JABALPUR ENGINEERING COLLEGE, JABALPUR (MP)
(An Autonomous Institute of Govt. of M.P.)
Affiliated to Rajiv Gandhi Technological University, Bhopal (MP)
Scheme of Study and Examination (w.e.f. July 2010)

BE (PTDC) **Sem : Third** **Branch : Electronics & Telecom. Engg**

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
		L	T	P	SESSIONAL EXAM			ESE	SUB TOTAL	
					TA	CT	TOT			
MA-03	Mathematics - III	3	1	-	10	20	30	70	100	4
EC-11	Digital Electronics	3	1	-	10	20	30	70	100	4
EC-10	Signals & Systems	3	1	-	10	20	30	70	100	4
EC-19	Analog Electronics	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
EC-20L	Analog Electronics Lab	-	-	2	20	-	20	30	50	2
EC-53L	Digital Electronics Lab	-	-	2	20	-	20	30	50	2
CS-05L	Computer Prog. Lab - II	-	-	2	20	-	20	30	50	2
EC-55L	Professional Activity- II	-	-	2	20	-	20	30	50	2
	Total	**12**	**4**	**8**	**150**	**80**	**230**	**370**	**600**	**24**

T.A. Teachers Assessment, CT- Class Test, ESE - End Semester Examination, Total Marks 600 Total Periods : 24, Total Credits : 24

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COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
	MATHEMATICS- III	MA03	Min "D"	Min "D"	5.0

MATHEMATICS – III

Unit – I : Fourier Series : Conditions for a fourier expansion, having finite number of discontinuities, change of interval and half- rang series.

Laplace transform and inverse Laplace transform of simple functions, their elementary properties and application in solution of ordinary differential equations.

Unit – II : Analytic functions, Harmonic conjugates, Cauchy-Reimann equations, line integral, cauchy's theorem, Cauchy's integral formula, poles, residues, Residues theorem, evaluation of real integral, Bilinear transformation.

Unit – III : Difference operators, errors and approximation, interpolation (Newtons interpolation formulae, Central interpolation formulae, Lagranges interpolation, Newtons divided difference interpolation – formula inverse interpolation.

Numerical differentiation, maxima and minima.

Unit – IV : Numerical integration by using simpson's method, weddels rule, Gauss-Legendre open quadrature formula.

Solution of algebraic and transcendental equations by using Regula-Falsi, Newton-Rephson, iterative, Graffes root squaring method, Bairstow's method.

Unit – V : Solution of simultaneous algebraic equatins by using gauss elimination, Gauss-Jorden, Crout's jacobbi iterative, Gauss-siedal, Relaxation methods.

Solution of ordinary differential equations (Taylor series, Picard's Modified Euller method, Runge-kutta, predictor corrector method.)

References :

1. Laplace transform, by R.V. Churchill
2. Higher Engineering Mathematics by B.V Ramanna, TMH
3. Advanced Engineering Mathematics by Kreysizig E, willey Eastern Limited.
4. Introductory Methods of Numerical Analysis by S.S. Sastry
5. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.

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COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E.	DIGITAL ELECTRONICS	EC11	Min "D"	Min "D"	5.0

DIGITAL ELECTRONICS

Unit 1 Number System and Codes

Number System, Conversion between Number System, Binary, Octal, Hexadecimal Arithmetic, Signed Arithmetic, Complements Arithmetic, Floating Point Arithmetic, Binary Codes, Weighted & Unweighted Codes, Code Conversion & Arithmetic.

Unit 2 Switching Algebra & its Applications

Fundamental Postulates, Basic Properties, Switching Expression & Manipulation, De- Morgan's Theorem, Switching Functions, SOP,POS, Canonical Form, Review of logic Gates, Electronic Gate Network, Minimization of Switching Functions (K-map, Prime Implicants)

Unit 3 Combinational Circuit

Circuit Design, Adder, Subtractor, Ripple Carry, Carry Look-a-head, BCD Adder, Series & Parallel Adder, Encoder, Decoder, MUX, DEMUX, Converters.

Testing of Combinational Circuit, Fault Models, Switching Level Fault Model (Stuck), Structural Testing, Path Sensitization.

Unit 4 Sequential Circuit

Latches, Flip-Flops (SR, JK, T and D) Edge triggered, Level triggered, Master-Slave Flip-Flop, Conversion Flip-Flop, Registers, SISO, SIPO, PISO, PIPO, Universal Shift Register, Sequence Generator, Counter, Synchronous & Asynchronous, Ring Counter, twisted Ring, Clock Driven Sequential Circuit, Moore & Mealy Model, State Reduction, State Assignment.

Unit 5 Logic Family

Digital IC's, Current Sourcing & Sinking Logic, RTL, DTL, TTL, Totem-Pole, Open Collector Output, Tristate Output, ECL, IIL, CMOS & PLD's.

Textbooks:

1. Digital Logic and Computer Design : Mano M. M.
2. Switching & Finite Automata Theory : Kohavi Z. and Jha N. K.
3. Digital Circuits and Design : Salivahanan and Vahagan A.
4. Modern Digital Electronics: Jain R.
5. Digital Fundamentals: Floyd T. L.

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COURSE CONTENT & GRADE (w.e.f. July 2010)

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			T	P	
B.E.	SIGNALS & SYSTEMS	EC10	Min "D"	Min "D"	5.0

SIGNALS & SYSTEMS

Unit I Signals and Systems.

Signals: Classification of signals, Continuous-Time and Discrete-Time Signals, Periodic and Aperiodic, Even and Odd, Causal and Non-Causal, Deterministic and Random, Energy and power signals, Energy Theorem, Power Theorem, Cross-correlation, auto-correlation, ESD, PSD, Singularity Functions.

Systems: Classification of System and Basic System Properties, System with & without memory, invertibility & inverse system, Causality, Stability, Time-Invariance, Linearity.

LTI system: Response, Convolution Integral, Properties & Eigen Function of LTI system, System described by difference and differential equation.

Unit II Fourier analysis of Signals

Fourier series: Fourier series representation of Continuous-Time periodic signals, convergence & properties of Continuous-Time Fourier series, Fourier series representation of Discrete-Time periodic signals, properties of Discrete-Time Fourier series, Fourier series and LTI systems

Fourier transforms: Representation of Aperiodic signals, Continuous-Time Fourier transform, Discrete-Time Fourier transform, Spectrum plot, Fourier transform of periodic signal, Properties and Applications of Fourier transform(Hilbert transform), Frequency Response of LTI Systems.

Unit III Sampling

Sampling theorem, Reconstruction of original signals from its samples, Alising, Anti-alising, Interpolation, Sample & Hold Circuit, Multirate Sampling, Sampling of band-pass signals, Discrete-time processing of Continuous-time Signals, Sampling of discrete time signals.

Unit IV Z-Transform

Z-Transform, Region of Convergence, Inverse Z-Transform, Properties of Z-Transform, Applications of Z-Transform, Analysis and Characteristic of LTI Systems using Z-Transform, System Function Algebra and Block Diagram Representation, Unilateral Z-Transform.

Unit V Laplace Transform

Laplace transform, Region of Convergence, Inverse Laplace Transform, Properties of Laplace Transform, Applications of Laplace Transform, Laplace Transform of Some Common Signals, Unilateral Laplace transform, Relation between different transforms.

Reference books:

1. Oppenheim, Willsky and Nawab: Signals and Systems, PHI
2. Simon Haykins, B.V.Vean: signals and systems, John Wiley & Sons, Inc.
3. H. P. Hsu: Schaum's Outline of Signals & Systems, MGH
4. David McMahon: Signals and Systems demystified, MGH
5. B.P.Lathi: Linear Systems & Signals, Oxford Series

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			T	P	
B.E.	ANALOG ELECTRONICS	EC19	Min "D"	Min "D"	5.0

ANALOG ELECTRONICS

UNIT –I Transistor Biasing & Thermal Stabilization:

Introduction to load line analysis, operating Point, Causes of shift of operating Point, Means of achieving Operating point stability, Biasing methods of transistor: Biasing - Requirements of biasing, Relation between the leakage currents, Thermal runaway, Stability factors, Biasing methods-Fixed bias, Collector to base, Emitter bias, voltage divider bias, Approximate Method, Exact analysis of Voltage Divider Bias, Biasing of FET & MOSFET, Bias Compensation: compensation for I_{CO},Thermistor compensation ,compensation for V_{BE}, Comparison of Biasing Methods, Heat sink.

UNIT –II Amplifier Fundamentals:

Gain & Frequency Response of Amplifiers, Common Base amplifier, Common Emitter Amplifier, Classification of Amplifiers, Linear model of BJT, Approximate analysis of CE, CB, & CC Amplifiers, Exact analysis of CE Amplifier - Typical H- parameter, Conversion of h-parameters, Small signal amplifier ,Rules to get D.C & AC equivalent Circuits, low Frequency Common Source & Common Drain(Source follower) FET Amplifier, High frequency Effects & Hybrid π Model for CE Transistor, Elements in terms of low frequency h-parameters, Analysis of transistor circuit using hybrid π model, High frequency Common Source & Common Drain(Source follower) amplifier, Cascode amplifier, Wideband Amplifier, Darlington Configuration, Miller's Capacitance(miller's Theorem)

UNIT – III Multistage, Tuned & Differential Amplifier:

Multistage amplifier – Cascading of transistor amplifier, Choice of transistor Configuration in a multistage amplifier, Coupling methods, Analysis of RC coupled CE amplifier , Small signal transformer coupled transistor amplifier ,Direct coupled amplifier, spurious responses in amplifiers.

Tuned Amplifier: Single Tuned, Double Tuned, & Stagger Tuned Amplifiers.

Differential Amplifier : Difference Amplifier, The Differential amplifier, Tail Current, AC analysis of Differential amplifier, Inverting & Noninverting inputs Differential input, common mode input, analysis of differential amplifier.

UNIT–IV Power Amplifiers:

Power amplifier, Decibel notation, Maximum efficiency of RC Coupled Class A Amplifier, Transformer Coupled Class A Amplifier, Class B Amplifier, Class B Push Pull amplifier, Distortion, Effect of cascading of amplifiers on Bandwidth, Two Stage RC Coupled Amplifier, Transformer coupled Amplifier, Direct coupled Amplifier, Push pull Amplifiers, Reduction of harmonics, Class A Push pull Amplifier, Class B Push pull Amplifier, Complementary Symmetry Push Pull amplifier

UNIT– V Negative Feedback Amplifiers & Oscillators:

Negative Feedback amplifiers: Voltage series, Voltage shunt, Current series, Current Shunt Negative Feedback amplifiers & their analysis, Advantages of Negative feedback amplifiers

Oscillators: Positive Feedback amplifier, Bharkhausen's Criteria, Analysis of Colpitt's oscillator, Analysis of Hartley Oscillator, Analysis of RC phase shift Oscillator, Analysis & Frequency of Wein Bridge Oscillator, Crystal oscillator, General theory of Hartley & Colpitt's FET Oscillator.

REFERENCES:

1. Millman and Halkias : Integrated Electronics, TMH
2. Boylestad and Nashelsky: Electronic Devices and Circuit Theory, PHI
3. Sedra and Smith : Microelectronics, Oxford Press
4. Graham Bell : Electronic Devices and Circuits, PHI
5. Donald A Neamen: Electronic Circuits Analysis and Design, TMH
6. S. Rama Reddy: Electronic Devices and Circuits, Alpha Science International Limited

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B.E.	ANALOG ELECTRONICS LAB	EC20L	Min "D"	Min "D"	5.0

ANALOG ELECTRONICS LAB

List of Experiments (Expandable):

1) Design and Performance of transistor Amplifier in CE, CB and CC Configuration.
2) Design and Performance Evaluation of FET amplifier.
3) To Study & Measure the following Parameters of the Darlington pair Emitter Follower Amplifier.
   a) Voltage
   b) Phase relationship between i/p & O/P
   c) i/p & o/p Impedance
4) To Study the Operation of a Boot strap integrator.
5) To Study the Performance Characteristics of a Transformer Coupled Amplifier.
   a) To plot the frequency Response Curve
   b) To find the lower & upper cut off frequency & Find out the B W of the Amplifier.
6) To Study Push – Pull Amplifier using transistor.
7) To Study & Determine Gain & CMRR of Differential Amplifier.
8) To Study R C Phase Shift Oscillator & Calculate the frequency of Oscillation.
9) To Study L C Colpitt Oscillator & Calculate the frequency of Oscillation.
10) To Study L C Hartley Oscillator & Calculate the frequency of Oscillation.
11) To Study Wien's Bridge Oscillator & Calculate the frequency of Oscillation.

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B.E.	DIGITAL ELECTRONICS LAB	EC53L	Min "D"	Min "D"	5.0

The exercises in this component shall be designed to demonstrate the basic principles outlined in different units of the theory paper. After completing the exercises the student should have developed a good grasp of the practical utilities of the theory content.

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	COMPUTER PROGRAMING LAB-II	CS05L	Min "D"	Min "D"	5.0

Introduction

- Creation of Java, importance of Java to internet, Java buzzwords
- JVM –The heart of Java
- Java's Magic Bytecode

Language Fundamentals

- The Java Environment:
- Installing Java.
- Java Program Development
- Java Source File Structure
- Compilation
- Executions.
- Basic Language Elements:
- Lexical Tokens,Identifiers
- Keywords,Literals, Comments
- Primitive Datatypes,Operators
- Assignments.
- Console Input and output in java
- Branch control and loop control statements

Object Oriented Programming

- Class Fundamentals.
- Object & Object reference.
- Creating and Operating Objects.
- Constructor & initialization code block.
- Use of Modifiers with Classes & Methods.

Extending Classes and Inheritance

- Use and Benefits of Inheritance in OOP
- Types of Inheritance in Java
- Inheriting Data Members and Methods
- Interfaces.

Exception Handling:

- The Idea behind Exception
- Exceptions & Errors
- Types of Exception
- Use of try, catch, finally, throw, throws in Exception Handling.

Thread :

- Understanding Threads
- Needs of Multi-Threaded Programming.
- Thread Life-Cycle

Applet

- Applet & Application
- Applet Architecture.
- Embedding Applets in Web page.

GUI Programming

- Components and Containers
- Basics of Components
- Using Containers
- Layout Managers
- AWT Components

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Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E.	PROFESSIONAL ACTIVITY- II	EC55L	Min "D"	Min "D"	5.0

PROFESSIONAL ACTIVITY- II

Objective – The aim of professional activity is to impart training in developing capabilities of students in expressing their views on technical topics. Students can choose any topic related to electronics & communication branch theoretically or can fabricate practical working models on which lecture could be delivered . Practical working model demonstration in group is also permitted. Model fabrication under the professional activity shall be encouraged. Students who have made technical visits can also write & present report on it.

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