DEPARTMENT OF ELECTRONICS

SRI RAMAKRISHNA

COLLEGE OF ARTS AND SCIENCE, (Autonomous)
Formerly SNR Sons College

(Affiliated to Bharathiar University)
[Re- Accredited with 'A' grade by NAAC]
[An ISO 9001:2008 Certified Institution]
Coimbatore – 641 006.

B.Sc ELECTRONICS AND COMMUNICATION SYSTEMS

SYLLABUS

EFFECTIVE FORM 2016-17

S.N.R. SONS COLLEGE (Autonomous)

(Affiliated to Bharathiar University)
(Re-Accredited with 'A' Grade by NAAC)
(An ISO 9001:2008 Certified Institution)
S.N.R. College Road, Coimbatore-641 006, Tamil Nadu, India.
Phone: (0422) 2562788 Fax: (0422) 2560387 Website: www.snrsonscollege.org

"Scheme of Examination along with Distribution of Marks and Credits"

CBCS PATTERN

UNDER GRADUATE PROGRAMMES

B.Sc Electronics and Communication System Degree Course

(For the students admitted during the academic year 2016 - 2017 and onwards)

Part	Study Components: Course Title with Corse Code.	CIA	CE	Total	Credit
	SEMESTER I				
I	**Language:16T01** Tamil – I /**16H01** Hindi – I / **16F01** French – I / **16M01** Malayalam – I	30	70	100	3
II	**16E01** English for Communication – I	30	70	100	3
III	**16EC101** Basic Electronics	30	70	100	3
III	**16EC102** Electric Circuits & Network Analysis	30	70	100	3
III	**16EC103** **Practical I:** Components and Network Analysis	30	70	100	4
III	**16EC104** **Allied I:** Mathematics – I	30	70	100	3
IV	**16ES01** Environmental Studies	100	-	100**	1
IV	**16CPE01** PACE I	-	100	100**	1
IV	**16ECJC1** JOC I				1[s]
	SEMESTER II				
I	**Language:16T02** Tamil – 2 / **16H02** Hindi – 2 /**16F02** French – 2 / **16M02** Malayalam – 2	30	70	100	3
II	**16E02** English for Communication – II	30	70	100	3
III	**16EC201** Electronic Devices	30	70	100	3
III	**16EC202** Digital Electronics and Applications	30	70	100	3
III	**16EC203** **Practical II :** Electronic Devices	30	70	100	4
III	**16EC204** **Allied II :** Mathematics – II	30	70	100	3
IV	**16VE01**Value Education			100**	1
IV	**16CPE02** PACE II		100	100**	1
IV	**16ECJC2** JOC II				1[s]

	SEMESTER III				
III	**16EC301**Electronic Principles and Circuits	30	70	100	4
III	**16ECC02** **Practical III:** Digital Electronics	30	70	100	4
III	**16EC302** **Practical IV:** Electronic Principles and Circuits	30	70	100	4
III	**OPEN ELECTIVE I**	30	70	100	3
III	**16EC303Allied III:** Computer Programming I [C &C++Programming]	15	35	50	2
III	**16EC304 Allied Practical I:** Computer Lab- I C &C++ Programming	15	35	50	2
III	**16EC305Skill Based Course – 1:** Electronic Communication – I	30	70	100	3
IV	**16BT01**Basic Tamil I **16AT01**Advanced Tamil I	100		100**	1[s]
IV	**16CPE03** PACE III	-	100	100**	1
IV	**16ECJC3** JOC III				1[s]
	SEMESTER IV				
III	**16EC401**Instruments and Measurements	15	35	50	2
III	**16EC402**ICs and their Applications	30	70	100	4
III	**16EC403** **Practical V:** Electronic Communication	30	70	100	4
III	**16EC404** **Practical VI:** Integrated Circuits.	30	70	100	4
III	**Elective I**	30	70	100	4
III	**16EC405Allied IV:** Computer Programming II [Visual Basic Programming]	15	35	50	2
III	**16EC406 Allied Practical II :** Computer Lab II: Visual Basic Programming	15	35	50	2
IV	**16EC407 Skill Based Course – 2 :** Bio Medical Instrumentation.	30	70	100	3
IV	**16BT02** Basic Tamil II **16AT02** Advanced Tamil II	100		100**	1[s]
IV	**16CPE04** PACE IV		100	100**	2
IV	**16ECJC4** JOC IV				1[s]

	SEMESTER V				
III	**16EC501** Modern Communication system	15	35	50	2
III	**16EC502** 8051 Microcontroller	30	70	100	5
III	**16EC503** **Practical VII:** Industrial and Power Electronics	30	70	100	4
III	**16EC504Practical VIII:** 8051 Microcontroller	30	70	100	4
III	**16EC505** **Practical IX:** Bio Medical Instrumentation	30	70	100	4
III	**OPEN ELECTIVE II**	30	70	100	3
IV	**16EC506Skill Based Course – 3 :** Industrial and Power Electronics	30	70	100	3
IV	**16CPE05** PACE V		100	100**	2
IV	**16ECJC5** JOC v				1$
	SEMESTER VI				
III	**16EC601** VLSI system Design and VHDL Programming	30	70	100	5
III	**16EC602Practical X:** VHDL Programming	30	70	100	4
III	**16EC603Practical XI:** Modern communication	30	70	100	4
III	**Elective II**	30	70	100	4
III	**16EC604 Skill Based Course – 4:** Wireless and Network communication.	30	70	100	3
III	**16EC605 Mini Project**	80	20	100**	3$
V	**Extension Activities:** **16NS01** NSS/ **16NC01** NCC/ **16SP01** SPORTS/ **16YR01** YRC/ **16 RR01** RRC / **16SI01** SIS #	100	-	100**	1

$$ Extra credit courses for the candidates who opted other languages in Part – I

 # No Comprehensive Examinations. Only Continuous Internal Assessment (CIA)

@ No Continuous Internal Assessment (CIA). Only Comprehensive Examinations.

**** Marks will not be included in CGPA calculations.**

$ Extra credit courses

Elective – I	**16ECE01**Electronic Data & Audio Video Communication
	16ECE02 Material Science
	16ECE03 Mobile communication
Elective – II	**16ECE04** Electronic Design Automation
	16ECE05 Embedded Systems
	16ECE06 Telecommunication Switching and Networks

List of Open Elective papers offered by the department	
Open Elective – I	**16ECI01** Mobile Phone Servicing
Open Elective – II	**16ECI02** Advanced PC Hardware

Summary

Part	Subject	Papers	Credit	Total credits	Papers	marks	Total marks
Part I	Languages	2	3	6	2	100	200
Part II	English	2	3	6	2	100	200
Part III	Core	21	78	92	21	2000	2400
	Allied	6	14		6	400	
	OPEN ELECTIVES	2	3	6	2	100	200
	Electives	2	4	8	2	100	200
	Skill Based	4	3	12	4	100	400
							3600
	Lang.	2	1	2[$]	2	100	200**
Part IV	PACE	3	1	3	5	100	500**
		2	2	4			
	EVS & VE	2	1	2	2	100	200**
Part V	@ Extension	1	1	1	1	100	100**
	Total			**140**			

$ - Extra credit courses **-NOT INCLUDED IN TOTAL MARKS

CIA: Continuous Internal Assessment

CE: Comprehensive Examination

Total Marks for the Programme: 3600

Total Credits for the Programme: 140

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

Semester	I
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

16EC101 BASIC ELECTRONICS

COURSE OBJECTIVE

- To become familiar with fundamentals of electronic components.
- To learn to use common electronic components.
- To design electronic circuits to perform realistic tasks.

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 [13 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 [12 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 [13 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, Revise I Edition, 2008 (Unit I, II, III & V)

2. S.P.SHARMA, "Basic Radio and Television Colour & B/W" Tata Mcgraw Hill Publishing, 5th Edition 2007 (Unit IV)

REFERENCE BOOKS

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, 10th Edition, 2008.

2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2nd Edition 2011.

COURSE OUTCOME

On completion of this course the students will be able to **Total Periods: 60**

- Identify electronic components
- Differentiate and demonstrate the voltage and current source.
- Put into practice and use the electronic components

16EC102 ELECTRIC CIRCUITS & NETWORK ANALYSIS

Semester	I
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

COURSE OBJECTIVE

- To enable the students to learn the basic concept of various electric circuits and to analyze different network theorems.
- To grab the knowledge of transient response of series and parallel AC circuits.

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 [12 Hrs]

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

UNIT III: ELECTRICAL CIRCUITS [10Hrs]

Series circuit – resistance in series- series I.R voltage drops – series voltage divider – total power in a series circuit – opens in a series circuit – shorts in series circuit - Parallel circuit- resistance in parallel circuit – equivalent resistance of a two branched circuit – total power in a parallel circuit- – opens in a parallel circuit – shorts in parallel circuit – Series parallel circuit.

UNIT IV: NETWORK THEOREMS [13 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 V: AC CIRCUITS [13 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, Revise Edition, 2008

REFERENCE BOOK:

1. Bernard Grob, "Basic Electronics" Mc Graw Hill, 10th Edition, 2008

COURSE OUTCOME

On completion of this course the students will be able to **Total Periods: 60**

- Design simple electric circuits and to analyze the network theorems.
- Analyze various electric networks by using theorems.
- Develop the electric circuits applications by using the principles.

16EC103 PRACTICAL – I: COMPONENTS AND NETWORK ANALYSIS

Semester	I
Credit	4
Max. Marks	CIA -30 CE -70 TOT =100

COURSE OBJECTIVE

- To understand the fundamental principles of circuit theory
- To make use of circuit laws and theorems and measuring the circuit parameters.

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 Kirchhoff'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

COURSE OUTCOME

On completion of this course the students will be able to

- Apply the concept of basic circuit and theorems
- Simplify the circuits using series and parallel equivalents and using Thevenin's and Norton's equivalent circuits.
- Design resonance circuits.
- Use the oscilloscope for the display and measurements of signals.

ALLIED - I

16EC104 MATHEMATICS - I

Semester	I
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

COURSE OBJECTIVES

- To train the students on Matrices, Calculus, Laplace transforms and Fourier series.

UNIT I MATRIX ALGEBRA (10)

Basic concepts – Different types of matrices – Operation on matrices – Inverse of a matrix – Rank of Matrix - Eigen values and Eigen vectors, Cayley Hamilton Theorem.

UNIT II DIFFERENTIAL CALCULUS (13)

Basic Concepts - Successive differentiation-n^{th} derivative of standard functions-Partial Differentiation-Homogenous functions, Euler's Theorem-Maxima and Minima

UNIT III INTEGRAL CALCULUS (12)

Basics – Integration, Definite Integration – Integration by partial fraction and by parts, Reduction formula (simple problems).

UNIT IV LAPLACE TRANSFORMS (12)

Definition of Laplace Transforms – Properties of Laplace transforms – Inverse of Laplace transforms – Application of Laplace Transforms to solve ordinary differential equations.

UNIT V FOURIER SERIES (8)

Dirchlet's conditions – General Fourier series of the function in $(0,2\pi)$ and $(-\pi,\pi)$ – Odd function and Even function – Half range Fourier series .

COURSE OUTCOME **Total Periods: 55**

After the completion of the course students should have gained knowledge about

- ❖ Formulate problems on Matrices
- ❖ Evaluate the problems on Differential Calculus
- ❖ Evaluate the problems on Integral Calculus
- ❖ Solve the ODE problems using Laplace transforms
- ❖ Explain the Fourier series and its applications.

TEXT BOOKS

1. Dr.M.K. Venkataraman, "Engineering Mathematics Vol. II " National Publishing Company, 4th Ed 2011– (**Unit I,III**)
2. G.Balaji, "Engineering Mathematics – I " Balaji Publishers, 5th edition 2009 - (**Unit II**)
3. G.Balaji, "Engineering Mathematics – II " Balaji Publishers, 5th edition 2009 - (**Unit IV**)
4. G.Balaji, "Engineering Mathematics – III " Balaji Publishers, 5th edition 2009- (**Unit V**)

16ES01 ENVIRONMENTAL STUDIES

Semester	I
Credit	1
Max. Marks	CIA - 100 TOT = 100

COURSE OBJECTIVES

To equip the students in understanding various aspects of the environment and how environment could be applied in finding sustainable solutions to environmental issues. To learn the concepts in ecology and environmental engineering, to apply these concepts in sustainable development and restoration of ecology and environment.

- Outline the concepts of ecosystem and environmental interactions
- Understand the ecosystem functions
- To understand the role of various environmental pollutants and its effects.

Unit I: **(2)**

Multidisciplinary nature of environmental studies: Definition, scope and importance, Need for public awareness.

Unit II : **(5)**

Ecosystems-Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Food chains, food webs and ecological pyramids. Types of ecosystem Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit III : **(6)**

Environmental Pollution – Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards.Solid waste Management : Causes, effects and control measures of urban and industrial wastes. Disaster management : floods, earthquake, cyclone and landslides.

Unit IV : **(5)**

Social Issues and the Environment - Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Environmental Issues in Coimbatore District (Noyyal River and Dye Industries). Environmental ethics : Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents. Environment Protection Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation.

Unit V : **(4)**

Human Population and the Environment - Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights Women and Child Welfare, Role of Information Technology in Environment and human health.

Total Periods: 22

COURSE OUTCOME

On completion of this course the students will be able to

- Identify the key concepts in ecosystems management
- Summarize wastewater characteristics and treatment protocols
- Outline the concepts of ecosystem and environmental interactions
- Understand the ecosystem functions
- Development of sustainable ecosystems

REFERENCE:

1. Textbook for Environmental Studies for Undergraduate Courses of all Branches of Higher Education Erach Bharucha for University Grants Commission
2. Thangamani. A and Shymama. T, A Text Book of Environmental Studies, 2nd Ed, DPH, New Delhi, 2006.
3. Environmental Studies for Undergraduate Course – Bharathiar University.
3. Environmental Studies for Undergraduate Course – Bharathiar University.

Semester	II
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

16EC201 ELECTRONIC DEVICES

COURSE OBJECTIVE

- To enable the students to understand and gain the knowledge on semiconductor devices.
- To acquaint the students with construction, theory and characteristics of the electronic devices.

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 [12 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 [12 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

Applications: Transistor as a switch.

UNIT V: FET & UJT [13 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", S. Chand & Company Ltd, Revise I Edition, 20082. S.
2. S.Salivahanan, N.Sureshkumar, A. Vallavaraj, "Electronic Devices and circuits", Tata Mc Graw Hill, 2nd Edition 2011.

REFERENCE BOOKS:

1. V. K. Metha, "Principles of Electronics", S. Chand and Company Ltd, 11th Edition, 2008.
2. Louis Nashelsky and Robert Boylestad, "Devices discrete and Integrated", PHI Edition

COURSE OUTCOME

On completion of this course, the students will be able to **Total Periods: 60**

- Explain the structure of the basic electronic devices
- Know the characteristics and operations of semiconductor devices.
- Use the special diodes for various applications.

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Semester	II
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

16EC202 DIGITAL ELECTRONICS AND APPLICATIONS

COURSE OBJECTIVE

- To enable the students to know the number systems, codes, methods for simplifying Boolean expressions, logic gates and circuits.
- To outline the formal procedures for the analysis and design of combinational circuits and sequential 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 [12 Hrs]

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 [12 Hrs]

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 Hrs]

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 [12 Hrs]

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 Hrs]

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

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 Ed 2010
2. Dr. B.R.Guptha &Vandana Singhal, "Digital Electronics", S.K.Kataria & Sons Millennium Ed,2000
3. R.P.Jain "Modern Digital Electronics" Tata Mc Graw-Hill Pub.Co.Ltd, III Edition, 2012.

COURSE OUTCOME

On completion of this course, the students will be able to **Total Periods: 60**

- Realize different logic gates and analyzing the outputs.
- Demonstrate the knowledge of Boolean algebra including algebraic manipulation/simplification, and application of DeMorgan's theorems and Karnaugh map reduction method.
- Analyze and design the combinational and sequential logic circuits

16EC203 PRACTICAL – II: ELECTRONIC DEVICES

Semester	II
Credit	4
Max. Marks	CIA -30 CE -70 TOT =100

COURSE OBJECTIVE

- To understand and experiment the basic parameters of electronic devices.
- To construct few applications using semiconductor devices.

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

COURSE OUTCOME

On completion of this course, the students will be able to

- Experiment the fundamental operations of the main semiconductor electronic devices.
- Design and construct electronic circuits using semiconductor devices.

Semester	II
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

ALLIED II

16EC204 MATHEMATICS – II

COURSE OBJECTIVES

- To enable students to understand second order linear differential equations, numerical methods, special functions and complex numbers.

UNIT I DIFFERENTIAL EQUATION (12)

Second Order linear differential equations with constant coefficients. Particular integrals of the form e^{kx}, x^k, sinkx, coskx only.

UNIT II NUMERICAL METHODS (10)

Solving simultaneous equations – Gauss Elimination method, Gauss Jordan method, inverse of a matrix using Gauss Elimination method, Gauss Jacobi and Gauss Seidel methods..

UNIT III INTERPOLATION, NUMERICAL DIFFERENTIATION AND INTEGRATION (13)

Interpolation : Newton's forward and backward interpolation.

Numerical Differentiation : Newton's forward and backward formula to compute the derivative, Stirling's formula.

Numerical Integration : Trapezoidal rule , Simpson's $1/3^{rd}$ rule (No Derivation) – Simple problems.

UNIT IV SPECIAL FUNCTIONS (10)

Beta and Gamma functions – definitions – Relationship between Beta and Gamma functions – Properties of Beta and Gamma functions – Simple problems.

UNIT V COMPLEX NUMBERS (10)

Definition of complex numbers – Modulus – Amplitude form – Demorvie's Theorem (simple problems) – Expansion of $\sin(n\theta)$, $\cos(n\theta)$, $\sin^n(\theta)$, $\cos^n(\theta)$.

COURSE OUTCOME **Total Periods: 55**

On completion of this course, the students will be able to

- ❖ Solve the Second Order linear differential equations.
- ❖ Solve the problems in numerical methods.
- ❖ Derive the problems on numerical differentiation and integration.
- ❖ Gain knowledge about special functions.
- ❖ Expand trigonometrical functions.

TEXT BOOKS

1. Dr. M.K. Venkataraman, "Engineering Mathematics Vol. II ", National Publishing Company, 4^{th} edition 2011 (**Unit I**)
2. Dr. M. K. Venkataraman "Numerical methods in Science and Engineering", National Publishing Company , 1^{st} edition 2011 (**Unit II & III**)
3. Dr. M.K.Venkataraman, " Higher Mathematics for Engineering and Science", National Publishing Company 2011 (**Unit IV – Special Functions**)
4. Dr. M.K.Venkataraman, "Engineering Mathematics Vol. I", National Publishing Company 2011 (**Unit V – Complex numbers**)

16VE01 VALUE EDUCATION
(Common to all UG courses)

Semester	II
Credit	3
Max. Marks	CIA -30 CE -70 TOT =100

COURSE OBJECTIVES

- To orient about the society, social life, integrity in personal and public life.
- To learn the concepts of human values and respect for others
- To provide in-depth understanding about moral awareness
- To inculcate a sense of socially responsible citizens.

UNIT - I VALUE EDUCATION & HUMAN EDUCATION 4

Value Education - Definition - relevance to present day - Concept of Human Values - Self Introspection - Self Esteem

UNIT – II SOCIETY & FAMILY VALUES 4

Structure and components of Society - Marriage and Family Values - Neutralization of Anger, Adjustability - Threats of family life.

UNIT - III ETHICS & LEADERSHIP QUALITIES 4

Ethical values: Ethics, Social Ethics, Public Policy - Leadership qualities: Integrity, Character, Courage - Personality development – Respect for Inter – culture.

UNIT - IV SOCIAL VALUES 4

Social Values, Faith, Service, Commitment and Decency - Fundamental Rights and Responsibilities of citizens

UNIT - V SOCIAL PROBLEMS AND ROLE OF STUDENTS 4

Social Problems: Definition - Poverty, Illiteracy, Unemployment, Exploitation, Obscenity, Immorality - Crimes and Online Crimes - Student unrest, Ragging and Peaceful Campus - Role of Students in tackling social problems

Course Outcome **Total Periods : 20**

On completion of this course, the students will be able to

- Develop a sense of self-respect and respect for others
- Able to occupy one's own social space and help others live peacefully
- Develop scientific temper and logical reasoning and to apply in day to day life

REFERENCE BOOKS

1. Mani Jacob (Ed). 'Resource Book for Value Education', Institute for Value Education, New Delhi. 2002.
2. NCERT. "Value Education". Dharma Bharti National Institute of Peace and Value Education, Secunderabad, 2002.
3. Daniel and Selvamony. "Value Education Today - Madras Christian College, Tambaram and ALACHE, New Delhi, 1990.
4. Ignacimuthu S. "Values for Life". Better Yourself Books, Mumbai, 1991.
5. M.M.M.Mascaronhas. Centre for Research Education Science and Training for Family Life Promotion - Family Life Education, Bangalore, 1993.

16EC301 ELECTRONIC PRINCIPLES AND CIRCUITS

Semester	**III**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70**

COURSE OBJECTIVE

- To enable the students to understand the principles of Electronics and Equipment to design circuits.
- To Understand the concept of Amplifiers and able to design Oscillators

UNIT I: RECTIFIERS, FILTERS & VOLTAGE REGULATORS 13

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 12

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 12

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 12

Multivibrator – Astable Multivibrator and its applications – Monostable Multivibrator and its applications – Bistable Multivibrator and its applications – Schmitt Trigger.

COURSE OUTCOME Total Periods (55+5T): 60

On completion of this course, the students will be able to

- Design Filter Circuits.
- Classify the Amplifiers.
- Design oscillator based on the applications.

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.

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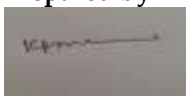

(Mrs. K. Poornima) (Dr. G Senthil kumar)

16EC302 -PRACTICAL – IV ELECTRONIC PRINCIPLES AND CIRCUITS

Semester	**III**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70**

COURSE OBJECTIVE

- To Understand the concept of Rectifiers & filters circuits
- To develop the specific amplifier and oscillator circuits.
- To acquire knowledge of Multivibrator circuits.

Any 10 Experiments:

1. Rectifiers (HW, FW and Bridge Rectifier)
2. Filters (LC and CLC Filters)
3. Common Emitter Amplifier
4. Voltage source feedback Amplifier
5. RC coupled amplifier
6. Hartley oscillator
7. Colpitt's oscillator
8. Wein bridge oscillator
9. Astable Multivibrator using transistor
10. Schmitt trigger
11. DC Regulated Power supply
12. Voltage Doubler

COURSE OUTCOME

On completion of this course, the students will be able to

- Design Regulated power supply and amplifier circuits.
- Construct all multivibrator circuits.
- Apply the principle of oscillator in designing various oscillator circuits.

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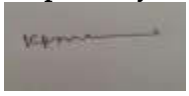

(Mrs. K. Poornima)

Approved by

(Dr. G Senthil kumar)

16EC303 -ALLIED – III: COMPUTER PROGRAMMING – I
[C &C ++ PROGRAMMING]

Semester	**III**
Credit	**2**
Paper Type	**Allied**
Max. Marks	**CIA -15** **CE -35** **TOT =50**

OBJECTIVES

- To enable students to learn about the basic features of C Programming Language
- To learn the various decision making and looping statements
- To learn how to program using arrays and functions
- To learn about structures and pointers
- To learn file management and preprocessor in C
- To inculcate knowledge on Object-Oriented programming concepts using C++.
- Topics include pointers, classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features.

UNIT – I **9**

Overview of C: History – Importance —Sample programs- Structure of a C Program – Programming Style

Constants, Variables and Data Types: Character set - C Tokens – Constants, Variables and Data Types.

Operators and Expressions: Operator and Expressions

Decision making and Branching: Decision Making with IF – Simple IF – The IF…ELSE Statement – Nesting of IF….ELSE Statements – ELSE IF Ladder – Switch Statement - ? Statement – GOTO Statement

Decision Making and looping: While Statement – DO Statement – FOR Statement

UNIT – II **9**

Arrays: Declaring and Initializing Arrays – Declaring and Initializing One Dimensional Array – Declaring and Initializing of Two Dimensional Arrays – Multidimensional Arrays.

User Defined functions: Elements of User Defined Function – Definition of Function – Return Values and Types – Function Call and Declaration - Category of Functions – Recursion

UNIT – III **9**

Structures and Unions: Definition of Structure – Declaring Structure Variable – Accessing Structure Member – Structure within Structure – Structures and Function – Union.

Pointers: Understanding Pointers – Accessing the Address of the Variable – Declaring and initializing pointer variable – Accessing Pointer Variable.

UNIT – IV: Introduction To Oops Concept **9**

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. Beginning with C++: What is C++ - Application of C++ - Structure of C++ program – Operators – Scope resolution operator – Operator Precedence?

Programming Fundamentals: 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 – V: Constructors and Destructors **8**

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.
File Management: Defining and Opening the File – Closing a File – I/O Operation on File - Command Line Arguments.

COURSE OUTCOME **Total Periods :44**

On completion of this course, the students will be able to

- Explain the basics of programs and programming
- Select appropriate data types and control structures for solving a given problem.
- Illustrate the representation of arrays, strings and usage of string operations.
- Knowledge of pointers and dynamic memory allocation.
- Explain the basics of file handling mechanism.
- Differentiate between structures oriented programming and object oriented programming.
- Use of object oriented programming language like C++ and associated libraries to develop object
- oriented programs
- Understand and apply various object oriented features like inheritance, data abstraction,

TEXT BOOK:

1. E.Balagurusamy"Programming in ANSI C", 4thEd., Tata McGraw - Hill Publications ,2013. (Unit I – III)
2. E.Balagurusamy" Object-Oriented Programming With C++"- TataMcGrawHill Publishing Company Ltd,2013. (Unit IV ,V)

REFERENCE BOOKS :

1. YashavantKanetkar, "Let us C",3rd Ed., BPB Publications.
2. Gottfried ,"Programming with C", 2ndEd.,TMH Publications

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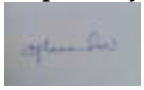

(Mr. N. Mahendiran) (Dr. G. Senthil kumar)

16EC304 -ALLIED PRACTICAL – I: COMPUTER LAB – I: C &C ++ PROGRAMMING

Semester	**III**
Credit	**2**
Paper Type	**Allied**
Max. Marks	**CIA -15** **CE -35** **TOT =50**

OBJECTIVES

- To be familiar with programming in C Language
- To understand various programs using decision making and looping statements
- To understand simple programs using arrays and functions
- To understand simple programs in structures, pointers and file management

Perform all Programs

1. Write a C program to find the Compound Simple interest and interest.

2. Write a C program to find the Maximum and Minimum of a given set of numbers

3. Write a C program to find the Sum, Average and Standard deviation for a given set of numbers

4. Write a C program to solve Quadratic Equation.

5. Write a C program to check whether the string is a palindrome or not

6. Write C++ programs to illustrate the concept Arrays

7. Write C++ programs to illustrate the concept Inline functions

8. Write C++ programs to illustrate the concept Objects and Classes

9. Write C++ programs to illustrate the concept operator overloading functions

10. Write C++ programs to illustrate the concept Friend Function

COURSE OUTCOME

On completion of this course, the students will be able to

- Upon successful completion of the course students will have
- An understanding of basic programming concepts
- An ability to write simple programs using control structures, arrays and functions
- An ability to implement simple programs using pointers and file concepts.

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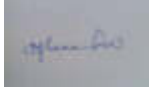

(Mr. N. Mahendiran) (Dr. G. Senthil kumar)

16EC305 –Skill Based Course – I: ELECTRONIC COMMUNICATION

Semester	**III**
Credit	**3**
Paper Type	**Skill Based**
Max. Marks	**CIA -30** **CE -70**

OBJECTIVE

- To understand the concept of radio wave propagation.
- To acquire knowledge on Amplitude and Frequency modulation.
- To inculcate the principle of Antennas.

UNIT – I: RADIO WAVE PROPAGATION 11

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 – II: AMPLITUDE MODULATION TECHNIQUE 11

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 – Audio amplifier

UNIT – III: FREQUENCYAND PHASE MODULATION TECHNIQUES 11

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 – IV: SSB MODULATION TECHNIQUES 11

SSB Principle – Balanced Modulator – Double Balanced diode ring modulator, SSB Generation: Balance Modulator – Filter Method, Phasing Method, Third method – SSB reception

UNIT – V ANTENNAS 11

Basic Consideration – Electromagnetic radiation – The elementary doublet – ungrounded antennas – grounded antennas – grounding system- effect of antenna height – directional high frequency antenna- horn antenna- Loop antenna

COURSE OUTCOME Total Periods (55+5T): 60

On completion of this course, the students will be able to

- Explain the basic building blocks of communication systems
- Analyze the performance of amplitude modulation techniques.
- Demonstrate Balance Modulator.
- Compare Ungrounded and grounded antennas.

TEXT BOOKS:

1. K.D.Prasad, "Antenna and Wave Propagation", Sathyaprakesan, IIIrd Edition 2003. (Unit – I)
2. Dennis Roddy, John coolen, "Electronic Communication" Prentice Hall of India 4th Edition, 2007. (Unit II, III & IV)
3. Kennedy Davis, " Electronic Communication Systems"4th Edition TATA McGraw Hill,2002. (Unit – 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 Ed, 2008.

Prepared by **Approved by**

(Mr. V. Sidharthan) (Dr. G. Senthil kumar)

16ECC02 -PRACTICAL – III DIGITAL ELECTRONICS

Semester	**III**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70**

COURSE OBJECTIVE

- To understand the logical operation of various gates & theorems
- To develop various logical circuits
- To acquire knowledge on A/D and D/A converters.

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 & Decade Counter
11. Digital to Analog Converter
12. BCD To Seven Segment Display

COURSE OUTCOME

On completion of this course, the students will be able to

- Verify the logic gates &Demorgan's theorem.
- Convert the binary and gray code.
- Design adder and Subtractor circuits.
- Construct encoder and decoder circuit.

Prepared by

(Mr. M. Prasannakumar)

Approved by

(Dr. G. Senthil kumar)

16ECI01 - Open Elective – I MOBILE PHONES SERVICING

Semester	**III**
Credit	**3**
Paper Type	**Open Elective**
Max. Marks	**CIA -30 CE -70**

COURSE OBJECTIVE

- To become familiar with cellular technology.
- To understand the mobile phone architecture and components usages.
- To identify the mobile phone components faults.
- To handle various hardware and software repairing tools.

Unit I: Foundational Knowledge **9**

Introduction to Mobile Phones – What is communication – Development of GSM cellular technology – Digital Mobile Cellphone – Cellular Access technology - Mobile Phone structure – Form factor – Mobile Phone classification – Mobile Phone Features

Unit II: Mobile Phone Component Identification and Features **6**

Peripheral Inputs – Output component parts – Internal electronic components – Introduction to mobile phone hardware repairs – Market potential – Mobile phone hardware repair tools

Unit III: Hardware Technical Aspects **7**

Technical skill set – Mobile phone assembly – Mobile phone disassembly – How to use multimeter for measurement – Component Measurement values – How to test various components – Soldering

Unit IV: Mobile Phone Hardware Architecture **9**

Overview – Call process from cell to cell – Mobile phone motherboard component and layout – Electronic component, functions and usage – Description of discrete electronic components – Integrated circuits – Surface mount technology – Sensors and Transducers – Component failure analysis

Unit V: Hardware and Software Repair Technology **9**

Technical mindset – Common fault in mobile phone – How to repair various categories of faults – Software Repairs: Mobile phone Operating systems – Software Repair tool guide – Fault Diagnosis – Viruses – Software tool installation guide – System requirement for software flash repairs

COURSE OUTCOME **Total Periods (40+4T): 44**

On completion of this course, the students will be able to

- Apply the important concept and principle of Mobile Cellular technology.
- Identify the mobile phone hardware repair and the tools used to repair the problem.
- Describe the Mobile Phone disassembly and assembly process.
- Troubleshoot the Hardware and Software faults in the mobile phone.

TEXT BOOK:

1. Chukky Oparandu, "Mobile phone and tablet repairs: A complete guide for Beginners and Professionals", Mondarim Ltd, Nigeria, 1st Edition, 2016 (Unit I – V).

REFERENCE BOOK:

1. G Greenwood, "Smartphone troubleshooting and repair", American trained experts, 1st Edition.

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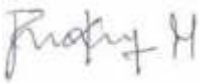

(Mr. M. Prasannakumar) (Dr. G. Senthil kumar)

16EC401 INSTRUMENTS AND MEASUREMENTS

Semester	**IV**
Credit	**2**
Paper Type	**Core**
Max. Marks	**CIA -15** **CE -35** **TOT =50**

Objective

- To understand how different types of meters, Transformers work and their applications
- To compare the various bridge measurement techniques.
- To make use of various electronic instruments, their construction, applications, principles of operation, standards and units of measurements
- To identify peculiar errors associated with the instruments and how to minimize such errors

UNIT - I: ELECTRONIC INSTRUMENTS **8**

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

UNIT -II: TRANSFORMERS **8**

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

UNIT -III: BRIDGE MEASUREMENT **9**

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 **7**

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 **8**

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

COURSE OUTCOME **Total Periods(40+4T): 44**

On completion of this course, the students will be able to

- Differentiate various meters and transformers and put them into practices.
- measure frequency, phase with Oscilloscope
- balance the bridges to find unknown values &Use AC and DC bridges for relevant parameter measurement
- Test and troubleshoot electronic circuits using various measuring instruments.
- use various laboratory instruments like cathode ray oscilloscope, voltmeter, dismantle and recouple serviceable parts of some other selected instruments without damaging them

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 .

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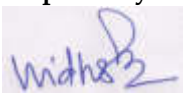

(Mr. V. Sidharthan) (Dr. G. Senthil kumar)

16EC402 ICs AND THEIR APPLICATIONS

Semester	**IV**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70**

Objective:

- To learn the basic building blocks of linear and nonlinear circuits.
- To understand the principle of operational amplifier and special function IC's.

UNIT – I: IC FABRICATION **11**

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 **11**

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 **13**

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 **12**

Introduction- Functional Block of IC 555 Timer- MonostableMultivibrator-Application: Frequency divider– AstableMultivibrator – Applications –FSK generator- -BistableMultivibrator

PLL- Basic Principles-Functional Block of IC 565 Phase Locked Loop and Schematic-Applications: Frequency Multiplier – FM Detector

UNIT – V: SPECIAL PURPOSE IC'S **13**

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

COURSE OUTCOME **Total Periods (55+5T): 60**

On completion of this course, the students will be able to

- Describe the characteristics of operational amplifiers.
- Develop and analyse operational amplifier application circuits.
- Demonstrate the applications of analog multipliers.
- Discuss the operation of Timer, PLL and its applications

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.

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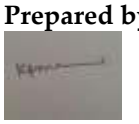

(Mrs. K. Poornima) (Dr. G. Senthil kumar)

16EC403 -PRACTICAL – V: ELECTRONIC COMMUNICATION

Semester	**IV**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

COURSE OBJECTIVE

- To experiment the AM, FM Modulation and Detection..
- To develop the practical knowledge on PWM , PPM
- To experiment the operations of communication system

Any 10 Experiments:

1. AM Modulation & Detection
2. FM Modulation using IC 555
3. FM detection using IC 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

COURSE OUTCOME

On completion of this course, the students will be able to

- Work on AM, FM Modulation and Detection.
- Develop the PWM, PPM practically.
- Experiment the operations of communication system.

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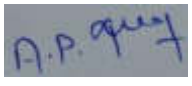

(Mr. A.P. Ramesh)

Approved by

(Dr. G. Senthil kumar)

16EC404 -PRACTICAL – VI INTEGRATED CIRCUITS

Semester	**IV**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

COURSE OBJECTIVE

- To introduce the basic building blocks of linear and Non-Linear circuits.
- To develop the special functions of 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. MonostableMultivibrator using IC 555
9. AstableMultivibrator using IC 555
10. Voltage controlled oscillator
11. Regulated Power Supply using IC 723 (low and high voltage)
12. Function Generator using IC 8038

COURSE OUTCOME

On completion of this course, the students will be able to

- Design an Op-Amp circuit
- Analyze the Op-Amp circuit and its parameter.
- Develop the multivibrator circuit.

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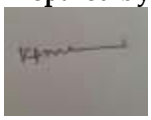


(Mrs. K. Poornima)

Approved by

(Dr. G. Senthil kumar)

16EC405 -ALLIED – IV: COMPUTER PROGRAMMING II: VISUAL BASIC PROGRAMMING

Semester	**IV**
Credit	**2**
Paper Type	**Allied**
Max. Marks	**CIA -15** **CE -35** **TOT =50**

Objective:

- Implement the event driven programming using VB 6.0 forms and controls
- Use programming fundamental features like variables, control structures, procedures, etc.
- Create menu to make the application more interactive
- Create your own class to implement some business logic in the application
- Create ActiveX components like DLL, OLE use them in client application
- Create Data centric applications by connecting to the databases

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

COURSE OUTCOME **Total Periods: 44**

On completion of this course, the students will be able to

- Explore Visual Basic's Integrated Development Environment (IDE).
- Implement syntax rules in Visual Basic programs.
- Explain variables and data types used in program development.
- Write and apply loop structures to perform repetitive tasks.
- Write and apply procedures, sub-procedures, and functions to create manageable code.
- Create one and two dimensional arrays for sorting, calculating, and displaying of data.
- Write Windows applications using forms, controls, and events.

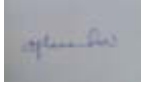
TEXT BOOK:

1. Michael Halvorson, "Microsoft Visual Basic 6.0 Professional Step by Step", Micro SoftPress 2008.

REFERENCE BOOK:

1. GaryComell, "Visual Basic 6 from the Ground up" TMH Publications, 5th Edition, 2011

Prepared by **Approved by**



(Mr. N. Mahendiran) (Dr. G. Senthil kumar)

16EC406 -ALLIED PRACTICAL – II: COMPUTER LAB – II: VISUAL BASIC PROGRAMMING

Semester	**IV**
Credit	**2**
Paper Type	**Allied**
Max. Marks	**CIA -15** **CE -35** **TOT =50**

Objective

- Implement the event driven programming using Visual Basic 6.0 forms and controls
- Use programming fundamental features like variables, control structures, procedures, etc.
- Create menu to make the application more interactive
- Create your own class to implement some business logic in the application
- Create ActiveX components like DLL, OLE use them in client application
- Create Data centric applications by connecting to the databases

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

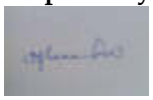
10. Develop a program to Insert, delete, update, Move First Record, Move next Record, Move previous Record, and Move last Record in Ms Access database using ADO

COURSE OUTCOME

On completion of this course, the students will be able to

- Understand the how calculations are done in visual basic
- Understand the various visual basic string operations
- Understand the various controls and its usages.
- Understand the data base connectivities.

Prepared by



(Mr. N. Mahendiran)

Approved by

(Dr. G. Senthil kumar)

16EC407 -SKILL BASED COURSE – 2: BIO MEDICAL INSTRUMENTATION

Semester	**IV**
Credit	**3**
Paper Type	**Skill Based**
Max. Marks	**CIA -30** **CE -70**

Objective

- To recognize the sensors and Transducers.
- To acquire the principle of operation and design of biomedical instruments.
- To analyse and measure the various bio signals like EEG, ECG, etc..
- To learn biomedical recorders instruments.
- To understand patient care and monitoring system

Unit – I: Sensors and Transducers 10

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 12

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 11

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 12

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 10

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

COURSE OUTCOME **Total Periods (55+5T): 60**

On completion of this course, the students will be able to

- Explain the principles of various biomedical devices and Sensors & detectors.
- Describe the principle operation and design and the background knowledge of biomedical instruments and specific applications of biomedical recording system
- Analysis and compare different instrument to measure bio signals like EEG, ECG, and EMG etc..
- Experiment the patient monitoring system.

TEXT BOOKS

1.Dr. Arumugam," Biomedical Instrumentation", Anuradha Publications 10th 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. Charlesbabu) (Dr. G. Senthil kumar)

16ECE03 ELECTIVE – I: MOBILE COMMUNICATION

Semester	**IV**
Credit	**4**
Paper Type	**Elective**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

Objective

- To make students familier with fundamentals of mobile communication system
- To identify the requirements of mobile communication as compared to static communication
- To identify the limitations of 2G and 2.5G communication and use design of 3G and beyond mobile communication systems
- To choose system (TDMA/FDMA/CDMA) according to the complexity, installation cost, speed of transmission, channel properties .

UNIT – I: INTRODUCTION TO MOBILE COMMUNICATION SYSTEMS 12

Evolution of Mobile radio communications – Mobile radio systems in the U.S. and around the world – Examples of Mobile radio systems.

UNIT – II: CELLULAR CONCEPT 12

Cellular concept – Frequency reuse – Channel Assignment strategies – Handoff strategies – Interference and System capacity – Trunking and Grade of service – Improving capacity in cellular systems.

UNIT – III: MOBILE RADIO PROPAGATION 12

Small-scale multipath propagation – Impulse response of a multipath channel – Parameters of mobile multipath channel – Types of small-scale fading – Rayleigh and Rician distributions – Statistical models for multipath fading channels.

UNIT – IV: GSM, GPRS, 3G STANDARDS 12

GSM services and features – GSM system architecture – GSM radio subsystem – Frame structure for GSM – Signal processing in GSM – GPRS network architecture – GPRS services and features – 3G UMTS network architecture – UMTS services and features.

UNIT V: MULTIPLE ACCESS TECHNIQUES 12

Multiple access techniques – FDMA, TDMA, TDMA/FDD, CDMA, SDMA and OFDMA/MIMO/SC-FDMA, MIMO/SOFDMA, OFDM/MIMO, HCSDMA/TDD/MIMO

COURSE OUTCOME Total Periods (50+5T): 55

On completion of this course, the students will be able to

- familiar with various generations of mobile communications understand the concept of cellular communication
- Knowledge of GSM mobile communication standard, its architecture, logical channels, advantages and limitations
- Knowledge of 3G mobile standards and their comparison with 2G technologies.
- Compare and classify the multiple access techniques.

TEXT BOOKS

1. Rappaport, T.S., "Wireless Communications, Principles and Practice", 2ndEdition, Prentice Hall,2009.
2. William Stallings, "Wireless Communications and Networks", 2ndEdition, Pearson Education, 2009.
3. Siegmund M. Redl, Mathias K. Weber, Malcolm W. Oliphant, "An Introduction to GSM", Artech House Publishers,1998

Prepared by **Approved by**

(Mr. V. Sathish kumar) (Dr. G. Senthil kumar)

16ECE01 ELECTIVE – I: ELECTRONIC DATA & AUDIO VIDEO COMMUNICATION

Semester	**IV**
Credit	**4**
Paper Type	**Elective**
Max. Marks	**CIA -30** **CE -70**

COURSE OBJECTIVES

- To learn the basic concept of data communication and their types
- To grab the knowledge of Pulse modulation techniques
- To acquaint with knowledge in structure of network communication
- To familiar with the major components of LAN network the network security concept

Unit I Pulse Communication **10**

Pulse Amplitude modulation – Pulse Code modulation- DPCM- Delta modulation- PFM-PTM-PPM

Unit II Data and Signals, Transmission Media , Network Topologies and Switching **12**

Analog and Digital – Periodic Analog signals – Digital signals- Transmission Impairment - Data rate Limits- -Performance- Guided Media – Unguided Media — performance - Network Topologies – Mesh- Star –Tree- Ring – Bus- Switching- Basics- Circuit Switching – Packet Switching - Message Switching.

UNIT III Networking Protocols and OSI Model **13**

Introduction- Protocol in computer communication- OSI Reference Model – Physical Layer – Data Layer – Network Layer – Transport Session and application layer- OSI Layer function

UNIT IV Elements of a Television system **13**

Introduction to television – Picture Transmission – Sound Transmission & Reception – Synchronization – Gross structure – Flicker – Fine structure- Composite video signal – Vestigial side band transmission and reception **-** 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 - Sync separator- EHT generation.

UNIT V Digital Televisions **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

COURSE OUTCOME **Total Periods (50+5T): 55**

On completion of this course, the students will be able to

- Analyze the knowledge of the data communication and their types
- design pulse modulation and the its various types
- Analyze the major components of LAN network the network security concept
- Analyze Performance of spread spectrum communication system

TEXT BOOKS:

1. Dennis Roddy, John coolen, "Electronic Communication" Prentice Hall of India 4th Edition, 2007. (Unit I)
2. Achyut S Godbole, "Data Communications and Networks", Tata McGraw Hill, 4th Ed,2008. (II & III)
3. R.R.GULATI, "Modern Television Practice", Principles, technology and Servicing Fourth Edition, New Age International Publishers 2012(Unit IV)
4. R.G.GUPTA, "Audio and videos system: Principles, Maintenance and Troubleshooting" 2nd Ed TATA McGraw Hill Publishers 2010 (Unit V)

REFERENCE BOOK:

1. R.G.GUPTA, "Electronic Instruments and Systems, Principles, Maintenance and Troubleshooting", TATA McGraw Hill 2005
2. Behrouz A. Forouzan, " Data Communication and Networking", Tata McGraw Hill, 4th Edition,2011

Prepared by **Approved by**

(Mr. V. Sathish kumar) (Dr. G. Senthil kumar)

16ECE02 ELECTIVE – I: MATERIAL SCIENCE

Semester	**IV**
Credit	**4**
Paper Type	**Elective**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

Objective

- To acquire the knowledge on semiconductor, magnetic and optical materials.
- To Understand structure- properties, relationship of materials science
- To grasp the fundamentals of modern engineering materials.
- To differentiate classes of materials, their properties & structures

UNIT I: CONDUCTING MATERIALS 12

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 11

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

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 clausiusmosotti equation – dielectric loss – different types of dielectric breakdown – classification of insulating materials and their applications

UNIT - IV: OPTICAL MATERIALS 12

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 12

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

COURSE OUTCOME **Total Periods (50+5T): 55**

On completion of this course, the students will be able to

- Analyze semiconductor, magnetic and optical materials
- Describe the principles, bonding scheme and its general physical properties & applications.
- apply engineering principles of modern engineering materials
- inspect the advanced materials and their applications, such as electronic materials, optical materials and magnetic materials

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

Prepared by **Approved by**

(Mr. V. Sathish kumar) (Dr. G. Senthil kumar)

PERSONALITY, APTITUDE AND CAREER ENHANCEMENT
PACE – V

Course Objectives

- To recap concepts learnt in PACE 3 & 4 and introduce adequate soft skills required for the business environment to the students.
- To introduce concepts on Creativity and Time Utilization Management.
- To give extensive exercises on Quantitative Aptitude, Reasoning Aptitude & Verbal Aptitude, by inculcating all the company-specific papers those are required to participate effectively in the Placement Process.
- To introduce higher level concepts on Personal Effectiveness Skills and Resume Building.
- To reiterate the importance of Impression Management and its effectiveness

Unit - I: Quantitative Ability – Company Specific

Number System – Divisibility rules, Unit digit, BODMAS, HCF and LCM. Averages AP and GP – Percentage – Increase and decrease concepts. Profit and Loss – Interest Calculation – Simple interest and Compound interest. Time Speed Distance – Problems on Trains, Boats and Stream, races. Time and Work – Pipes and cistern. Permutation and Combination – Probability – Ratio Proportion, Problems on ages. Mixtures and Solutions – Alligation.

Unit - II: Reasoning Ability – Company Specific

Data Arrangements – Linear and Circular arrangement. Data Interpretation – Alpha and Numeric series – Odd man out. Coding and Decoding. Venn diagram – Set language properties – Syllogism – Data Sufficiency – Applications of quantitative ability concept. Clocks and Calendars.

Unit - III: Verbal Ability – Company Specific

Vocabulary – Etymology, Root words, verbal analogy. Reading – Reading Comprehension, Jumbled Paragraphs and Jumbled Essays. Application of Grammar concepts – Sentence Construction, Sentence Improvisation. Critical Reasoning – Statement/Argument – Premises, Inference, Conclusion, Strengthening and Weakening of arguments.

Unit - IV: Group Discussion Skills

Lateral Thinking – Out of Box thinking, Creative Problem-solving, Practical Application. Anger Management – Causes of Anger, Channelizing Anger, Effective Anger management – Stress Management – Causes of Stress, Importance of Eustress, Steps to effective Stress Management. Quizzes related to current affairs.

Unit - V: Interview Skills

Impression Management – Psychology behind Professionalism, Powerful impressions. Handling Common Questions in Interviews. Ethics and Integrity vs Psychometric test. Time Utilization Management – Methods and Strategies. Reviews – Resume Building, Goal-setting and Personality.

Course Outcomes

On the successful completion of PACE 5, the students would be able to

- Utilize time, being creative and have more insight on business environment.
- Equip themselves adequate skill-set that are required to participate effectively in the Placement Process.
- Develop Personal Effectiveness Skills and Resume Building.
- Make use of impression management in-terms of participating effectively in interviews.

References

1. Developing Communication Skills by Krishna Mohan & Meera Banerji
2. Verbal Ability and Reading Comprehension by Arun sharma
3. Word Power Made Easy by Norman Lewis
4. High School English Grammar by Wren and Martin
5. Art of Social Media by Guy Kawasaki
6. A Modern Approach to Verbal and Nonverbal Reasoning by Dr. R. S. Aggarwal
7. A Modern A Modern Approach to Verbal by Dr. R. S. Aggarwal
8. A Modern Approach to Nonverbal Reasoning by Dr. R. S. Aggarwal
9. A Practical Course in Spoken English by J.K.Gangal
10. Effective English Communication for you by V.Shamala

16EC501-MODERN COMMUNICATION SYSTEM

Semester	**V**
Credit	**2**
Paper Type	**Core**
Max. Marks	**CIA -15** **CE -35** **TOTAL - 50**

COURSE OBJECTIVE

- To Analyze the error performance of digital modulation techniques
- To make the students understand the basic concept in the field of Satellite Communication and to know how to place a satellite in an orbit
- To expose the students to the basics of signal propagation through optical fibers

Unit-I Pulse Communication **06**

Introduction - Sampling theorem, Nyquist rate, aliasing, natural & flat top sampling. - PAM, PWM, PPM - Pulse code modulation - Delta modulation – DPCM

Unit – II: Digital Modulation Techniques **0 5**

ASK – FSK – PSK – DPSK– QPSK.

Unit – III Microwave communication system **06**

Introduction – Microwave Region and Band Designations-Advantages of Microwaves – Applications of Microwaves–Maxwell's equation – Wave Equation – Types of Wave guide.

Unit – IV: Satellite communication system **06**

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 **07**

Introduction to optical fibers – 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.

COURSE OUTCOME **Total Periods: 30**

On completion of this course, the students will be able to

- Explain the Different types of Pulse communication systems
- Analyze the performance of Digital modulation techniques.
- Derive the expression of Wave guide equation
- Demonstrate the Satellite communication system.
- Classify the Optical sources and detectors and to discuss their principle.

TEXT BOOKS:

1. Anokh Singh, "Principles of communication Engineering "S.Chand & Company Ltd. Seventh Edition 2013 (Unit I & II)

2. M.Kulkarni, "Microwave and Radar Engineering", Umesh Publications, 5th Edition, 2014 (Unit III)

3. Robert 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.

3. Behrouz A Forouzan "Data Communication and Networking "Tata McGraw Hill , Special Edition , 2006.

Prepared by

(Mr. M. Thamarai selvan)

Approved by

(Dr. G. Senthil kumar)

16EC502 8051 MICROCONTROLLER

COURSE OBJECTIVE

- Give an understanding about the concepts and basic architecture of 8051.
- Impart knowledge about instruction set, addressing modes and assembly language programs of 8051.
- Help understand the importance of different peripheral devices & their interfacing to 8051.
- Impart knowledge of different types of external interfaces including LEDS, LCD, Keypad Matrix, Switches & Seven segment display.

Semester	**V**
Credit	**5**
Paper type	**core**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

UNIT I: 8051 Architecture **14**

Introduction to Microcontroller – Microcontroller Vs Microprocessor- 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 – Example Programs.

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: PERIPHERALS AND INTERRUPTS **14**

Timer and Counters: Timer modes of operation – Counters – Serial Communication – Data Transmission and Reception – Interrupt – Interrupt control – Interrupt Priority – Interrupt Destination.

UNIT V: 8255 & REAL TIME APPLICATIONS **11**

8255 Programmable I/O Port – Functional Description – Programming the 8255- Keyboard interface – Lead per key keyboard – Matrix Keyboard – Seven Segment Display – D/A Interface – A/D Interface.

COURSE OUTCOME **Total Periods: 66**

On completion of this course, the students will be able to

- Gain Comprehensive knowledge about architecture and addressing modes of 8051.
- Develop Assembly language program using instructions for applications.
- Create I/O Interfacing techniques with 8051 Microcontroller.
- Configure Peripherals and prioritize the interrupts.
- Design and develop program for real time applications.

TEXT BOOKS

1. Kenneth J. Ayala, "The 8051 Microcontroller Architecture, Programming and Application", Penram International Publications, Fourth Edition 2009(Unit I– II , IV - V)
2. Muhammad Ali Mazidi, Janice Gfillispie Mazidi, "The 8051 Microcontroller and Embedded Systems", Pearson Education, LPE 10th reprint 2012 (Unit III)

REFERENCE BOOKS

1. Raj Kamal, "Microcontrollers" Architecture, Programming, Interfacing and System Design", Pearson Education, Second Edition 2011.

Prepared by

[Ms. S. Indira]

Approved by

[Dr. G. Senthil Kumar]

16EC503- PRACTICAL – VII: INDUSTRIAL AND POWER ELECTRONICS

Semester	**V**
Credit	**4**
Paper type	**core**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

COURSE OBJECTIVES

- To make the students to design triggering circuits of SCR.
- To understand the characteristics of power electronic devices.

Any10Experiments:

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

COURSE OUTCOME **Total Periods: 48**

On completion of this course, the students will be able to

- Analyze the characteristics of SCR, firing circuits and commutation techniques.
- Design and construct power electronic circuits.

Prepared by

(Dr.K.Poornima)

Approved by

(Dr. G. Senthil kumar)

16EC504 PRACTICAL VIII: 8051 MICROCONTROLLER

Semester	**V**
Credit	**4**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

COURSE OBJECTIVES

- This course introduces the assembly language programming of 8051 microcontroller.
- It develops the student's Assembly language programming skills and gives practical training of interfacing the peripheral devices with the Microcontroller.

ANY TEN EXPERIMENTS: (Using Assembly Language / Simulation using Proteus)

1. Addition and Subtraction of 8/16 Bit data.
2. Multiplication and Division of 8 bit data.
3. 1's and 2's Complement of 8/16 bit data.
4. Largest and Smallest number in an array.
5. Ascending and descending order of an array.
6. Block data transfer and Exchange.
7. Parallel Port Interface.
8. Rolling /Flashing Display
9. Stepper Motor Interface.
10. Waveform Generator.
11. D/A Interface.
12. Speed Control of DC Motor.

COURSE OUTCOME **Total Periods: 48**

On completion of this course, the students will be able to

- Apply the fundamentals of assembly level programming of microcontroller.
- Design and Develop program for real time interfaces.
- Troubleshoot interactions between software and hardware.

Prepared by **Approved by**

[Ms. S. Indira] **[Dr. G. Senthil Kumar]**

16EC505-PRACTICAL –IX: BIO MEDICAL INSTRUMENTATION

Semester	**V**
Credit	**4**
Paper Type	**Core**
Max. Marks	**CIA -30** **CE -70**

COURSE OBJECTIVE

- To understand basic principles and phenomena in the area of medical diagnostic instrumentation and sensor operations.
- To acquire the knowledge of bio potential electrodes.
- To learn the operation of pacemaker and defibrillators circuits.
- To understanding the basic principles of ECG interpretation.

Any 10 Experiments:

1. Pressure measurement
2. Weight measurements using Load cell
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. Defibrillators

Total Periods: 48

COURSE OUTCOME

On completion of this course, the students will be able to

- Design the pacemaker and defibrillator circuits.
- Design the temperature measurement circuit using thermistor
- Analyze the pressure measurement of human being

Prepared by

(J.Charlesbabu)

Approved by

(Dr.G.Senthil kumar)

16EC506 – Skill Based Course -3 INDUSTRIAL AND POWER ELECTRONICS

Semester	**V**
Credit	**3**
Paper type	**Skill Based**
Max. Marks	**CIA -30** **CE -70** **TOT =100**

Objective:

- To enable the students to learn the industrial and power electronics with applications.
- To analyse different switching devices control with their applications.

Unit – I: Semiconductor Power Device **07**

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 **09**

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 **10**

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 **08**

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 P o w e r Supply – SMPS.

Unit – V: Industrial Applications and Timers **10**

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.

Course Outcome **Total Periods: 44**

On Completion of this course, the students will be able to

- Articulate the basics of power electronic devices.
- Implement the commutation methods.
- Design AC Voltage Controller, chopper and Inverter circuits.
- Design of power electronic converters and timing circuits.

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

(Dr.K.Poornima)

Approved by

(Dr. G. Senthil kumar)

16ECI01 - Open Elective – I MOBILE PHONE SERVICING

Semester	**V**
Credit	**3**
Paper Type	**Open Elective**
Max. Marks	**CIA -30 CE -70**

COURSE OBJECTIVE

- To become familiar with cellular technology.
- To understand the mobile phone architecture and components usages.
- To identify the mobile phone components faults.
- To handle various hardware and software repairing tools.

Unit I: Introduction to Mobile Communication Technology **9**

Introduction to Mobile Phones – What is communication – Development of GSM cellular technology – Digital Mobile Cellphone – Cellular Access technology - Mobile Phone structure – Form factor – Mobile Phone classification – Mobile Phone Features

Unit II: Mobile Phone Component Identification and Features **9**

Peripheral Inputs and Output component parts – Internal electronic components – Introduction to mobile phone hardware repairs – Market potential – Mobile phone hardware repair tools

Unit III: Hardware Technical Aspects **9**

Technical skill set – Mobile phone assembly – Mobile phone disassembly – How to use multimeter for measurement – Component Measurement values – How to test various components.

Unit IV: Mobile Phone systems **9**

Overview – How does a cell phone works – Call process from cell to cell – Battery charging system – Audio system – SIM card circuits – Touch screen system – Keypad systems.

Unit V: Faults and Repair procedures in Mobile Phone **8**

Technical mindset – Common fault in mobile phone – How to repair various categories of faults (Power on failure, Charging, speaker, microphone, keypad, switch, touch screen), Flash.

COURSE OUTCOME **Total Periods: 44**

On completion of this course, the students will be able to

- Apply the important concept and principle of Mobile Cellular technology.
- Identify the mobile phone hardware repair and the tools used to repair the problem.
- Describe the Mobile Phone disassembly and assembly process.
- Analyze the working of various Mobile phone systems
- Troubleshoot the Hardware and Software faults in the mobile phone.

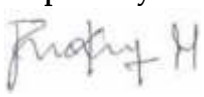
TEXT BOOK:

1. Chukky Oparandu, "Mobile phone and tablet repairs: A complete guide for Beginners and Professionals", Mondarim Ltd, Nigeria, 1st Edition, 2016 (Unit I – V).

REFERENCE BOOK:

1. G Greenwood, "Smartphone troubleshooting and repair", American trained experts, 1st Edition.

Prepared by **Approved by**



(Mr. M. Prasannakumar) (Dr. G. Senthil kumar)

16EC601: VLSI SYSTEM DESIGN AND VHDL PROGRAMMING

Semester	VI
Credit	5
Paper type	Core
Max. Marks	CIA -30 CE -70

COURSE OBJECTIVE

- To inculcate the knowledge of various architectural design.
- To impart knowledge on various operators.
- To learn how to program the digital hardware models.
- To develop various hardware models using VHDL programming.

Unit – I: Design units: 14

Introduction to VLSI system design -- 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: 14

Identifiers: - Basic Identifier -- Extended Identifier - Data objects:- Classes - Constants- Variable – Signal – File. Data types:- Scalar – Composite – Access- File and their declarations

Unit – III: Operators: 12

Logical operators -- Relational operators -- Shift operators -- Adding operators -- Multiplying operators -- Miscellaneous operator

Unit – IV: Programming model 13

Process statement -- Variable assignment statement -- Signal assignment statement -- If statement -- Case statement -- Loop statement

Unit – V: Hardware modeling representation 13

Adder – Subtractor – Encoder – Decoders – Multiplier -- Shift register – Counter -- ALU design

COURSE OUTCOME

Total Periods: 66

On **completion of this course, the students will be able to**

- Differentiate various architecture modeling.
- Design Digital circuits using Basic Identifier, Extended Identifier and Data objects.
- List out various operators in modeling the design units.
- Apply the concept of signal and variable assignment statement in programming various design units.
- Design and develop various hardware models using the programming knowledge.

TEXT BOOK:

1. J. Bhasker, "VHDL Primer" III Edition, Pearson India, Edition 2015 (Unit I to V)

REFERENCE BOOKS:

1. Dougles L. Perry, "VHDL", IV Edition, Tata McGraw Hill, 2002.

Prepared by (Mr. M. Prasannakumar)

Approved by (Dr. G. Senthil Kumar)

16EC602 -PRACTICAL X: VHDL PROGRAMMING

Semester	VI
Credit	4
Paper type	Core
Max. Marks	CIA -30 CE -70

COURSE OBJECTIVES

- To acquire knowledge on VHDL Programming.
- To understand the concept of designing various circuits.
- It will develop the thinking ability of the students to design and program various digital system units.

ANY TEN EXPERIMENTS

To design using VHDL Programming

1. Verification of various Logic gates.
2. Half adder circuit.
3. Full adder circuit.
4. Half Subtractor circuit.
5. Full Subtractor circuit.
6. Encoder circuit.
7. Decoder circuit.
8. Multiplexer circuit.
9. De-Multiplexer circuit.
10. Design of Simple ALU circuit.
11. D – Flipflop circuit.
12. Ring counter circuit.

COURSE OUTCOME

Total Periods: 48

On **completion of this course, the students will be able to**

- Apply the programming knowledge in designing various digital systems.
- Design and develop various sequential digital circuits.
- Troubleshoot and rectify the errors in the design.
- Write test codes and check the output of the design for the accuracy.

Prepared by

(Mr. M. Prasannakumar)

Approved by

(Dr. G. Senthil kumar)

16EC603 -PRACTICAL – XI: MODERN COMMUNICATION

Semester	VI
Credit	4
Paper Type	Core
Max. Marks	CIA -30 CE -70

COURSE OBJECTIVE

- To experiment the Digital Modulation and Detection.
- To develop the practical knowledge on Shift Keying Techniques.
- To experiment the operations of Fiber Optic communication system

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. Measure the Optical Power Emitted by LED
9. Calculate the Power rating of Photo diode
10. Establish of 850nm Digital Link of Fiber
11. Bending Loss of optical fiber
12. Measurement of Numerical Aperture of the Fiber

Total Periods: 48

COURSE OUTCOME

On **completion of this course, the students will be able to**

- Design the digital modulation and Detection circuits.
- Demonstrate the various Shift keying Techniques.
- Estimate the efficiency of Fiber optic system.

Prepared by

(Mr. M. Thamarai selvan)

Approved by

(Dr. G. Senthil Kumar)

16EC604- SKILL BASED COURSE - 4: WIRELESS AND NETWORK COMMUNICATION

Semester	VI
Credit	3
Paper type	Skill Based
Max. Marks	CIA -30 CE -70 TOT =100

COURSE OBJECTIVE

- To inculcate the principle of wireless communication system.
- To impart knowledge on the usage of cellular network.
- To learn how to access the network.
- To understand about 2G, 3G & 4 G networks.

UNIT –I Introduction to Wireless Communication System 9

Introduction – Examples of wireless communication system: Paging System – Cordless Telephone Systems – Cellular Telephone Systems – Comparison of Common Wireless Communication System.

UNIT –II Cellular Concepts 9

Introduction – Frequency Reuse – Channel Assignment – Handoff Strategies: Prioritizing Handoff – Practical Handoff – Coverage & Capacity: Cell splitting – Sectoring – Repeaters.

UNIT –III Communication Networks 8

LAN – MAN – WAN – Switching Techniques – Circuit switching – Packet switching – Asynchronous transfer mode.

UNIT –IV Accessing Techniques 9

Introduction – Multiple access – FDMA – TDMA – CDMA – Packet Radio: Pure ALOHA – Slotted ALOHA – Capacity of cellular system.

UNIT –V 2G & 3G wireless Networks 9

Second generation (2G) wireless networks – Evolution for 2.5G TDMA Standards – HSCSD-GPRS-EDGE-IS-95B –Third generation wireless networks – 3G CDMA 2000- 3G CDMA – Introduction to 4G.

COURSE OUTCOME

Total Periods: 44

On **completion of this course, the students will be able to**

- Compare various wireless communication systems.
- Describe the concepts of cellular systems.
- Analyze the switches used for the communication network.
- Define and distinguish FDMA, CDMA and TDMA.
- Differentiate 2G, 3G & 4G wireless networks.

TEXT BOOK:

1. Theodore S. Rappaport "Wireless Communication Principles and Practice "PHI second Editions 2008, Unit (I, II, IV, V).

2. William Stallings "Wireless communications & Networks" Pearson-low price Edition- Second Editions 2008, Unit (IV).

REFERENCE BOOKS:

1. Jon W.Mark, Weihua Zhuang "Wireless Communications and Networking" PHI –First Edition 2007.

Prepared by

(Mr. M. Prasannakumar)

Approved by

(Dr. G. Senthil Kumar)

16EC605 - Project and Viva voce

COURSE OBJECTIVES

- To understand and gain the knowledge of engineering practices so has to participate and produce engineering project in future.
- To create research and development knowledge for Under Graduate students using electronics components and devices along with different types of application software related to electronics field.
- To impart knowledge on electronics and implement in the working world.

Semester	VI
Credit	3
Paper Type	Mini Project
Max. Marks	CIA -80 CE -20 Total - 100

GUIDELINE TO STUDENTS

The **students should strictly adhere to the following points**

- Students are expected to undergo project work individually and should submit individual reports.
- Students can do project in Industry or in our Lab.
- Publication of paper in journal/ Presentation of paper in Conference are highly appreciable.

Tentative **Dates regarding Review Meeting**

I Meeting : Confirmation of Project Title on or before 27/12/2018

II Meeting : Block Diagram Description on or before 17/01/2019

III Meeting : Circuit Diagram Description on before 14/02/2019

IV Meeting : Project Demo and Rough report submission on before 21/03/2019

Rough Documentation of the Project, submitted to the respective guides get corrected and modifications any should be done. Final Submission of the bounded project as per specifications 28/03/2019.

Note: **For each Meeting, internal marks will be awarded based on their Performance and Quality** of Work.

Course **Outcomes**

On **completion of this project, the students will be able to**

- Apply learned methodologies and techniques to solve the problems.
- Design and develop hardware circuits.
- Test and debug the developed project.

Prepared by

(Mr. M. Prasannakumar)

Approved by

(Dr. G. Senthil kumar)

16ECE04-ELECTIVE – II: ELECTRONIC DESIGN AND AUTOMATION

Semester	VI
Credit	4
Paper Type	Elective
Max. Marks	CIA -30 CE -70

COURSE OBJECTIVE

- To enable the students to learn about PCB design and fabrication techniques
- To give an exposure to basic concepts of OrCAD& PSPICE
- To make the students to design and simulate circuits using OrCAD& PSPICE

UNIT – I: BOARD TYPES & LAYOUT 10

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-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.

UNIT – II: LAMINATES CLEANING, PHOTO PRINTING & ETCHING 11

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-Etching: Introduction – Etching Machine – Etching system

UNIT –III: INTRODUCTION TO ORCAD 12

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.

UNIT – IV: INTRODUCTION TO PSPICE-I 10

PSPICE Platform- PSpice A/D- Circuit Description- Introduction-Input files- Element values-Nodes – Circuit elements- sources- types of analysis- output variables- PSpice output commands- format of circuit files- format of output files- DC circuit analysis.

UNIT – V: INTRODUCTION TO PSPICE ANALYSIS 12

DC Circuit Analysis- AC Circuit Analysis- Transient Analysis

COURSE OUTCOME **Total Periods** : 55

On completion of this course, the students will be able to

- Classify the boards and layers
- Design layout and make use of the Photo printing and etching techniques.
- Draw schematic using Orcad
- Design and simulate using PSpice.

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 I&II)
3. Shibu K V "Introduction to Embedded Systems" TATA McGraw Hill Publication Co. Ltd, Delhi -2010 (Unit III)
3. Muhammed H.Rashid "Introduction to PSpice Using OrCAD for circuits and Electronics" PHI,3rd Edition 2013.(Unit IV&V)

Prepared by **Approved by**

(Mr.Sathishkumar V) (Dr. G Senthil kumar)

16ECE05 – Elective II : EMBEDDED SYSTEMS

Semester	VI
Credit	4
Paper Type	Elective
Max. Marks	CIA:30 CE:70

COURSE OBJECTIVES

- To understand the general architecture of PIC microcontroller and its applications.
- To impart knowledge on different communication protocols used in embedded systems.
- To learn the fundamental differences between OS and RTOS and its functions.

UNIT - I PIC CPU ARCHITECTURE AND INSTRUCTION SET 11

Device Overview – Harvard Architecture – Pipe lining – Block Diagram – Memory Organization – Special function registers – I/O ports – Timers: Timer 0, Timer 1 and Timer 2 module – Instruction set – Simple Operation – Addressing modes.

UNIT - II PICSPECIAL FEATURES 10

Comparator module – Parallel slave port- Special features of the CPU: Configuration bits – Oscillator configuration- Reset- Interrupts- Watchdog timer- ICSP.

UNIT - III PIC PERIPHERALS 11

CCP Module –SSP Module: SPI mode and I^2C mode– USART- A/D Converters.

UNIT - IV EMBEDDED SOFTWARE ARCHITECTURE 11

Round Robin – Round Robin with Interrupts – Function Queue Scheduling Architecture – Real Time Operating Systems (RTOS) – Introductions to RTOS – Tasks and Data – Semaphores and Shared data- Message Queues, Mail box and Pipes .

UNIT - V RTOS BASED EMBEDDED SYSTEM DESIGN 12

RTOS Basics – Types of RTOS – Tasks, Process and threads- multiprocessing & multi-tasking – Task Scheduling – Task communication — Choosing a RTOS- VxWorks- µCOS II.

COURSE OUTCOME **Total Periods: 55**

On completion of this course, the students will be able to

- Describe the internal architecture of PIC16F877A and to write the programs in high level language.
- Identify and understand the function of different peripherals of PIC microcontroller.
- Interface LCD, Keyboard, ADC, DAC, Sensors, Relays, DC motor with PIC16 microcontroller.
- Characterize real-time systems and describe their functions.
- Analyze, design and implement a real-time system.

TEXT BOOKS

1. PIC 16f877A Data Sheet, 2014 (Unit I - III)
2. David E. Simon, "An Embedded Software Primer", PHI, 12th Edition, 2011 (Unit IV)
3. Shibu KV "Introduction to Embedded system" Tata McGraw Hill 2010 (Unit V)
4. Micro COS II reference manual, Salvo User manual & VX works Programmers manual. 2014 (Unit V)
5. Keil Real Time library documentation, 2014

REFERENCE BOOK

1. John .B. Peatmen, "Design with PIC Microcontroller", PHI, 5th Edition, 2012

Prepared by

[Ms. S. Indira]

Approved by

[Dr. G. Senthil Kumar]

16ECE06 – Elective II : TELECOMMUNICATION SWITCHING AND NETWORKS

Semester	VI
Credit	4
Paper Type	Elective
Max. Marks	CIA -30 CE -70

COURSE OBJECTIVE

- To enable the students to learn about Telecommunication switches.
- To give an exposure to basic concepts of ISDN, Telex, Switches.

Unit I: Fundamental of Telecommunications 11

Introduction – The increase in Telecommunication capacity- EFT-Automated Teller Machines- Telecommunication standards- Structure of Telecommunication network.

Unit II: Electronic Mail and Document 11

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 11

ISDN Broadband Network – Switching and Transmission- Broadband ISDN- Channel Types- Implementation plans- Broadband services.

Unit V : AT& T 5ESS Central Office Switch 11

Modular Design –Switching Module- Communications module –Administrative Module5ESS Network Configuration.

Total Periods: 55

COURSE OUTCOME

On completion of this course, the students will be able to

- Define telecommunication standards.
- Describe Electronic mailing concepts.
- Analyze Switching and transmission network.

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

(Mr.Sathishkumar V)

Approved by

(Dr. G Senthil kumar)