchoff's law
7. Verification of Thevenin's Theorem
8. Verification of Norton's Theorem
9. Superposition Theorem
10. Millman's Theorem
11. Verification of Star-Delta Conversion
12. Maximum power Transfer Theorems
13. Series resonance circuit
14. Parallel resonance circuit
15. Frequency response of R, L &C

PART IV

SEMESTER – I
ENVIRONMENTAL STUDIES
COURSE CODE: 15ES01

UNIT I:	The multidisciplinary nature of environmental studies	**[6 Hrs]**
UNIT II:	Ecosystems	**[7 Hrs]**
UNIT III:	Biodiversity and its conversion	**[2 Hrs]**
UNIT IV:	Environmental pollution	**[5 Hrs]**
UNIT V:	Social issues and the environment	**[2 Hrs]**

TEXT BOOK:

1. Environmental Studies for Undergraduate Courses – Bharathiar University (Unit I – V)

REFERENCE BOOKS:

1. Environmental Education – V. K. Nantha

2. A Text book of Environmental studies – Thangamani .A. and T.Shymama

SEMESTER – II
ELECTRONIC DEVICES
COURSE CODE: 15EC201

Instructional hours per week: 5

Objective: To enable the students to learn the function of various electronic components and to steady their characteristics.

UNIT I: SEMICONDUCTOR [13 Hrs]

Energy band structure: Valance and Conduction Band – Conduction in solids – Hole formation and its movement - Conductors – Insulators and Semiconductors
Types of Semiconductor: Intrinsic semiconductor – Extrinsic semiconductor – N type semiconductor – P type semiconductor – Majority and Minority charge carriers – Mobile charge carries and immobile Ions – Drift – Diffusion

UNIT II: PN JUNCTION CHARACTERISTICS [10 Hrs]

PN junction – Formation of depletion layer - Barrier voltage – Effect of temperature on barrier voltage – VI Characteristics of PN Junction Diode.
Applications: Clippers, Clampers

UNIT III: SPECIAL DIODES [10 Hrs]

Zener Diode – Zener diode as a voltage regulator – Backward diode – Varactor diode - Step recovery diode - Schottky diode - Tunnel diode – Gunn diode – IMPATT diode - PIN diode – LASER diode

UNIT IV: BIPOLAR JUNCTION TRANSISTOR [10 Hrs]

Construction – Transistor biasing – Operation of NPN Transistor – Operation of PNP transistor, Types of configuration: CB configuration, CE configuration, CC configuration, Current amplification factor and characteristics of CB, CE &CC – Relation among α, β & γ

UNIT V: FET & UJT [12 Hrs]

Types of FET – Construction of JFET – Operation – Characteristics of JFET –, Drain & Transfer Characteristics of JFET –JFET parameters - Comparison of JFET with BJT
MOSFET – Working and Characteristics of Depletion type & Enhancement type MOSFET
Construction of UJT – Characteristics of UJT- Relaxation Oscillator

TEXT BOOK:

1. R.S.Sedha, "A Text book of Applied Electronics" I Edition S.CHAND and Company Ltd.1990
2. S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "ssElectronic Devices and Circuits", Tata McGraw hill publishing company limited.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, II Edition
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

SEMESTER – II

Supportive Course – I: INSTRUMENTS AND MEASUREMENTS

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To make the students to learn about various instruments and measuring techniques.

UNIT - I: ELECTRONIC INSTRUMENTS [12 Hrs]

Amplified DC meter - AC voltmeter using rectifiers - True RMS responding voltmeter - Electronic Multimeter - Ramp type Digital voltmeter - Q meter

UNIT -II: TRANSFORMERS [11 Hrs]

Transformer principle- Construction and Working - Turns ratio – Voltage ratio – Current ratio – Emf equation – Losses and efficiency – Auto transformer- LVDT –RVDT.

UNIT -III: BRIDGE MEASUREMENT [11 Hrs]

Introduction - Wheat Stone bridge - Kelvin bridge - Guarded wheat stone bridge -AC bridges and their application - Maxwell bridge - Hay bridge - Schering bridge - Wein bridge - Unbalance condition

UNIT - IV: OSCILLOSCOPE [11 Hrs]

Block diagram – CRT – Electro static focusing system – Electrostatic deflection system – Delay Line – Horizontal deflection system – Vertical deflection system – CRT circuits.

UNIT - V: SPECIAL PURPOSE OSCILLOSCOPE [10 Hrs]

Principle of Secondary emission - Analog storage oscilloscope--Digital storage oscilloscope-Comparison of Analog and digital storage Oscilloscope.

TEXT BOOKS:

1. A.K.Sawhney, "Electrical & Electronic Measurement and Instrumentation" (Unit II &IV)
2. William David Cooper, "Modern Electronic Instrumentation and Measurement" 1997 (Unit I, III & V)

REFERENCE BOOKS:

1. R.G.Gupta, "Electronic Instruments & Systems Principles Maintenance & Trouble Shooting" – TATA McGraw Hill Publishing Company Pvt. Ltd 2005 .

SEMESTER – II

Supportive Course – I: OPTO ELECTRONICS AND DEVICES

COURSE CODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to learn about different optical instruments and displays.

UNIT I: ILLUMINATION **[10 Hrs]**

Introduction: photon – Various Terminologies: Solid angle - Candela – Luminous flux – Luminous intensity – Laws of illumination: Inverse square law - Lambert's cosine law – Utilization, Maintenance and Depression factors

UNIT II: OPTICAL INSTRUMENTS **[10 Hrs]**

Photometers: Introduction – Types: Visual photometers: Bunsen general – spot photometers – Guilds flickers photometers - Illumination photometers - Types: Photo emissive cells - Photo conductive cells - photo voltaic cells

UNIT III: PHOTO OPTICAL STANDARDS **[12 Hrs]**

Primary standards of luminous intensity – Calibration by primary standards – Substandard distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distribution of luminous intensity – Calculation of luminance due to luminous intensity with a distributed source – Measurement of luminous flux and luminous intensity - Gas filled photo tubes – Multiple photo tubes

UNIT IV: DISPLAY DEVICES **[10 Hrs]**

Electrical indicating instruments - Basic components of display devices – Digital display methods – Digital units – Segments displays – Dot matrix displays – LED's – LCD's – Nixie tube - segmented gas discharge displays – Display conversion circuits

UNIT V: FIBER OPTIC MEASUREMENTS **[13 Hrs]**

Introduction - Index of refraction – Total internal reflection – Numerical aperture and losses - Model distortion and dispersion – Light sources and detectors – Power measurements - stabilized light sources – Measurement of fiber system losses – Optical time domain reflector meter – Applications of time domain reflector meter

TEXT BOOKS:

1. Umesh Sinha, "Electrical Electronics Measurements and Instrumentation", Satya Prakashan Publications, 6th Edition, 1999 (Unit I – V)

REFERENCE BOOKS:

1. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, "Electronic Devices & Circuits" - Tata Mc Graw Hill

2. Gerd Keiser, "Optical Fiber Communication System" -Mc Graw Hill IInd edition 1983

SEMESTER –II
Supportive Course–I: MATERIAL SCIENCE
COURSECODE: 15CB

Instructional hours per week: 5

Objective: To enable the students to know about different semiconductor, magnetic and optical materials.

UNIT I: CONDUCTING MATERIALS [13 Hrs]

Classical free electron theory of metals – electrical conductivity expression – drawbacks classical theory, quantum theory, free electron theory of metals – it's importance – elective mass of electron – concept of hole – origin of band gap in solids (qualitative treatment only) conductors, copper and aluminum – High Resistivity alloys - Super conductors – properties and applications

UNIT II: SEMICONDUCTOR MATERIALS [10 Hrs]

Elemental and compound semiconductors and their properties – carrier concentration in N-type and P-type semiconductors – variation of carried concentration with temperature and its influence – Hall Effect – experimental arrangement – applications of Hall Effect

UNIT-III: MAGNETIC AND DIELECTRIC MATERIALS [13 Hrs]

Different types of magnetic material and their properties – Heisenberg and domain theory of ferromagnetism – Hysteresis – energy product of a magnetic material – ferrite and their applications – magnetic recording materials – tapes and discs – metallic glasses – active and passive dielectrics and their frequency and temperature dependence – internal field and deduction of clausius mosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS [10 Hrs]

Optical properties of metals, insulators and semiconductors – excitons, traps, colour centers and their importance – phosphorescence and fluorescence – different phosphors used in CRO screens – Liquid crystal as display materials – twisted pneumatic display – construction and working of LED – LED materials – thermography and its applications – photoconductivity and photo conducting materials

UNIT – V: MODERN ENGINEERING MATERIALS [9 Hrs]

Metallic glasses as transformer core materials – Nano phase material – shape memory alloys – advanced ceramic materials – polymers – non-linear materials and their applications

TEXT BOOK:

1. Arumugam.M, 'Material science', Anuradha Technical Book Publishers, 1997 (Unit I – V)

REFERENCE BOOKS:

1. Pillai S.O, "Solid state physics", New Age INC, 1998
2. Van Vlac.L, "Material science for engineers", Addison Wesley, 1995
3. Kingery.W.D.,Bowen H.K. and Unimann, D.R., "Introduction to Ceramics", John Wiley and sons. 2nd Edition1991

SEMESTER – II

PRACTICAL – II: ELECTRONIC DEVICES
COURSE CODE 15EC203

Any 10 Experiments:

1. Band gap energy of Germanium
2. Band gap energy of Silicon
3. Temperature coefficient of junction diode
4. Junction diode characteristics
5. Clipping and Clamping circuits
6. Zener diode characteristics
7. Zener Diode as a voltage regulator
8. Characteristics of Schokkty diode
9. CE characteristics
10. CB characteristics
11. Stability factor of a transistor
12. Emitter follower
13. Characteristics of UJT
14. Relaxation Oscillator
15. FET characteristics

SEMESTER – II
PART – IV: VALUE EDUCATION
COURSE CODE: 15VE01

UNIT –I **[5 Hrs]**

Value Education- Meaning and nature of values -Basic Characteristics of Values - Essential components of values - Classification of values - Sources of values - Value education - Concept & Meaning -Need of Value Education - Objectives of Value education

UNIT – II **[4 Hrs]**

Inculcation of values - Methods -Dialogue –Writing- Through great Personalities- Religious- Emotional Development - Different stages of Emotions in Human Life and Emotional Maturity

UNIT – III **[5 Hrs]**

Value Education for Social order- School, state and Community – the school and Religious freedom – Equality and Quality in education – Education and Social Reconstruction

UNIT – IV **[4 Hrs]**

Value Education and national goal - Communication, work, service and citizenship- national integration towards united and secular India

UNIT – V **[4 Hrs]**

Yoga -Meaning - Importance -Yoga and Holistic Health- Joint Exercise – Yogasanas – Pranamaya - (any ten basic Yogasanas)

TEXT BOOKS:

1. Value Education – Dr. N.Venkataiah – APH, New DelhI-02 (Unit I – V)

REFERENCE BOOKS:

1. Value Oriented Education – D.Dayakara Reddy – DPH. New Delhi -02

2. Free yourself from tension with Yoga – K.R.Ganesh Babu – AUM Yoga Therapy

15EC301 - PART - III: DIGITAL ELECTRONICS AND APPLICATIONS

Semester	III
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To enable the students to know the various number systems, logic gates and circuits. It is also to encourage the students to learn the concepts of A/D, D/A conversions and memories.

UNIT – I: NUMBER SYSTEMS AND CODES **11**

Digital Vs Analog Signals – Decimal, Binary, Octal, Hexa Decimal Number Systems – Conversions and Arithmetic operations – 1s and 2s Complements – BCD and Arithmetic Operations – Weighted and Non Weighted Codes – Error Detection Code - Error Correction Code – EBCDIC Code – ASCII Code – parity Advantages – Grey Code

UNIT – II: BOOLEAN ALGEBRA AND LOGIC GATES **10**

Basic Operations with Boolean Variables – Boolean Function and Truth Table – Demorgan's Theorem – Simplifications

Logic Gates: AND, OR, NOT, EX-OR –IC Implementations – Universal gate (NAND, NOR)

Graphical representation method: Karnaugh Map Method - Simplifications

UNIT – III: COMBINATIONAL LOGIC CIRCUITS **12**

Arithmetic building block: Half adder – Full adder – Binary Parallel Adder - Half Subtractor - Full Subtractor –Binary Parallel Subtractor

Multiplexer -Demultiplexer -Encoder - Decoder - Implementation through IC modules

UNIT – IV: SEQUENTIAL LOGIC CIRCUITS **10**

Flip Flops: RS, Clocked RS, JK, JK Master-Slave, D and T types.

Shift Register: Serial – Parallel – Universal Shift registers

Counters: Ring – Ripple – Synchronous – Up/Down –Mod 3 – Mod 5 – Decade counter

UNIT – V: D/A, A/D Converters and Memories **12**

DA/Converters: Weighted Resister and Binary Ladder –D/A Converter specifications: definition of Resolution and Accuracy.

A/D Converters: Counter Ramp – Comparator/Flash – Dual Slope – Successive Approximation –A/D converter specifications: definition of Resolution and Accuracy.

Memories: RAM – ROM – PROM – EEPROM – Flash Memory

Total Periods: 55

TEXT BOOKS:

1. Roger L. Tokheim "Digital Electronics Principles and applications", Tata Mc Graw -Hill Pub.Co.Ltd, 8th Edition, 2013 (Unit I, II, V)

2. S. Salivahanan & S. Arivazhagan "Digital Circuits and Design", Vikas pub House, 4th Edition, 2012 (Unit III, IV & V)

REFERENCE BOOKS:

1. Edition Albert P.Malvino and Donald P. Leach, "Digital Principles and Applications", TMH, 7th Edition, 2010.

2. Dr.B.R.Guptha &Vandana Singhal, "Digital Electronics", S.K.Kataria & Sons Millennium Edition, 3rd Edition , July 2012.

3. R.P.Jain "Modern Digital Electronics" Tata Mc Graw-Hill Pub.Co.Ltd, 3rd Edition, 2012

15EC302 -ELECTIVE – I: ELECTRONIC COMMUNICATION - I

Semester	III
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to understand about different wave propagation and various modulation techniques.

UNIT – I: SOUNDS AND MICROPHONES **11**

Nature of sound – Pressure and Intensity of sound waves – Loudness and Phon – Sone – Frequency of sound waves – Pitch –Intervals –Introduction to Microphone – Characteristics of Microphone – Needs of good microphone – Types of Microphones – Comparison of various microphone – Special Microphones.

UNIT – II: RADIO WAVE PROPAGATION **12**

Electromagnetic or Radio Waves – Structure of Atmosphere (Troposphere, Ionosphere) – Ground Wave propagation- Space Wave Propagation- Sky Wave Propagation – Expression for the Refractive index of the Ionosphere, Virtual Height, MUF, Skip zone, Skip Distance.

UNIT – III: AMPLITUDE MODULATION TECHNIQUE **12**

Modulation –Need for modulation: Amplitude Modulation – Amplitude Modulation Index for Sinusoidal AM – frequency Spectrum for Sinusoidal AM – Average Power for Sinusoidal AM – Amplitude Modulator Circuit – Demodulator Circuit - AM Transmitter – Super Heterodyne Principle & Circuit Diagram

UNIT – IV: FREQUENCYAND PHASE MODULATION TECHNIQUES **10**

Frequency Modulation – Sinusoidal FM – Frequency Spectrum for Sinusoidal AM – Average Power in Sinusoidal AM –FM modulator (Varactor Diode Modulator) – FM Transmitter – FM Demodulator (Radio Detector) – Amplitude Limiter – FM Receiver

UNIT – V: SSB MODULATION TECHNIQUES **10**

SSB Principle – Balanced Modulator – Double Balanced diode ring modulator, SSB Generation: Balance Modulator – Filter Method, Phasing Method, Third method – SSB reception

Total Periods: 55

TEXT BOOKS:

1. R.G. Gupta, " Audio,Video Principles, maintenance & troubleshooting" Tata McGraw Hill, 2010.(Unit I)
2. K.D.Prasad, "Antenna and Wave Propagation", Sathyaprakesan, IIIrd Edition 2003. (Unit – II)
3. Dennis Roddy, John coolen, "Electronic Communication" Prentice Hall of India 4th Edition, 2007. (Unit III, IV & V)

REFERENCE BOOKS:

1. Anoke Singh, "Principles of Communication Engineering S.Chand & Company Ltd, 6th Edition 2006.
2. Kennedy Davis, "Electronic Communication System", TATA McGraw Hill Publications, 4th Edition, 2008.

15EC302A -ELECTIVE – I: OPTICAL COMMUNICATION

Semester	III
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To enable the students to understand the various concepts in optical fiber communication and also to learn the working of multi-channel system.

UNIT I: OPTICAL FIBERS **11**

Geometrical description – wave propagation – Dispersion in single mode (SM) and multimode (MM) fibers – Limitations due to dispersion – Fiber Losses – Non liner optical effects

UNIT II: OPTICAL AMPLIFIERS **10**

Concepts- Semiconductor optical Amplifier – Raman and Brillouin amplifier – Fiber amplifiers – Erbium doped amplifiers – System applications

UNIT III: DISPERSION MANAGEMENT **12**

Need – Pre-compensation schemes – Post-compensation techniques – Dispersion compensating fibers – Optical filters – Fiber Bragg gratings – Optical Phase Conjugation – Long Haul lightwave systems – High capacity systems

UNIT IV: MULTICHANNEL SYSTEMS **12**

WDM light wave systems – WDM components – System performance issues – Time Division Multiplexing (TDM) – Sub carrier multiplexing – Code Division Multiple Access (CDMA) – Dense Wavelength Division Multiplexing(DWDM)

UNIT V: COHERENT LIGHTWAVE SYSTEMS **10**

Concepts – Modulation formats – Demodulation formats – Bit Error Rate (BER) – Sensitivity degradation – System performance

Total Periods: 55

TEXT BOOKS:

1. G. Keiser, “Optical fiber communication systems”, McGraw-Hill, 4th Edition, I reprint, 2008 (Unit I, II)
2. H. Franz & V.K.Jain, “Optical Communication Systems”, Narosa Publications, New Delhi, 5th Edition,2013.(Unit III – V)

REFERENCE BOOKS:

1. G.P. Agrawal, “Fiber optic communication systems”, IVth Edition , John Wiley & Sons, New York, 2012
2. H. Franz & V.K. Jain, “Optical communication, Components and Systems, Narosa Publications, New Delhi 2013
3. Subir Kumar Sarkar, “Optical Fibres and Optical Communication Systems”, S.Chand& Company Ltd, Vth Edition 2008.

15EC302B -ELECTIVE – I: WEB TECHNOLOGY

Semester	III
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To encourage the students to understand the concepts of web technology and also to learn the extended markup language (XML) and java server page (JSP).

UNIT – I: INTRODUCTION **11**

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP, and Introduction to JAVA Scripts – Object Based Scripting for the web, Structures – Functions – Arrays – Objects

UNIT – II: DYNAMIC HTML 9 **13**

Introduction – Object refers, Collectors all and Children. Dynamic style, Dynamic position, frames, navigator, Event Model – On check – On load – Onenor – Mouserel – Form process – Event Bubblers – Filters – Transport with the Filter – Creating Images – Adding shadows – Creating Gradients – Creating Motion with Blur – Data Binding – Simple Data Binding – Moving with a record set – Sorting table data – Binding of an Image and table

UNIT – III: MULTIMEDIA 9 **10**

Audio and Video speech synthesis and recognition - Electronic Commerce – E – Business Model – E- Marketing – Online Payments and Security – Web Servers – HTTP request types – System Architecture – Client Side Scripting and Server side Scripting – Accessing Web servers – IIS – Apache web server

UNIT – IV: DATABASE- ASP – XML 10 **11**

Database, Relational Database model – Overview, SQL – ASP – Working of ASP – Objects – File System Objects – Session tracking and cookies – ADO – Access a Database from ASP – Server side Active-X Components – Web Resources – XML – Structure in Data – Name spaces – DTD – Vocabularies – DOM methods

UNIT – V: SERVLETS AND JSP 9 **10**

Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and post request – redirecting request – multi-tier applications – JSP – Overview – Objects – scripting – Standard actions–Directives.

Total Periods: 55

TEXT BOOK:

1. Deitel & Deitel, Goldberg, “Internet and World Wide Web – How to Program”, Pearson Education Asia, 2001 (Unit I – V)

REFERENCES BOOKS:

1. Eric Ladd, Jim O’ Donnel, “Using HTML 4, XML and JAVA”, Prentice Hall of India – QUE, 4th Edition, 2000.
2. Aferganatel, “Web Programming: Desktop Management”, PHI, 2004
3. Raj Kamal, “Web Technology”, Tata McGraw-Hill, 2001

15EC303 -ALLIED – III: COMPUTER PROGRAMMING – I C ++ PROGRAMMING

Semester	III
Credit	4
Max. Marks	CIA -10 CE -40 TOT =50

Objective: To enable the students to learn the knowledge in programming through oops concepts and to understand the trends and principles of programming using C++.

UNIT – I: INTRODUCTION TO OOPS CONCEPT **10**

Principles of Object-Oriented Programming : Software evolution – Procedure-oriented programming – Object-oriented programming paradigm – Basic concepts of OOP – Benefits of OOP – OOP languages – Application of OOP.

UNIT – II: PROGRAMMING FUNDAMENTALS **9**

Beginning with C++ : What is C++ - Application of C++ - Structure of C++ program – Tokens, Expressions and Control Structures : Tokens – keywords – Identifiers – Data types – Declaration of variables – dynamic initialization of variables – Reference variables – Operators – Scope resolution operator – Operator Precedence – Control Structures.

UNIT – III: CLASSES, OBJECTS AND FUNCTIONS **9**

Functions in C++ : The main() function - Function prototype – Call by Reference – Inline functions — Function overloading.

Classes and Objects : Specifying Class – Defining member functions – Array with a class – Static data members – Static member functions - Friend functions.

UNIT – IV: CONSTRUCTORS AND DESTRUCTORS **9**

Constructors and Destructors: Constructors –Types of constructors – Multiple constructors in a class – Dynamic constructors – Destructors, Defining operator overloading function. Inheritance: Defining derived classes – Types of inheritance.

UNIT – V: POINTERS **7**

Pointers: Pointers to objects – this pointer. Managing Console I/O Operators: C++ streams – Stream classes – Unformatted I/O operations – Formatted console I/O operations.

Total Periods: 44

TEXT BOOK

1. E.Balagurusamy, *Object-Oriented Programming with C++*, Tata McGraw Hill publishing company Ltd, 6th Edition 1998.

REFERENCE BOOKS

1. Ravichandran, *Programming with C++*, Tata McGraw Hill publishing company Ltd, 3rd Edition 2011.

2. Robert Lafore, Object Oriented Programming In Turbo C++, Galgotia Publications 2007.

Semester	III
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

15EC304 -PRACTICAL – III: DIGITAL ELECTRONICS

Any 10 Experiments:

1. Verification of Basic gates and Demorgan's Theorem
2. Binary to Gray & Gray to Binary Converters
3. Half Adder & Full Adder
4. Half & Full Subtractor
5. Encoder & Decoder
6. Multiplexer & De-multiplexer
7. Parity Generator & Checker
8. Study of flip flop (RS,D,JK & T)
9. Shift Register & Ring counter
10. Binary Counter
11. Decade Counter
12. Analog to Digital Converter
13. Digital to Analog Converter
14. BCD To Seven Segment Display
15. Soft Switch

Semester	III
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

15EC305 -PRACTICAL – IV: ELECTRONIC PRINCIPLES AND CIRCUITS

Any 10 Experiments:

1. Rectifiers (HW, FW and Bridge Rectifier)
2. Filters (LC and CLC Filters)
3. Common Emitter Amplifier
4. Common Source FET Amplifier
5. Voltage source feedback Amplifier
6. RC coupled amplifier
7. Hartley oscillator
8. Colpitt's oscillator
9. Wein bridge oscillator
10. Astable Multivibrator using transistor
11. Monostable Multivibrator using transistor
12. Bistable Multivibratior using transistor
13. Schmitt trigger
14. DC Regulated Power supply
15. Voltage Doubler

15EC306 -ALLIED PRACTICAL – I: COMPUTER LAB – I: C ++ PROGRAMMING

Semester	III
Credit	2
Max. Marks	CIA -20 CE -30 TOT =50

All the experiments

1. Write a C++ program to read three numbers and display the minimum.

2. Write a C++ program to display first N Fibonocci series.

3. Write a C++ program to add and multiply Two matrices

4. Write a program called 'add' to add two integers. Write another function with the same 'add' to add two floating point values. Write main () function to call both these function one by one, giving suitable values for the arguments and print the values returned by the function.

5. Write a C++ program to find the area of rectangle, triangle and sphere using function overloading.

6. Write a C++ program to define two classes namely expenditure and income. Using friend function find the net income (expenditure must be less than income).

7. Create a class 'item' to contain two class data (i) item code (an integer) and (ii) itemprice(an float).Write two constructor functions, a no argument constructor to

Initialize class data with zero values and a constructor with two arguments assign values for class data. Write a member function getdata() to read values for class data from the keyboard. Write another member function disdata() to display class data.

8. Write a C++ program using inheritance to prepare the pay list for employees.

9. Write a C++ program using pointers to objects to display the sum of two numbers.

10. Write a C++ program using formatted console I/O operation to display the values.

15EC307 -Part – IV: SKILL BASED COURSE – I: ELECTRONIC PRINCIPLES AND CIRCUITS

Semester	III
Credit	3
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To enable the students to understand the principles of electronics and equip them to design circuits

.

UNIT I: RECTIFIERS, FILTERS & VOLTAGE REGULATORS 12

Rectifiers: Half wave rectifier – Full wave rectifier – Bridge rectifier – Ripple factor – Form Factor- Efficiency of Half and Full wave rectifier.

Filters: LC filter – CLC filter – Voltage regulation – DC regulated power supply IC 78XX series and IC 79XX Series.

UNIT II: AMPLIFIERS 11

Transistor Amplifier (Common Emitter) – FET Amplifier (Common Source) – RC Coupled Amplifier – Feedback Amplifier –Power Amplifiers: Transformer Coupled Amplifier - Push Pull Amplifier – Class A, Class B, Class C, Class AB Amplifier.

UNIT III: FEED BACK AMPLIFIER 11

Principle of Feedback Amplifier - Positive Feedback – Negative feedback – Gain Stability – Distortion – Bandwidth – Voltage Series feedback – Voltage shunt feedback - Current Series feedback – Current Shunt feedback.

UNIT IV: OSCILLATORS 11

Oscillator - Comparison between Oscillator and Amplifier – Classification of oscillators – Condition for Oscillation– Hartley Oscillator – Colpitts oscillator – Phase shift Oscillator – Wein Bridge Oscillator- Crystal oscillator.

UNIT V: MULTIVIBRATOR 10

Multivibrator – Astable Multivibrator and its applications – Monostable Multivibrator and its applications – Bistable Multivibrator and its applications – Schmitt Trigger.

Total Periods: 55

TEXT BOOKS:

1. B.L.Theraja, “Basic Electronics Solid State” S.Chand & Company Limited, 5th Edition, 2007. (Unit I, II, &III)

2. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, “Electronic Devices and Circuits”, TATA McGraw Hill, 7th Edition 2013. (Unit IV & V)

REFERENCE BOOKS:

1. V. K. Metha, “Principles of Electronics”, S. Chand and Company Ltd, 3rdEdition, 2011.

15NM01 -NON MAJOR I: PERSONALITY DEVELOPMENT

Semester	III
Credit	2
Max. Marks	CIA -- CE -75 TOT =75*

OBJECTIVES:

1. To understand the concepts, process and importance of personality
2. To gain a knowledge on the dynamics and techniques of personality development
3. To have an insight into self development and environmental factors affecting personality development
4. To help the students to acquaint with the application of communication skills in the world of Business
5. To know the importance of right dressing for the right occasion
6. To get an idea about and have a mock drill on interviews and other selection techniques

UNIT – I: **6**

Personality – Definition – Social and Self concepts of personality – can personality be developed? – Traits and patterns of personality – Social classifications of personality. Factors affecting personality – Environmental factors – Physical factors – Intellectual factors – Emotional factors – Values – Group skills. Dynamics of personality formation – prenatal stage – Nursery stage – Adolescent stage – Adult stage – Old age

UNIT – II: **4**

Successful personality – Meaning – Acquisition and Qualities of a successful personality – Barriers to successful personality – Removing barriers to personality development – Scope, Techniques and Principles of personality development – Personality development – Personality development strategy

UNIT – III: **4**

Self-development – Approach – Aims and Objectives – Self Appraisal – Analysis of social environment – Selection, Formulation and Execution of a plan for self-development

Communication – Importance – objectives – Methods – Principles and Application of communication for personality development

UNIT – IV: **5**

Intricacies of dressing up – Purpose and factors to consider while dressing up – Forms and codes of dress – Approach to dressing up for personality projection

Social Etiquettes – Participation in social events – Interpersonal etiquettes – Meal service and Eating manners – Social graces and customs

UNIT – V: **3**

Interviews – Classification – Self projection in a selection board for interview, Group discussion, Group task, Telecommunication, Video conferences and public addresses.

Total Periods: 22

TEXT BOOK:

1. J.R.Bhatti, "The Dynamics of Personality Development and Projection", Pearson Education 2009 (Unit I – V)

REFERENCE BOOKS:

1. R.M.Omkar, "Personality Development and Career Management – A Pragmatic Prospective", Sultan Chand 2008
2. Robert.M.Sherfield, Rhonda.J.Montgomery and Patricia.G.Moody, "Developing Soft Skills", Pearson Education 2009
3. Dr.S.K.Mandal, "How to Succeed in group Discussion and Personal Interviews", Jaico Publishing House 2005
4. Dr. T.Bharathi, "Personality Development", Neelkamal publications Pvt.Ltd 2008.

15EC401 -ALLIED – IV: COMPUTER PROGRAMMING II: VISUAL BASIC PROGRAMMING

Semester	IV
Credit	4
Max. Marks	CIA -10 CE -40 TOT =50

Objective: To enables the students to learn the Visual Basic environment, controls, programming fundamentals and also to manage database using Visual Basic.

Unit – I: VB FUNDAMENTALS **8**

VB Programming Environment – The user interface form Toolbox – The properties window – The project window – Programming steps – Building and executable file

UNIT – II: WORKING WITH CONTROLS **9**

Textbox control – Command Button Control – File list Box Control – Check Boxes – List Boxes – Combo Boxes – Using an OLE objects – Adding menus by using menu editor – Using Timer objects

UNIT – III: PROGRAMMING FUNDAMENTALS **10**

Dim statement – Input Box – Msg box – Data types – VB Operators – VB Mathematical functions – System clock functions – String functions, IF THEN decision structure – SELECT case decision structure – Using break mode – For Next Loops – Do Loops

Graphics: Line Control – Shape Control – Image Controls

Unit – IV: FUNCTIONS AND MODULES **9**

Working with modules – Writing function procedure – Writing sub procedures – Passing arguments by value – Working with arrays – Creating dynamic array – Multi dimensional arrays – MDI Forms – The use of package and deployment wizard

Unit – V: DATA CONTROL **8**

Managing Access Databases: Create Database Viewer by using the Data Control – Using Record Sets – Add, Delete, Update Records – Search Records – Making a Backup Copy of File

Total Periods: 44

TEXT BOOK:

1. Michael Halvorson, "Microsoft Visual Basic 6.0 Professional Step by Step", Microsoft press 2008.

REFERENCE BOOK:

1. GaryComell, "Visual Basic 6 from the Ground up" TMH Publications, 5th Edition, 2011

Semester	IV
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

15EC402 -PRACTICAL – V: SC – II: INTEGRATED CIRCUITS

Any 10 Experiments:

1. Op-Amp : Inverting and Non- Inverting Amplifier
2. Op-Amp : Adder and Subtractor
3. Op-Amp : Integrator and Differentiator
4. Op-Amp : Current to Voltage Converter and Voltage to Current Converter
5. Instrumentation Amplifier and Schmitt Trigger using Op-Amp
6. Wein Bridge Oscillator
7. Phase Shift Oscillator
8. Monostable Multivibrator using IC 555
9. Astable Multivibrator using IC 555
10. Voltage controlled oscillator
11. Regulated Power Supply using IC 723 (low and high voltage)
12. Function Generator using IC 8038

15EC402A -PRACTICAL – V: SC – II DIGITAL COMMUNICATION

Semester	IV
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

Any 10 Experiments:

1. ASK modulation and Demodulation
2. FSK modulation and Demodulation
3. PSK modulation and Demodulation
4. LAN Network
5. Study of DTE and DCE
6. PCM Technique
7. Study and Configuration of Switches for Network connectivity
8. Study and Configuration of Router and Network connectivity
9. Study of OSI Physical layer
10. Study of OSI Transportation layer
11. Study of OSI Data Layer
12. Study of Hubs and Bridges

Semester	IV
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

15EC402B -PRACTICAL – V: SC – II PC HARDWARE LAB

Any 10 Experiments:

1. Assembly of PC
2. OS Installation
3. Driver Installation
4. DOS Commands
5. Display Problems
6. Keyboard Problems
7. Interfacing ADC with PC
8. Interfacing DAC with PC
9. SMPS Problems
10. Motherboard Problems
11. Study of Mouse
12. Temperature monitoring using PC

Semester	IV
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

15EC403 -PRACTICAL – VI: ELECTRONIC COMMUNICATION LAB

Any 10 Experiments:

1. AM Modulation & Detection
2. FM Modulation using IC 555
3. FM detection using 565
4. Pulse amplitude modulation and detection
5. Generation and detection of PWM
6. Generation and detection of PPM
7. Audio amplifier using IC TBA810
8. Construction of Sync Separator
9. Horizontal and vertical section fault
10. Push pull power amplifier stage of radio receiver
11. Remote control circuit
12. Study of Public Addressing System

Semester	IV
Credit	2
Max. Marks	CIA -20 CE -30 TOT =50

15EC404 -ALLIED PRACTICAL – II: COMPUTER LAB – II: VISUAL BASIC PROGRAMMING

COURSE CODE: All the experiments

1. Develop a program to calculate the simple and compound interest

2. Write a VB program to perform string Manipulation operations like string compare, string length, upper case and lower case.

3. Develop a program to check username and password given by user

4. Develop a program to add and remove item from a list Box and Combo box

5. Develop a program to scroll text from left to right using and display date and time by using timer control

6. Develop a program to convert a Decimal number to Binary number and vice versa.

7. Develop a program to Mini Calculator function

8. Develop a program to Monthly Calendar using Flex Grid Use Employee information for the following projects

9. Develop a program to Insert, delete, update, Move First Record, Move next Record, and Move previous Record in Ms Access database using DAO

10. Develop a program to Insert, delete, update, Move First Record, Move next Record, Move previous Record, and Move last Record in Ms Access database using ADO

15EC405 -SKILL BASED COURSE – II ELECTRONIC COMMUNICATION - II

Semester	IV
Credit	3
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to learn the working of different Audio and video equipments and to develop servicing skills.

Unit – I: INTRODUCTION TO TELEVISION 16

Introduction to television – Picture Transmission – Sound Transmission & Reception – Synchronization – Gross structure – Flicker – Fine structure- Composite video signal – Vestigial side band transmission and reception – Block diagram of TV Transmitter and receiver – Transmission line – BALUN – UHF & VHF tuners – IF stage- AGC – Basic video detector

Compatibility – Natural light – Colour perception - Three colour theory – Luminance, Hue & Saturation – Chromaticity diagram – Camera tube (Image Orthicon) – Picture tube (Delta gun, PIL & Trinitron tubes) – PAL D colour system

Unit – II: SYNC SEPERATOR AND SOUND SECTION 12

Sync separator: Basic principle – Vertical & Horizontal sync separation – Vertical & Horizontal output stage- EHT generation.

Sound Section: Sound signal separation – Sound take off circuit – Inter carrier sound IF amplifier – AM limiter – FM detector

Unit – III: DIGITAL TELEVISION 12

Digital Television-Digital Satellite television-DTH-Digital TV Receiver- DTT-3D-LED TV - Extended Definition Television-HDTV-Cable Television – Flat panel display- Stereo sound system

UNIT – IV: PULSE MODULATION TECHNIQUES 12

Basic Concept of pulse Modulation – sampling theorem – PAM – PWM– PPM– PCM –PFM – PTM – TDM – FDM

Unit – V: STEREOPHONY AND PUBLIC ADRESSING SYSTEMS 14

Stereophony – Stereophony in human systems- practical stereo systems- Stereophonic Recording on disc and reproduction – Stereophonic Recording on tape and reproduction –Public Addressing system- Need and uses - Block diagram of public Addressing system – PAS in public meeting – PAS in football stadium –PAS in Auditorium- PAS in Debating hall

Total Periods: 66

TEXT BOOK:

1. R.R.GULATI, “Modern Television Practice”, Principles, technology and Servicing second Edition New Age International Publishers,2012 (Unit I to III)
2. Dennis Roddy, John coolen, “Electronic Communication” Prentice Hall of India 4th Edition, 2007 (Unit IV)
3. R.G. Gupta, “ Audio,Video Principles, maintenance & troubleshooting” Tata McGraw Hill, 2010. (Unit V)

REFERENCE BOOKS:

1. R.G.GUPTA, “Electronic Instruments and Systems, Principles, Maintenance and Troubleshooting”, TATA McGraw Hill, 2005

Semester	IV
Credit	2
Max. Marks	CIA -- CE -75 TOT =75*

15NM02 -NON MAJOR II: GENERAL AWARENESS

(To be taught during the Second year study of every undergraduate course 2 hours every week)

Course Content:

Important events / dates in the history of the world in general and in Indian in particular importance is also to be given to the local history (History of Tamilnadu)

World Personalities:

Great authors and their important works: Inventions and discoveries; Honors and Awards

Sports, Education, General Science, Geography, Important Technologies, Indian Constitution, National movements

Skills in the following areas:

- Logical Reasoning
- Mental Ability
- Numerical Ability and General Intelligence

Total Periods: 22

TEXT BOOK:

Foundation Course – A: General Awareness – Bharathiar University

REFERENCE BOOKS:

Objective Arithmetic	-	Ravi Chopra
Objective General Knowledge	-	Bright & Phull
Bitmys's General Mental Ability		
Reasoning & Logic	-	Kaushal Goyal
Manorama Year Book		
Success Review & General Knowledge	-	Monthlies

Semester	IV
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

SC – II: ICs AND THEIR APPLICATIONS

Objective: To enable the students to understand the steps in IC fabrication, Logic families and also to learn the working of special purpose ICs like Op-amp and Timer IC and their applications

UNIT – I: IC FABRICATION **14**

Introduction- Classification- Basic Planer Process-silicon wafer Preparation – Epitaxial Growth-Oxidation-Photolithography-Diffusion – Ion Implantation-Isolation Techniques-Metallization-Assembly processing and packaging- IC classification, numbers and identification.

UNIT – II: LOGIC FAMILIES **10**

Basic terms related with digital IC – Logic Families –DTL –DCTL –RTL –HTL –TTL – –Current Sourcing and Current Sinking –ECL gate – IIL gate

UNIT – III: OPERATIONAL AMPLIFIER **14**

Ideal Op-Amp - Inverting and Non-Inverting Amplifier- OPAMP Parameters Comparators-Applications: Summing and Difference Amplifiers-Integrator-Differentiator-Instrumentation Amplifier –Current to Voltage Converter-Voltage to Current Converter-- Wein Bridge Oscillator-Phase Shift Oscillator-Schmitt Trigger

UNIT – IV: TIMER AND PLL **14**

Introduction- Functional Block of IC 555 Timer- Monostable Multivibrator-Application: Frequency divider– Astable Multivibrator – Applications –FSK generator- -Bistable Multivibrator

PLL- Basic Principles-Functional Block of IC 565 Phase Locked Loop and Schematic-Applications: Frequency Multiplier – FM Detector

UNIT – V: SPECIAL PURPOSE IC'S **14**

IC LM 380 Audio Power Amplifier-Block Diagram- IC LM 723 Voltage Regulator – Functional Block- Applications: Low Voltage Regulator – High Voltage Regulator – LM 309 Adjustable voltage regulator– IC 8038 Wave Form Generator-Functional Block Diagram-IC 566 as Voltage Controlled Oscillator

Total Periods: 66

TEXT BOOK:

1. D. Roy Choudhury, Shail B. Jain , "Linear Integrated Circuits", New Age International(p) Limited Publishers, 5th Edition 2014 (Unit I -IV)
2. K.R. Botkar "Integrated Circuits", Khanna Publishers, 5th Edition, 2010 (Unit III – V)

REFERENCE BOOK:

1. Ramakant A. Gayakwad "Op-Amps and Linear Integrated Circuits", Prentice Hall of India Private Limited, 4th Edition, August 2011
2. B.S.Sonde" Introduction to system Design using Integrated Circuits" Wiey Eastern Limited, 5th Edition, 2013.

SC – II: DIGITAL COMMUNICATION

Semester	IV
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To encourage the students to understand the concepts of digital communication and different types of modulation technique.

UNIT – I: INTRODUCTION TO DIGITAL COMMUNICATION 13

Communication Links, Data Communication System, Character Codes, Digital Data rates, Asynchronous and Synchronous data, Binary data Signal, Serial Vs Parallel Communication, Communication Channeling

UNIT – II: PULSE MODULATION 12

Sampling theory and Practice, Modulators and Demodulators, Quantizing of analog signals, PCM generation and Demodulation, FSK and PSK, TDMA, CDMA

UNIT – III: SIGNALING SCHEMES 14

Binary ASK Signaling scheme, Binary PSL Signaling Schemes, Binary FSK Signaling Schemes, Comparison of Digital Modulation schemes, M-ary Signaling schemes – Synchrononization methods

UNIT – IV: DIFFERENT LAYERS AND THEIR FUNCTIONS 14

OSI Layers: Physical Layer, Data Link Layer: Services provided to Network Layer, Medium Access Sublayer, Elementary ideas of framing, Network and Transport Layers

UNIT – V: LAN HARDWARE AND COMPONENTS 13

Bound and Unbound media and its specifications, Switches and Hubs, Bridges and Routers, Structured cabling and Passive Components.

Total Periods: 66

TEXT BOOKS:

1. B.P. Lathi, "Modern Digital and Analog Communication Systems" Wiley Eastern, 3rd Edition, 2015 (Unit I)
2. Proakis J.J. "Digital Communications", Tata McGraw Hill, 5th Edition, 2007 (Unit II, III)
3. A.S. Tenenbaum, "Computer Networks". PHI, 5th Edition, 2014 (Unit IV, V)

SC – II: PC HARDWARE

Semester	IV
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to learn the hardware and troubleshooting techniques of PC.

Unit – I: AN INSIDE LOOKS AT A CONTEMPORARY PC [10 Hrs]

Enclosures – Power supplies – Motherboard and related parts – Video systems – Sound systems – Drive systems – Modems – Input Devices

Unit – II: AN INSIDE LOOK AT OS AND THE BOOT PROCESS [14 Hrs]

The PC hierarchy – Understanding popular OS features – A closer look at MSDOS – The Boot process – Creating a DOS Boot Disk – Window 9x/ME Maintenance tips

Unit – III: DRIVES [14 Hrs]

Principles of magnetic storage – HDD – SCSI Interface – CD ROM drive – Bios Disk drive services

Unit – IV: PERIPHERAL DEVICES [14 Hrs]

Introduction – Keyboard – CRT display monitor – Printer – Magnetic storage devices – Floppy disk drive – Hard disk drive- Hard disk drive – Special Peripherals

Unit – V: INSTALLATION AND PREVENTIVE MAINTENANCE [14 Hrs]

Introduction – Pre installation planning – Installation practice – Routine checks – Special Configuration – Memory up gradation – Hard disk up gradation – Preventive maintenance – System usage.

Total Periods: 66

TEXT BOOK:

1. BIGELOW'S "Troubleshooting, Maintenance & Repairing PCs", Tata McGraw Hill Edition, 5th Edition (Unit I – V)

REFERENCE BOOKS:

1. B. Govindarajalu "IBM PC and Clones, Hardware Troubleshooting and maintenance", Tata McGraw Hill, 5th Edition, 2011
2. N. Mathivanan "Microprocessors PC Hardware and Interfacing" ,PHI , 4th Editon ,2006.

15EC501-MODERN COMMUNICATION SYSTEM

Semester	V
Credit	5
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To help the students to learn about different Advanced Communication systems.

Unit – I: Digital communication systems **11**

Review of sampling theorem – Pulse Code Modulation principles – PCM Transmitting and Receiving system – Differential PCM (DPCM) – Delta Modulation (DM) – Adaptive Delta Modulation – ASK – FSK – PSK – DPSK– QPSK.

Unit – II Microwave communication system **09**

Introduction – Microwave Region and Band Designations-Advantages of Microwaves – Applications of Microwaves–Wave Guides – Types of Wave Guides – Propagation modes.

Unit –III Radar and Navigation **11**

Introduction–Block diagram of Simple Radar– Classification – Radar Range Equation– Antenna Scanning – Plan Position Indicator– Moving Target Indicator– Moving Target Indicator Principle – Doppler Effect– CW Doppler Radar– Frequency Modulator CW Radar.

Unit – IV: Satellite communication system **13**

Introduction – Satellite orbit – Satellite position – uplink – down link – cross link – Assignable satellite frequencies.

Inside satellite: Transponder – Antenna system – power package and station keeping – Forms of modulation –free path space losses – Ground station – Aligning the satellite Dish.

Unit – V: Optical communication system **11**

Introduction to optical fibres – Propagation of light rays through different media – optical acceptance angle and acceptance cone – optical sources (LED, LASER) Structure – optical detectors (Photo diode, Photo transistor) Structure details.

Total Periods: 55

TEXT BOOKS:

1. Anokh Singh,"Principles of communication Engineering " S.Chand & Company Ltd. Seventh Edition 2013 (Unit I and III)

2. M.Kulkarni, "Microwave and Radar Engineering", Umesh Publications, 5th Edition, 2014 (Unit II)

3. Rober J Schoenbeck "Electronic communication system ", Prentice Hall II Edition , 2007 (Unit IV)

4. Subir Kumar Sarkar, "Optical Fibre and Fibre Optic Communication System" S.Chand & Company Ltd. IV edition 2007 (Unit V)

REFERENCE BOOKS:

1. Dennis Roddy, John Coolen – "Electronic Communication",Prentice Hall of India, IV Edition 2012

2. Kennedy Davis – "Electronic Communication System", Tata McGraw Hill Publication, Fifth Edition 2012

Prepared by **Approved by**

(Mrs.K.Poornima) **(Dr.G.Senthil kumar)**

15EC502 - INDUSTRIAL AND POWER ELECTRONICS

Semester	V
Credit	5
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to learn the industrial and power electronics with applications.

Unit – I: Semiconductor Power Device **11**

Principle and Operation of SCR, TRIAC and DIAC – Two transistor model of SCR – Turn ON and Turn OFF methods of SCR – Series and Parallel operation of SCR – Gate Characteristics – Snubber Circuit

Unit – II: Commutation and Firing Circuit **11**

Commutation Circuit – Natural Commutation – Forced Commutation – Self Commutation – External Pulse, Load and Line Side Commutation

Features of Triggering Circuits – Simple R & RC triggering circuit – UJT Pulse triggering circuit – Over voltage, Current and Gate protection circuit

Unit – III: Photo Electric Circuit and Ultrasonic **11**

Photo electric relay – Automatic counting of moving objects – Automatic street light – Burglar Alarm – Flame failure protection – Solar Cell Characteristics

Generation of Ultrasonic waves – Magnetostrictics generator – Piezo electric generator – Applications of ultrasonic waves – Ultrasonic blood flow meter –Ultrasonic Flaw detection.

Unit – IV: Choppers, Inverters and Power Supplies **11**

Choppers – Principle and Operation – Step up operation – Step down operation-Inverters – Principle and Operation – Single Phase bridge inverter, Controlled Rectifiers – Power Diodes-Applications

Power Supply – DC Power Supply – AC Power Supply – Uninterruptable Power Supply – SMPS

Unit – V: Industrial Applications and Timers **11**

Electro Static Dust Precipitator – X Ray Tubes – X Ray Circuits – Industrial Application of X Ray – Stroboscopic Measurement – Noise Measurement – Electro Chemical Application – Application of Emergency Lighting system

Timers – Classification of Timers – Thermal Timers – Electro Mechanical Timers – Electronic Timers.

Total Periods: 55

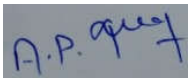
TEXT BOOKS:

1. Mohammed Rashid, "Power Electronics, Circuits, Devices and Applications", Fourth Edition PHI, 2014 [Unit I, II & IV]
2. G.K.Mithal,"Industrial Electronics", Khanna Publication, Nineteenth Edition,2009, [Unit III & V]

REFERENCE BOOK:

1. Biswanath Paul, "Industrial Electronics and Control", PHI III Edition 2014

Prepared by **Approved by**



(Mr.A.P.Ramesh) **(Dr. G. Senthil kumar)**

15EC503A- ELECTIVE – II: DIGITAL SIGNAL PROCESSING

Semester	V
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To enables the students to learn about different types of signals and also know the signal processing techniques.

Unit I: **11**

Signal – Analog, Discrete – Time and Digital signals, Signal Processing Systems – Analog, Discrete and Digital Systems

Review of Laplace Transform, Fourier Transform and their Properties, Convolution – time and Frequency Convolution

Unit II: **12**

Analog Signal Processing Systems: Introduction to Analog Signal Processing, the system function, System Stability, Elementary signal Processing System- Realization of system functions

IIR Filters – Ideal filters – Amplitude oriented design Frequency transformation, Phase oriented design

Unit III **11**

Discrete signals and systems – Sequence and Discrete Systems – Complex convolution – Description of discrete systems – Frequency response, Stability, Bilinear Variable, Difference equation and transfer functions

Unit IV **10**

Digital Filters – Building Blocks, Classification of Digital Filters, Realization structures of IIR Filters, Non-Recursive Realization structures of FIR transfer Functions

Unit V **11**

Concept of Digital Signal Processing – Discrete Fourier Transform, DFT Properties, Computation of DFT. Fast Fourier transform, Applications of signal processing

Total Periods: 55

TEXT BOOKS:

1. Rabiner & Gold, "Digital Signal Processing and Applications", Tata McGraw Hill 2000
2. H.Baher, "Analog and Digital Signal Processing", John Wiley & Sons Electrical Science

REFERENCE BOOKS:

1. S.Salivahanan, A.Vallavaraj, C.Gnanapriya "Digital Signal Processing", TMH, 2th Edition, 2010.
2. John.G.Proakins and Dimites G. Manolaks, "Digital Signal Processing", PHI Publishing, 2003.

Prepared by **Approved by**

(Ms.S.Indira) **(Dr. G. Senthil kumar)**

15EC503B-ELECTIVE – II: ANTENNA AND WAVE PROPAGATION

Semester	V
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To develop the students to learn about different types of antenna and wave propagation techniques.

Unit – I: Fundamentals of Antenna **11**

Antenna Action, Short Electric Doublet, Radiation from doublet Antenna, Thin linear antenna's, Current distribution on resonant and Non- resonant types, Effect of ground: image antenna, Field Strength at a point close to the antenna within the range of direct ray

Unit – II: Antenna Characteristics **11**

Total effective resistance of antenna, Efficiency of an antenna, Directive gain of antenna, Bandwidth, Beam width and Polarization, Ungrounded and Grounded antenna's, Effect of antenna height – Antenna couplers, Dipole arrays- Folded dipole and applications - Non resonant antennas

Unit – III: Types of Antennas **11**

Microwave Antenna's-Antennas with parabolic reflectors, Horn Antenna's, Lens Antenna's, folded dipole – Yagi Uda Antenna, Helical Antenna, Discone antenna, Log-periodic Antenna, Loop antenna, Principle of Broad Band Antenna

Unit – IV: Wave Propagation **11**

Electromagnetic radiation, Propagation of waves; Ground waves, Sky waves, Ionosphere and its effect on radio waves- Space waves, Troposphere Scatter Propagation Extraterrestrial Communications, Skip Distance and Maximum Usable Frequency

Unit – V: Wave guides in Communication **11**

Wave guides: Basic Concepts, Maxwell's Equation Guided waves between Parallel Planes, Attenuation in Parallel Plane guides, Rectangular wave guide; TM mode, TE mode, TE_{10} modes-Boundary Conditions, Circular wave guides, TM & TE mode. Impossibility of TEM waves in wave guides – Transmission Line analogy for wave guides, TEM in coaxial line Comparison of wave guides and Coaxial Line, Resonators

Total Periods: 55

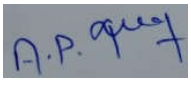
TEXT BOOK:

1. George Kennedy, "Electronic Communication Systems", Tata McGraw Hill , V Edition ,2011 (Unit I – V)

REFERENCE BOOK:

1. E.C. Jordan & K.G. Balman, "Electromagnetic waves and Radiating Systems", Prentice Hall, Second Edition, 2003.

Prepared by **Approved by**



(Mr. A.P.Ramesh) **(Dr. G. Senthil kumar)**

15EC503-ELECTIVE – II: ELECTRONIC DESIGN AND AUTOMATION

Semester	V
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to learn about PCB design and fabrication techniques and also using software for such design.

UNIT – I: BOARD TYPES **11**

Single side board – double side board – multilayer board – plated through holes technology – benefits of surface mount technology (SMT) – limitations of SMT – SMT Components: Resistors, Capacitors inductors and IC's

UNIT – II: LAYOUT AND ARTWORK **12**

Layout: Layout planning – General rules of layout Resistance – capacitance-inductance of PCB conductors - Conducting spacing – Supply and ground conductors – Component placing and mounting – cooling requirement and package density- layout check
Artwork: Basic approaches – Artwork Tapping Guide lines – general artwork rules – Artwork check and Inspection

UNIT –III: LAMINATES CLEANING AND PHOTO PRINTING **12**

Laminates: Manufacture of copper clad Laminates – Properties of Laminates – types of Laminates cleaning: Manual Cleaning Process- Machine cleaning process. Photo printing : Basic process for double side PCB's- Photo resists- Wet film resists – coating process for wet film resists- exposure and Process for wet film resists - Dry film resists

UNIT – IV: ETCHING AND SOLDERING **10**

Etching: Introduction – Etching Machine – Etching system
Soldering: principles of solder connection – solder joints – solder alloys- soldering fluxes-soldering techniques – De-soldering tools and techniques – solder mask – safety , Health and medical aspects in soldering practices

UNIT – V: DESIGN RULES FOR ORCAD EDA TOOL **10**

Electronic Design Automation (EDA) Tool-Schematic Design using OrCAD Capture CIS:- The Drawing canvas, Schematic drawing tools, Schematic Drawing Details, Design Rules Check, The PCB Design:- The building blocks of layout, Layout with OrCAD Layout tool, Board outline creation- Guidelines for PCB Layout.

Total Periods: 55

TEXT BOOKS:

1. Clyde F. Coombs, "Printed Circuits Hand Book", McGraw Hill, III edition 2016 (Unit I)

2. Walter C Bosshart "PCB Design and Technology", TATA McGraw Hill Publication Co. Ltd, Delhi 1983 (Unit II –IV)

3. Shibu K V "Introduction to Embedded Systems" TATA McGraw Hill Publication Co. Ltd, Delhi -2010 (Unit V)

REFERENCE BOOK:

1. R.G. Gupta "Electronic Instruments and System", TATA McGraw Hill Publication Co. Ltd, Delhi 2005.

Prepared by **Approved by**

(Mr.J.Charles babu) **(Dr. G. Senthil kumar)**

15EC504 -PRACTICAL – VII: MODERN COMMUNICATION LAB

Semester	V
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

Any 10 Experiments:

1. Sampling Process
2. Pulse Code Modulation
3. Amplitude Shift Keying
4. Frequency Shift Keying
5. Phase Shift Keying
6. QPSK
7. DPSK
8. Delta Modulation
9. Photo diode characteristics
10. Photo detectors
11. Study of TDM/FDM
12. Study of Optical fiber Communication System

Prepared by

(Mrs.K.Poornima)

Approved by

(Dr.G.Senthil kumar)

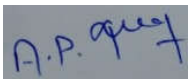
15EC505- PRACTICAL – VIII: INDUSTRIAL AND POWER ELECTRONICS

Semester	V
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

Any 10 Experiments:

1. Characteristics of TRIAC
2. Characteristics of SCR
3. Half wave power control
4. Burglar Alarm
5. Automatic street light controller
6. Design of Emergency Lamp
7. Characteristics of DIAC
8. Switching circuits of SCR (using R & RC only)
9. Commutation Circuits (Self, External, Complementary, Natural)
10. Characteristics of Solar Cell
11. Fan Regulator using DIAC and TRIAC
12. Triggering Circuit using UJT

Prepared by



(Mr. A.P.Ramesh)

Approved by

(Dr. G. Senthil kumar)

15EC506-PRACTICAL IX: 8051 MICROCONTROLLER LAB

Semester	V
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

Any 10 Experiments:

1. Addition of 8/16 bit data
2. Subtraction of 8/16 bit data
3. Multiplication and Division of 8 bit data
4. Sum of array of data
5. Largest and Smallest number in an array
6. Ascending and Descending order
7. Block data transfer
8. Block exchange of data
9. 1's and 2's complement of 8/16 bit data
10. Square root of a Number
11. Rolling / Flashing Display
12. Digital Clock

Prepared by

(Mrs. K. Poornima)

Approved by

(Dr. G. Senthil kumar)

15EC507- Skill Based Course – III: 8051 MICROCONTROLLER

Semester	V
Credit	5
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To enable the students to learn the Microcontroller Architecture and to develop programming skills to interface various external devices.

Unit –I: 8051 Architecture **14**

Introduction to Microcontroller – Microcontroller vs. Microprocessor –Types of Microcontrollers – CISC and RISC Architecture– 8051 Microcontroller Hardware–Oscillator and Clock–Program counter and Data Pointer–CPU Registers–Flags and PSW–Internal Memory-Internal RAM– Stack and Stack pointer– Special Function Registers–Internal ROM.

Unit – II: Instruction set **14**

Data transfer instruction – Logical Operations – Arithmetic Operations –Jump and CALL Instructions.

Unit – III: Addressing Modes and I/O Ports **13**

Immediate Addressing Modes – Register Addressing Modes–Direct Addressing Modes–Indirect Addressing Modes–Port 0–Port 1–Port 2–Port 3.

Unit –IV: Peripherials and Interrupts **14**

Timer and Counter: Timer modes of Operation–Counters–Serial Communication – Data transmission and Reception– Interrupt – Interrupt control –Interrupt Priority – Interrupt Destination.

Unit – V: Real Time Applications **11**

Keyboard Interface – Lead per Key Keyboard–Matrix Keyboard –Seven segment Display–Pulse measurement – D/A Interface – A/D Interface.

Total Periods: 66

TEXT BOOKS:

1. Kenneth J.Ayala," The 8051 Microcontroller, Architecture, Program and Application" Pen ram International Publication, Third Edition 2005 (Unit I– V)

REFERENCE BOOK:

1. Muhammed Ali Mazidi, Janice Gillispie Mazidi, "The 8051 Microcontroller and Embedded systems ", Pearson Education, Low Price Second Edition, 2008.
2. Raj kamal, "Microcontrollers Architecture, Programming, Interfacing and System Design" Pearson Education , Second Edition 2011.

Prepared by **Approved by**

(Mrs. K. Poornima) **(Dr. G. Senthil kumar)**

15EC601- PART III: WIRELESS AND NETWORK COMMUNICATION

Semester	V
Credit	5
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to learn the principles behind the design of wireless communication systems and technologies and also the protocols of network communication.

UNIT –I Introduction to Wireless Communication System 12

Introduction – Examples of wireless communication system: Paging System – Cordless Telephone Systems – Cellular Telephone Systems – Comparison of Common Wireless Communication System

UNIT –II Modern Wireless Communication Systems **10**

Second generation (2G) Cellular networks – Evolution for 2.5G TDMA Standards – HSCSD-GPRS-EDGE-IS-95B

UNIT –III Third Generation (3G) wireless network **10**

Introduction – 3G CDMA 2000- 3G TDSCDMA- Wireless local loop and LMDS-WLAN – Introduction to 4G

UNIT –IV Wireless Networking **12**

Introduction to wireless network – PSTN- Development of wireless networks–first generation wireless networks-second generation wireless networks-Third generation wireless networks- Circuit Switching – Packet switching – X.25 Protocol

UNIT –V Wireless Data Services **11**

CDPD-ARDIS-RMD-Characteristics for RAM mobile data-CCS-Distributed central switching office for CCS-ISDN- Broadband ISDN and ATM

Total Periods: 55

TEXT BOOK:

1. Theodore S.Rappaport "Wireless Communication Principles and Practice "PHI second Editions 2005 Unit (I to V)

REFERENCE BOOKS:

1. William Stallings "Wireless communications & Networks" Pearson-low price Edition-Second Editions 2009
2. Jon W.Mark, Weihua Zhuang "Wireless Communications and Networking" PHI –First Edition 2007

Prepared by **Approved by**

(Mr. J. Charles Babu) **(Dr. G. Senthil kumar)**

15EC602 -PRACTICAL X: SUPPORTIVE COURSE – III: VLSI SYSTEM DESIGN AND VHDL PROGRAMMING

Semester	V1
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

All Experiments

1. Verification of Logic gates
2. Design of Half adder
3. Design of Full adder
4. Design of Half Subtractor
5. Design of Full Subtractor
6. Design of Encoder
7. Design of Decoder
8. Design of Multiplexer
9. Design of De-Multiplexer
10. Design of Simple ALU

Prepared by

(Ms. S. Indira)

Approved by

(Dr. G. Senthil kumar)

15EC602A -PRACTICAL X: SUPPORTIVE COURSE -III: TELECOMMUNICATION SYSTEM

Semester	V1
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

1. Signal Representation in Time & Frequency Domain
2. Pre-emphasis and De-emphasis
3. Implementation of stop and await protocol
4. Transfer of packets between two modes
5. Establishment of socket connection for reliable file transfer
6. Sending and Receiving a message and multimedia through E-mail techniques.
7. Study of video calling using ISDN technique
8. Study of Audio using ISDN techniques
9. Study of switching
10. Study of router

Prepared by

(Mrs.K.Poornima)

Approved by

(Dr. G. Senthil kumar)

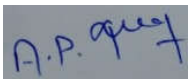
15EC602B -PRACTICAL X: SUPPORTIVE COURSE – III: COMPUTER COMMUNICATION NETWORK

Semester	V1
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

All Experiments

1. Multiplexing Digital signals
2. De-multiplexing Digital System
3. Encoding of Digital Information
4. Decoding of Digital information
5. Analog isolators for Communication
6. Digital isolators for Communication
7. LAN Networks
8. Configuration of Routers and Hubs for connectivity
9. Study of Wi-Fi
10. Network data analysis using wires shots.

Prepared by



(Mr.A.P.Ramesh)

Approved by

(Dr.G.Senthil kumar)

15EC603-PRACTICAL – XI: SENSOR AND MEDICAL ELECTRONICS

Semester	V1
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

Any 10 Experiments:

1. Pressure measurement
2. Load cell measurements
3. Temperature measurements using Thermistor
4. pH meter
5. Ultrasonic range measurement
6. Heart beat monitor
7. IR detector
8. Skin tension monitor
9. Pace Maker
10. Study of sphygmomanometer
11. Study of ECG Recorder
12. Study of Defibrillators

Prepared by

(Mr.J.Charles babu)

Approved by

(Dr.G.Senthil kumar)

15EC604 Practical XII: 8051 INTERFACING TECHNIQUES LAB

Semester	V1
Credit	3
Max. Marks	CIA -40 CE -60 TOT =100

Any 10 Experiments:

1. Parallel port interface
2. Keyboard / Display interface
3. Relay driver interface
4. A/D interface
5. D/A interface
6. Stepper motor controller
7. Traffic light controller
8. Water level controller
9. Object counter
10. Seven Segment Display
11. Speed control of DC motor
12. Stop watch

Prepared by

(Mrs.K.Poornima)

Approved by

(Dr.G. Senthil kumar)

15EC605-SKILL BASED COURSE – IV: SENSOR AND MEDICAL ELECTRONICS

Semester	V1
Credit	3
Max. Marks	CIA -25 CE -75 TOT =100

Objective: This paper enables the students to learn about various types of sensors and bio medical instruments and their applications in medical field.

Unit – I: Sensors and Transducers **14**

Introduction – Types of transducers: Active and Passive – Classifications: Analogue and digital transducers – Temperature sensors: Thermo couple – Thermistors – Electrical transducer: Stain gauge – Piezo Electric Transducer – Inductive transducer – Capacitive transducer – Chemical transducers – Sound transducer

Unit – II: Introduction to Biomedical Instrumentation **15**

Introduction to Man machine interface- Physiological system of body – Problems encountered in measuring a living signals – Sources of bioelectric potential – Resting and action potentials – Propagation of action potential – All or nothing law – Generation of biopotential in various parts of a human body and their characteristics

Unit – III: Electrical Theory and Cardio Vascular Systems **14**

Electrode theory – Bio electric Electrodes: Micro electrodes – Surface Electrodes-Needle Electrodes – Electric Conductivity of Electrodes: Jellies and Creams – Indirect measurement of blood pressure: Sphygmomanometers – Electronic Sphygmomanometers-Measurement of blood flow meter: Ultrasonic blood flow meter

Unit – IV: Biomedical Recorders **10**

General characteristics of recorders – Principles of Electrocardiography – Measuring techniques – Placement of leads and electrodes – Electro phonocardiography – Electroencephalography – Electromyography – Electro retiniography – Electro oculography

Unit – V: Patient Care and Monitoring System **13**

Elements of intensive care monitoring – Heart lung machine – pace makers – Power sources – Defibrillators: AC and DC Defibrillator- Introduction to diathermy – Shortwave diathermy – Ultrasonic diathermy – Microwave diathermy – Introduction to bio telemetry-Block diagram of radio telemetry system – Applications

Total Periods: 66

TEXT BOOKS:

1. Dr. Arumugam," Biomedical Instrumentation", Anuradha Publications Tenth Reprint 2010 [Unit I & V]

2. Leslie Cromwell, Fred J. Weibell, Trich. A. Pfeiffer," Biomedical Instrumentation and Measurement", PHI Publications, New Delhi 2007 [Unit II, III & IV]

REFERENCE BOOK:

1. P.Khandpur, "Handbook of biomedical Instrumentation", TMH, New Delhi 2003.

Prepared by **Approved by**

(Mr.J.Charles babu) **(Dr.G. Senthil kumar)**

SUPPORTIVE COURSE – III: COMPUTER COMMUNICATION NETWORK

Semester	V1
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To help the students to learn about different types of networking techniques and its applications.

Unit – I: Data Communication and Networks **10**

Multiplexing – Signaling – Encoding and Decoding – Error detection and recovery-flow control – Sliding window – Congestion management

Unit – II: Communication Networks **12**

Introduction to networking: Telephone networks – OSI Model – Internet- ATM Network Components: Cables - HUBS – Bridges- Switches- Routers Network topologies – shared medium – Pear to Pear – Hybrid

Unit – III: Network Technologies **12**

Local Area Network Technologies: Ethernet – Technologies- Ethernet version – Ethernet modes of operation – Token Ring Technologies – other LAN protocols Wide Ares Network Technologies: Frame Relay- SMDS – ISDN – SONET – PPP – HDLC – LLC Wireless

Unit – IV: Switches and Routers **11**

Switching: Circuiting switching – Packet Switching – Switching fabric – Bridges – switches- Integrating switching and hubs – Integrating switches and routers

Routing: Routing information – Routing protocols – Hierarchical Routing – Multicast Routing

Unit – V: Protocols and Application **10**

File transfer protocol – TFTP – Domain name system – Dynamic name system – Dynamic host configuration protocol–Simple management – Protocol – Electronic mail – World wide web – HTML – HTTP – RPC and Middleware

Total Periods: 55

TEXT BOOK:

1.Behrouz. A.Forouzan, "Data Communication and Networking", Tata McGraw Hill, New Delhi, 2000 (Unit I – V)

REFERENCE BOOK:

1. James.F.Kurouse & W.Rouse, Computer Networking: A Top down Approach Featuring‖, Addison Wesley, 2009

2. Larry.L.Peterson & Peter.S.Davie, Computer Networks‖ third edition, Harcourt AsiaPvt.Ltd, 2007.

Prepared by **Approved by**

(Mr.A.P.Ramesh) **(Dr.G. Senthil kumar)**

SUPPORTIVE COURSE – III: TELECOMMUNICATION SYSTEM

Semester	V1
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To help the students to learn about different types of telecommunication techniques and its applications.

Unit I: Fundamental of Telecommunications **11**

Introduction – The increase in Telecommunication capacity- EFT-Automated Teller Machines- Medicine-Growth-Telecommunication standards- Structure of Telecommunication network.

Unit II: Electronic Mail and Document **13**

Telex- Teletex- Storage and forward electronic mail- electronic document interchange- document creation- document communication- image communication- Transmission standards- intelligent mail- inter personal messaging service.

Unit III: ISDN services and Applications **11**

Introduction-ISDN services- Computer –integrated telephony-Video telephones- Personal communications-ISDN shortcomings.

Unit IV: Broad band Networks **10**

Introduction- Evolution of ISDN – Switching and Transmission- Broadband ISDN- Channel Types- Implementation plans- Broadband services.

Unit V : AT& T 5ESS Central Office Switch **10**

Modular Design –Switching Module- Communications module –Administrative Module5ESS Network Configuration.

Total Periods: 55

TEXT BOOK:

1. James Marti, "Telecommunication and the Computers" Eastern Economy Edition, PHI, 2001 (Unit I-V).

REFERENCE BOOKS:

1.J. E. Flood, Telecommunications Switching, Traffic and Networks", Pearson Education Asia, 2004

2. T. Viswanathan, Telecommunication Switching Systems", PHI, 2001.

Prepared by **Approved by**

(Mrs.K.Poornima) **(Dr.G.Senthil kumar)**

SUPPORTIVE COURSE – III: VLSI SYSTEM DESIGN AND VHDL PROGRAMMING

Semester	V1
Credit	4
Max. Marks	CIA -25 CE -75 TOT =100

Objective: To enable the students to learn the basic concepts of VHDL and different types of programming techniques using VHDL.

Unit – I: Design units: **12**

Introduction -- Entity declaration -- Architecture body -- Structural style of modeling --Dataflow style of modeling -- Behavioral style of modeling -- Mixed style of modeling.

Unit – II: Basic language elements: **12**

Identifiers: - Basic Identifier -- Extended Identifier - Data objects:- Classes - Constants-Variable – Signal – File. Data types:- Scalar – Composite – Access- File and their declarations

Unit – III: Operators: **10**

Logical operators -- Relational operators -- Shift operators -- Adding operators -- Multiplying operators -- Miscellaneous operator

Unit – IV: Programming model **11**

Process statement -- Variable assignment statement -- Signal assignment statement -- If statement -- Case statement -- Loop statement

Unit – V: Hardware modeling representation **10**

Adder – Subtractor – Encoder – Decoders – Multiplier -- Shift register – Counter -- ALU design

Total Periods: 55

TEXT BOOK:

1. J. Bhasker, "VHDL Primer" III Edition, PHI, Six impression 2009 (Unit I to V)

REFERENCE BOOKS:

1. Dougles L. Perry, "VHDL", IV Edition, Tata McGraw Hill, 2002.

Prepared by **Approved by**

(Ms. S.Indira) **(Dr.G. Senthil kumar)**