Approved in IV Academic Council Meeting Held on25.05.2019

E.G.S. PILLAY ENGINEERING COLLEGE(Autonomous)

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai |

Accredited by NAAC with 'A'Grade |Accredited by NBA (CIVIL, CSE, ECE, EEE, IT, MECH)

NAGAPATTINAM – 611 002

B.E ELECTRONICS AND COMMUNICATION ENGINEERING

Full Time Curriculum And Syllabus

Second Year – Fourth Semester

Course Code	Course Name	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1901MA402	Probability Theory and StochasticProcesses	3	0	0	3	40	60	100
1902EC401	Electronics Circuits	3	0	0	3	40	60	100
1902EC402	Signals and Systems	2	1	0	3	40	60	100
1902EC403	Electromagnetic Fields	3	0	0	3	40	60	100
1902EC404	Analog Integrated Circuits	3	0	0	3	40	60	100
1902EC405	Microprocessors and Microcontrollers	3	0	0	3	40	60	100
Laboratory Course								
1902EC451	Electronics and Integrated Circuits Laboratory	0	0	2	1	50	50	100
1902EC452	Microprocessors and Microcontrollers Laboratory	0	0	2	1	50	50	100
1904GE451	Life Skills: Reasoning	2	0	0	1	100	-	100
Total		**19**	**1**	**4**	**21**	**540**	**460**	**1000**
Audit Course								
1901MCX01	Environmental Science	0	0	0	0	100	-	100

L–Lecture|T–Tutorial|P–Practical|C–Credit|CA –ContinuousAssessment| ES–EndSemester

1901MA402	PROBABILITY THEORY AND STOCHASTIC PROCESSES	L	T	P	C
		3	1	0	4

PREREQUISITE :

1. Advanced and multivariate differential calculus and integral calculus.
2. Linear algebra and matrices

COURSE OBJECTIVES:

1. To analyze the concepts of probability, random variables and distribution functions.
2. To acquire skill in handling situation with more than one random variable with time function.
3. To analyze the concept of signals and system.

Module 1 PROBABILITY THEORY 9+3Hours

Sets and set operations; Probability, Conditional probability and Bayes theorem; Discrete and continuous random variables – Moments – Moment generating functions –Real Time Problems.

Module 1I DISCRETE AND CONTINUOUS RANDOM VARIABLES 9+3 Hours

Discrete Distributions: Binomial, Poisson, Geometric - Continuous Distributions: Uniform, Exponential, Normal distributions- Application of Distribution in Engineering Problems

Module III TWO - DIMENSIONAL RANDOM VARIABLES 9+3 Hours

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and Linear regression

Module IV STOCHASTIC PROCESSES 9+3 Hours

Stationary process – Markov process – Markov chains – transition probabilities – Limiting distributions – Poisson process. Stochastic processes,Stochaststically larger-preposition,coupling-stochastic monotonicity properties of birth and death processes-exponential convergence in markov chains.

Module V RANDOM PROCESSES 9+3 Hours

Auto correlation-cross correlation-power spectral density-cross spectral density-Properties-Wiener-Khintchine relation- Linear time invariant system- system transfer function-Linear system with random inputs-White noise.

TOTAL: 60 HOURS

FURTHER READING / CONTENT BEYOND SYLLABUS / SEMINAR :

COURSE OUTCOMES:

After completion of the course, Student will be able to

CO1 To apply probability techniques to analyze the performance of Electronic systems.(K3)
CO2 To apply standard distributions in describing real life phenomena.(K3)
CO3 To solve problems involving two dimensional random variable.(K3)
CO4 Make use of theorems related to random signals(K3)
CO5 To understand propagation of random signals in linear time invariant systems.(K2)

REFERENCES:

1. H. Stark and J. Woods, ``Probability and Random Processes with Applications to Signal Processing," Third Edition, Pearson Education
2. A.Papoulis and S. Unnikrishnan Pillai, ``Probability, Random Variables and Stochastic Processes," Fourth Edition, McGraw Hill.
3. K. L. Chung, Introduction to Probability Theory with Stochastic Processes, Springer International
4. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability, UBS Publishers,
5. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Stochastic Processes, UBS Publishers
6. S. Ross, Introduction to Stochastic Models, Harcourt Asia, Academic Press.
7. www.indiastudychannel.com

	ELECTRONIC CIRCUITS	L	T	P	C
1902EC401		3	0	0	3

Course Objectives:

1. To learn the fundamental concepts behind transistor biasing and to differentiate small signal and large signal circuit models
2. To study the performance metrics of Tuned amplifiers, Power amplifiers and oscillators.
3. To discuss various applications of analog circuits

Unit I ANALYSIS OF MOSFET 9 Hours

Biasing,Large and Small signal analysis CS, CG and source follower, miller effect, frequency response of CS, CG and source follower, Current Sources, Current Mirrors

Unit II DIFFERENTIAL AMPLIFIERS AND FEEDBACK AMPLIFIERS 9 Hours

Differential Amplifiers, CMRR, Differential amplifiers with active load, Two stage amplifiers,Feedback amplifiers - Current Series, Voltage Shunt, Current shunt and Voltage Series

Unit III TUNED AMPLIFIERS AND POWER AMPLIFIERS 9 Hours

Small signal tuned amplifiers – Analysis of capacitor coupled single tuned amplifier – double tuned amplifier – Stagger tuned amplifiers.

Power amplifiers- class A, class B, class AB, Biasing circuits, class C and class D

Unit IV OSCILLATORS 9 Hours

Sinusoidal oscillators, General form of oscillator circuit (Hartley & Colpitts), Barkhausen Criterion, Design and analysis of RC phase shift oscillator, Wien bridge oscillators, Resonant circuit oscillators, Crystal oscillator.

Unit V APPLICATIONS OF ANALOG ELECTRONICS 9 Hours

Selection of Components and Circuit Elements in an Application - Automatic Switch on of Lamp in the Dark/Presence of Light – Humidity and Smoke Detection - Future Advances – Case study: Revival in the Music Industry.

Total: 45 Hours

Further Reading:

Role of analog circuits in biomedical applications

Analog electronics applications in nanotechnology fields

Course Outcomes:

After completion of the course, Student will be able to

1. Determine various parameters of transistor amplifier circuits using signal analysis
2. Examine about differential amplifiers.
3. Design power amplifiers and tuned amplifiers
4. Design different types of oscillators.
5. Discuss the various applications of analog circuits

References:

1. A. Sedra and K. Smith, Microelectronic Circuits, 7th edition. Oxford Univ. Press, 2016

2. Hernando Lautaro Fernandez-Canque by Taylor & Francis Group, LLC, 2017

3.Jacob Millman, C. Halkias and Satyabrata Jit Electronic Devices and Circuits, 4TH Edition, Tata McGraw-Hill, 2015.

4. Salivahanan, N. Suresh Kumar and A. Vallava Raj, “Electronic Devices and circuits”, TMH, 2nd Edition 2008

1902EC402	SIGNALS AND SYSTEMS	L	T	P	C
		3	1	0	4

Course Objectives:

1. To study and analyze the continuous and discrete-time signals and systems,their properties and representations.
2. To have Knowledge of time-domain representation and analysis concepts asthey relate to difference equations, impulse response and convolution, etc.
3. To familiarize the concepts of frequency-domain representation and analysisusing Fourier Analysis tools, Z-transform.
4. To understand the concepts of the sampling process and to identify and solveengineering problems
5. To analyze the systems by examining their input and output signals

Unit I CLASSIFICATION OF SIGNALS AND SYSTEMS 9+3 Hours

Classification of Signals- Continuous time signals - Discrete time signals - Periodic and Aperiodic signals - Even and odd signals - Energy and power signals -Deterministic and random signals -Complex exponential and Sinusoidal signals. Classification of Systems: Continuous time systems- Discrete time systems - Linear system - Time Invariant system – causal system - BIBO system - Systems with and without memory.

Unit II ANALYSIS OF CONTINUOUS TIME SIGNALS 9+3 Hours

Fourier series analysis-Trigonometric Fourier series, Cosine Fourier series, Exponential Fourier series, Fourier Spectrum of continuous time signals, Fourier transform, Laplace transform.

Unit III LTI CONTINUOUS TIME SYSTEM 9+3 Hours

Analysis of differential equation-Transfer function-Impulse response- Frequency response-Convolution integral- Fourier Methods-Laplace transforms analysis- Block diagram representation – Cascade, Parallel and Direct Form -State variable equation and Matrix.

Unit IV ANALYSIS OF DISCRETE TIME SIGNALS 9+3 Hours

Discrete Time Fourier Transform (DTFT)-Properties of DTFT -Discrete Fourier Transform (DFT)- Z-Transform -Properties of Z - Transform and Inverse Z-Transform.

Unit V LTI DISCRETE TIME SYSTEMS 9+3 Hours

Analysis of differential equation-Transfer function-Impulse response - Convolution sum- Analysis and characterization of DT system using Z transformDifference Equations-Block diagram.

Total: 45+15 Hours

Further Reading:

Programs using mathematical computing tool for CT and DT system analysis using LT and ZT

Course Outcomes:

After completion of the course, Student will be able to

1. Analyze the properties of signals & systems
2. Apply Laplace transform, Fourier transform in signal analysis
3. Analyze continuous time LTI systems using Fourier and Laplace Transforms
4. Apply Z transform and DTFT in signal analysis for Discrete time signals
5. Analyze discrete time LTI systems using Z transform.

References:

1. Allan V.Oppenheim, Allan S.Wilskywith S. Hamid Nawab, “Signals and Systems”, Pearson, Second Edition 2015.
2. Rodger E. Ziemer, William H. Tranter and D. Ronald Fannin “Signals and Systems Continuous and Discrete”, Fourth Edition
3. Simon Haykin and Barry Van Veen, “Signals and Systems” , John Willey &Sons, Inc., Second edition, 2004.
4. B. P. Lathi, “Principles of Linear Systems and Signals”, Second Edition, Oxford, 2009.
5. John Alan Stuller, “An Introduction to Signals and Systems”, Thomson, 2007.
6. Hwei. P.Hsu, Schaum’s Outlines: Signals and Systems, Pearson Education, 2002.
7. Anand Kumar A, “Signals and Systems” , PHI learning Pvt. Ltd., Secondedition, 2012.
8. Michael Roberts, “Fundamentals of Signals & Systems”, 2nd edition, Tata McGraw-Hill, 2010,

1902EC403	ENGINEERING ELECTROMAGNETICS	L	T	P	C
		3	0	0	3

Course Objectives:

1. To impart knowledgeonthebasicsofstaticelectricandmagneticfieldandtheassociated laws.
2. To giveinsight into the propagation of EM waves and also to introduce the methods in computational electromagnetic.
3. To analyze the time varying fields.

UNIT I STATIC ELECTRIC FIELDS **9 Hours**

Co-ordinatesystem–Rectangular–Cylindricalandsphericalco-ordinatesystem—Meaning ofstokestheorem anddivergencetheorem –Coulomb'slawinvectorform –Definition of electricfieldintensity– Electricfielddueto chargesdistributeduniformlyonaninfiniteand finiteline– Electricfieldon theaxis of a uniformlychargedcirculardisc– Electric flux Density – Gauss law – Proof of gauss law – Applications.

UNIT II STATIC MAGNETIC FIELDS **9 Hours**

The Biot- Savartlawin vector form –Magnetic field intensity due to a finite and infinite wire carrying a current I – Magnetic field intensity on the axis of a circular and rectangular loop carrying a currentI –Ampere's circuital law and simple applications–Magnetic flux density TheLorentz force quation for a moving charge and applications –Force on a wire carrying a currentI placed in a magnetic field.

UNIT III ELECTRIC AND MAGNETIC FIELDS IN MATERIALS **9 Hours**

Poisson'sandLaplace'sequation– Electricpolarization –Nature ofdielectricmaterials– Definitionof capacitance– Electrostatic energy and energy density – Boundary conditions for electric fields – Electriccurrent– Currentdensity–Continuityequationfor current– Definitionofinductance–Inductanceofloopsandsolenoids– Definitionof mutualinductance– Energydensityinmagneticfields.

UNIT IV TIME VARYING ELECTRIC AND MAGNETIC FIELDS **9 Hours**

Faraday'slaw–Maxwell'sequationsinintegralform and point form–Displacementcurrent–Ampere'scircuitallawin integralform –Modifiedform ofampere's circuitallawasMaxwell'sfirstequationin integralform – Pointing vectorand the flow of power – Power flow in a co-axial cable – Instantaneous average and complex pointing vector.

UNIT V ELECTROMAGNETIC WAVES **9 Hours**

Derivationofwaveequation–Waveequationinphasorform –Planewavesinfreespaceandinahomogenous material– Waveequationforaconductingmedium –Planewavesinlossydielectrics– Propagationingoodconductors–Skineffect– Linear ellipticalandcircularpolarization –Reflectionofplanewavefrom aconductor–Normalincidence- Dependence on polarization – Brewster angle.

Total: 45 Hours

Further Reading:

Vector analysis - Vector Calculus -Principle of Superposition theorem-Natureof magnetic materials – Magnetization and permeability – Magnetic boundary conditions.

Course Outcomes:

After completion of the course, Student will be able to

1. Explain the fundamentals of electromagnetic.
2. Analyzefieldpotentialsdue tostaticchangesandstaticmagneticfields.
3. Explainhowmaterialsaffectelectricandmagneticfields.
4. Analyze the relationbetween thefieldsunder timevaryingsituations.
5. Discuss the principlesof propagationofuniformplanewaves.

References:

1. Hayt,WH.andBuck,J.A.,"EngineeringElectromagnetics",7thEdition,TMH,2007.

2. Jordan, E.C, andBalmain, K. G., "Electromagnetic Waves and Radiating Systems", 4th Edition, Pearson Education/PHI, 2006.

3.MathewN.O.Sadiku,"ElementsofEngineeringElectromagnetics",4thEdition, Oxford University Press, 2007.

4.Narayana Rao, N., "Elements of Engineering Electromagnetics", 6th Edition, Pearson Education, 2006.

5.Ramo, Whinneryand Van Duzer., "Fields and Waves in Communication Electronics", 3rd Edition, John Wiley and Sons, 2003.

1902EC404 **ANALOG INTEGRATED CIRCUITS** **L T P C**
3 0 0 3

Course Objectives:

1 To learn the fundamental concepts behind Operational Amplifiers and to differentiate small signal and large signal circuit models.
2 To learn the concepts of Active filters, Analog to Digital and Digital to Analog converters for microelectronics.
3 To study the performance metrics of Phase Locked Loop and CMOS differential amplifiers.

Unit I BASICS OF OPERATIONAL AMPLIFIERS 9 Hours

OperationalAmplifiers,DCandACcharacteristics,Typicalop-ampparameters:Finite gain, Finitebandwidth,Offsetvoltagesandcurrents,Common-mode rejectionratio,Powersupply rejectionratio,Slew rate,ApplicationsofOp-amp: Precisionrectifiers, Summingamplifier, Integratorand Differentiator,Logand Antilogamplifiers. Instrumentationamplifiers, Voltage to Currentconverters.

Unit II ACTIVE FILTERS 9 Hours

Secondorder filter transfer function (lowpass,highpass, band passandband reject), Butterworth,Chebyshevand Besselfilters, Switched capacitor filter, Notchfilter,All passfilters and self-tunedfilters.

Unit III ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS 9 Hours

Op-amp asacomparator,Schmitttrigger,Astableand Monostablemultivibrators, Triangular wave generator,Multivibratorsusing 555timer,Dataconverters:A/Dand D/A converters.

Unit IV PHASE LOCKED LOOP 9 Hours

PLL- Basicblockdiagramandoperation, Fourquadrant multipliers,Phasedetector,VCO, ApplicationsofPLL: Frequencysynthesizers,AMdetection,FM detectionandFSK demodulation.

Unit V CMOSDIFFERENTIALAMPLIFIERS 9 Hours

DCanalysisandsmallsignalanalysisofdifferentialamplifier withResistiveload,currentmirrorloadand currentsourceload,Inputcommon-moderange andCommon-modefeedbackcircuits.OTAsvs Op-amps. Slew rate,CMRR,PSRR.Two stage amplifiers,Compensationin amplifiers (Dominantpolecompensation).

Total: 45 Hours

Further Reading:

Collector Emitter Feedback Bias.

Course Outcomes:

After completion of the course, Student will be able to

1 Implement basic applications of Op-amp using IC 741.
2 Interpret the concept of Active filter for Analog integrated circuits.
3 Construct an Multi vibratorsusing IC 555 and Data Converters for Analog integrated circuits.
4 IllustratethefunctionofapplicationspecificICssuchasVoltageregulators,PLL and itsapplicationin communication.
5 Describe the working of CMOS Differential amplifier in Analog integrated circuits.

References:

1 S.Franco,DesignwithOperational AmplifiersandAnalog IntegratedCircuits, Third edition TMH,2003.
2 Sedra and Smith,MicroelectronicsCircuits, First edition, Oxford Univ.Press, 2004.
3 Coughlin,Driscoll,OP-AMPS andLinear IntegratedCircuits, First edition, Prentice Hall,2001.
4 John D Ryder, ―Electronic fundamentals and Applications: Integrated and Discrete systems, 5th Edition, PHI, 2003
5 Donald .A. Neamen, Electronic Circuit Analysis and Design –Second edition, Tata McGraw Hill, 2009

1902EC405 MICRO PROCESSOR AND MICRO CONTROLLER

L	T	P	C
3	0	0	3

Course Objectives:

To teach the architecture and functions of 8085 and 8086 Microprocessors.
To impart the concepts of 8051 microcontroller.
To convey aspects of I/O and Memory Interfacing circuits.

UNIT I INTRODUCTION TO MICROPROCESSORS 9 Hours

Evolution Of Microprocessors - 8-Bit Processor - 8085 Architecture, Register Organization, Instruction Sets, Timing Diagram, Addressing Modes, Interrupts, Interrupt Service Routines- Assembly Language Programming Using 8085.

UNIT II 8086 MICROPROCESSORS 9 Hours

Introduction to 8086 – Microprocessor architecture – Addressing modes - Instruction set and assembler directives – Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros – Interrupts and interrupt service routines - 8086 signals

UNIT III MICROCONTROLLERS 9 Hours

Architecture of 8051 – Special Function Registers (SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

UNIT IV I/O INTERFACING 9 Hours

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – D/A and A/D Interface - Timer – Keyboard /display controller – Interrupt controller – DMA controller

UNIT V APPLICATIONS 9 Hours

Home automation, Wireless Sensor monitoring, Smart Lighting, Smart Appliances, Smart Cities, Environment Monitoring,Case studies: Chasing LEDs, LED Dice, Real Time Clock, Digital Voltmeter with LCD, Calculator with Keypad and LCD, Serial Communication Based Calculator.

Total: 45 Hours

Further Reading:

1. Raspberry pi
2. Machine learning using raspberry pi

Course Outcomes:

After completion of the course, Student will be able to
Construct hardware, software and programming concepts of Microprocessor
Summarize architecture, instructions and addressing modes of 8086 Microprocessor
Describe addressing modes, Architecture, pins of 8051 Microcontroller
Illustrate interfacing of Serial, parallel, Keyboard, Display with Microcontroller
Use the programming concepts to write assembly language programs

References:

Milan Verle, "PIC Microcontrollers- Programming in C", mikroElektronika Publications, 2009.
Lucio Di Jasio "Programming 16-Bit PIC Microcontrollers in C: Learning to Fly the PIC 24" 2nd Edition Newnes 2011
Ramesh Gaonkar "Microprocessor Architecture, Programming, and Applications with the 8085"- 5th edition Penram International Publishing-2000.
SepehrNaimi, Sarmad Naimi, Muhammad Ali Mazidi "The AVR Microcontroller and Embedded Systems Using Assembly and C: Using Arduino Uno and Atmel Studio" 2nd edition MicroDigitalEd 2017
Martin Bates, "Interfacing PIC microcontrollers-Embedded Design by Interactive Simulation", 2nd edition Newnes Publication, 2013
PIC 16F877 datasheet-Microchip

E-References:

https://www.coursera.org/learn/raspberry-pi-interface (University of California)
https://www.coursera.org/learn/raspberry-pi-platform (University of California)

		L	T	P	C
1902EC451	**ELECTRONICS AND INTEGRATED CIRCUITS LABORATORY**	**0**	**0**	**2**	**1**

Course Objectives:

6 To understand the basics of Analog integrated circuits and available Ics.
7 To gain hands on experience in designing Analog integrated circuits.
8 To learn PSPICE software used in circuit design.
9 To apply operational amplifiers in linear and non-linear applications.

LIST OF EXPERIMENTS:
DESIGN, SIMULATION AND IMPLEMENTATION OF

1. Inverting, Non inverting and Differential amplifiers.
2. Integrator and Differentiator.
3. Instrumentation amplifier
4. Active low-pass, High-pass,band-pass, and Band stop filters.
5. Astable& Monostable multivibrators and Schmitt Trigger
6. Phase shift and Wien bridge Oscillator
7. Astable and monostable multivibrators using NE555 Timer.
8. PLL characteristics and its use as Frequency Multiplier.
9. RPS power supply using LM317 and LM723.

M**INI PROJECT:**
Mini project using Op-Amp and Specialized IC's.

List of Hardware/Software Required

1.CRO (Min 30MHz) – 15 Nos.
2. Signal Generator /Function Generators (2 MHz) – 15 Nos.
3. Dual Regulated Power Supplies (0 – 30V) – 15 Nos.
4. Digital Multimeter – 15 Nos IC tester - 2 Nos.
5. Standalone desktops PC – 15 Nos.
6. SPICE Circuit Simulation Software: (any public domain or commercial software) Components and Accessories: - 50 Nos.
7. Transistors, Resistors, Capacitors, diodes, Zener diodes, Bread Boards, Transformers, wires, Power transistors, Potentiometer, A/D and D/A convertors, LEDs.
Note: Op-Amps uA741, LM 301, LM311, LM 324, LM317, LM723, 7805, 7812, 2N3524, 2N3525, 2N3391, AD 633, LM 555, LM 565 may be used.

TOTAL 45 HOURS

Course Outcomes:
After completion of the course, Student will be able to

1 Design oscillators and amplifiers using operational amplifiers.
2 Design filters using Op-amp and perform experiment on frequency response.
3 Analyse the working of PLL and use PLL as frequency multiplier.
4 Design Regulated power supply using ICs.
5 Analyse the performance of oscillators and multi vibrators using PSPICE

		L	T	P	C
1902EC452	**MICROPROCESSORS AND MICROCONTROLLERS LABORATORY** (Common to B.E / B.Tech – ECE,CSE & IT)	**0**	**0**	**4**	**2**

Course Objectives: **The student should be made to:**

1. Write ALP for arithmetic and logical operations in 8085, 8086 and 8051
2. Differentiate Serial and Parallel Interface
3. Interface different I/Os with Microprocessors& Microcontrollers
4. Be familiar with MASM

List of Experiments:

8085 Programs using kits

1. Basic arithmetic operations
2. Basic Logical operations
3. Ascending and descending
4. Maximum and minimum number

8086 Programs using kits

5. Move a data block without overlap
6. Floating point operations, string manipulations
7. Code conversion.
8. sorting and searching

8051 Experiments using kits

9. Basic arithmetic and Logical operations
10. Square and Cube program, Find 2's complement of a number

Peripherals and Interfacing Experiments

11. Traffic light control
12. Stepper motor control
13. Key board Display
14. Serial interface and Parallel interface and Printer status.
15. A/D and D/A interface and Waveform Generation

Total: 45 Hours

Additional Experiments: https://www.intel.in

Basic experiments using Arduino processor

Course Outcomes:

After completion of the course, Student will be able to

1. Write ALP Programmes for fixed and Floating Point and Arithmetic
2. Interface different I/Os with processor
3. Generate waveforms using Microprocessors&Execute Programs in 8051
4. Explain the difference between simulator and Emulator

1904GE451	LIFE SKILLS - REASONING	L	T	P	C
		0	0	2	0

Course Objectives:

1. To help students comprehend and use vocabulary words in their day to day communication.
2. To apply appropriate reading strategies for interpreting technical and non-technical documents used in job-related settings
3. To ensure students will be able to use targeted grammatical structures meaningfully and appropriately in oral and written production
4. To enable the students to arrange the sentences in meaningful unit and to determine whether constructions rely on active or passive voice
5. To Apply the principles of effective business writing to hone communication skills
6. To apply the principles of business etiquettes and Market surveying.

UNIT I VOCABULARY USAGE 6 Hours

Introduction - Synonyms and Antonyms based on Technical terms – Single word Substitution – Newspaper, Audio and video listening activity.

UNIT II COMPREHENSION ABILITY 6 Hours

Skimming and Scanning – Social Science passages – Business and Economics passages – latest political and current event based passages – Theme detection – Deriving conclusion from passages

UNIT III BASIC GRAMMAR AND ERROR DETECTION 6 Hours

Parallelism– Redundancy – Ambiguity – Concord - Common Errors – Spotting Errors – Sentence improvement– Error Detection FAQ in Competitive exams.

UNIT IV REARRANGEMENT AND GENERAL USAGE 6 Hours

Jumble Sentences – Cloze Test - Idioms and Phrases – Active and passive voice – Spelling test.

UNIT V APPLICATION OF VERBAL ABILITY 6 Hours

Business Writing - Business Vocabulary - Delivering Good / Bad News - Media Communication - Email Etiquette – Report Writing - Proposal writing – Essay writing– Indexing –Market surveying.

Total: 30 Hours

Course Outcomes:

After completion of the course, Student will be able to

Construct new words in their day to day communication.

Predict the information swiftly while reading passages.

Elaborate their oral and written communication.

Rephrase the sentences and able to identify the voice of the sentence.

Summarize their knowledge of the best practices to craft effective business documents

Make use of the etiquettes in business.

References:

1. Arun Sharma and Meenakshi Upadhyav, How to Prepare for Verbal Ability and Reading Comprehension for CAT, McGrawHill Publication, Seventh Edition 2017
2. R S Aggarwal and Vikas Aggarwal , Quick Learning Objective General English ,S.Chand Publishing House, 2017
3. Dr.K.Alex, Soft Skills,S.Chand Publishing House, Third Revise Edition, 2014
4. Raymond Murphy, Essential English Grammar in Use, Cambridge University press, New Delhi, Third Edition , 2007