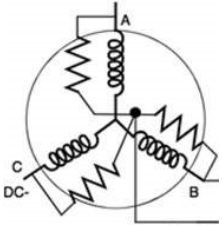
VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

STUDENT HAND BOOK
Academic Regulations (Autonomous) and Syllabi of THIRD YEAR B.E (EEE) w.e.f 2016-17



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
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DEPARTMENT VISION

Excellence in quality education by keeping pace with rapidly changing technologies and create manpower of global standards in the field of Electrical and Electronics Engineering.

DEPARTMENT MISSION

To impart in depth knowledge to students, so that they acquire the skills to innovate, excel and lead in their professions with values and ethics that will benefit society.

Program Educational Objectives (PEO's)

- **PEO 1**: Electrical Engineering Graduates will acquire technical competence to analyze, design and solve engineering problems in the field of electrical engineering and use modern engineering tools, techniques and software.
- **PEO 2**: Graduates will be able to acquire necessary skills and obtain employment and will be productive in the professional practice of Electrical Engineering and related fields.
- **PEO 3**: Graduates will be sensitive to professional and social contexts, committed to ethical action and engaged in lifelong learning skills demonstrated by higher education / higher degrees and professional development activities.

ABOUT THE COLLEGE

VISION

Striving for a symbiosis of technological excellence and human values

Established in 1981 by Vasavi Academy of Education under the stewardship of Late Sri Pendekanti Venkata Subbaiah, a veteran statesman of independent India and by a few eminent people from different walks of life Vasavi College of Engineering represents a rich tradition of excellence in technology based education in a stimulating environment. From a modest beginning with just three undergraduate programs, viz., B.E. degree programs in Civil, Mechanical and Electronics & Communication Engineering, with dedicated efforts for over **33** years, it has now grown into a mighty center of learning with excellent and well-developed infrastructural facilities, offering 6 undergraduate programs, viz., B.E. in Civil, Mechanical, Electrical & Electronics, Electronics & Communication Engineering, Computer Science & Engineering, and Information Technology, in addition to a 3-year postgraduate program in Computer Applications (MCA), and 2-Year Postgraduate Programmes in CSE, ECE, EEE and Mechanical Engineering.

MISSION

To arm the young brains with competitive technology and nurture the holistic development of the individuals for a better tomorrow.

All the undergraduate (B.E) programs were accredited by National Board of Accreditation (NBA) for the academic years 2013-2015. The college sought fresh approval for NBA accreditation for two eligible PG programs and MCA program. The college has been recognized under 12(B) and 2(f) sections of the University Grants Commission (UGC).

The college has been granted ***autonomy by the University Grants Commission***, New Delhi and Osmania University, Hyderabad for all the programs it offers for a period of six years with effect from 2014-15.

The College has 185 highly qualified and experienced faculty members consisting of Professors, Associate Professors and Assistant Professors and around **158** technical and supporting staff. The college has very good infrastructural facilities which go beyond the curriculum requirements. The college offers value-added courses in GIS, CAD/CAM, DSP, VLSI, Networking, J2EE and communication skills to bridge the gap between the curriculum and the requirements of the Industry. Finishing school has been made part of curriculum from the second year onwards to improve the skills of the students.

QUALITY POLICY

Education without quality is like a flower without fragrance. It is our earnest resolve to strive towards high standards of teaching, training and developing human resources.

A Research & Development (R&D) Cell is established by personnel from industry / research organization to encourage the faculty and the students in acquiring additional qualifications and knowledge.

This Cell also facilitates the faculty for interaction with industry/research organizations in getting sponsored research projects. In addition, the college extends consultancy in various fields of engineering and technology. The Center for Counseling and Placement at Vasavi College of Engineering provides personal and career-related support to its students. The educational experience at the college is enlivened and enriched by an array of extra-curricular activities to fulfill the cultural and emotional needs of students.

A good number of ranks in university examinations are secured by our students every year. The all-round development of a student is achieved by exposing him/her to the outside world in a systematic and well planned manner. Just not marks and ranks, but also ethics and morals are incorporated into psyche of a student at Vasavi in a cautious way. This unification of tradition and technology makes Vasavi a place for paradise of learning.

ACADEMIC RULES AND REGULATIONS
FOR FOUR YEAR B.E DEGREE COURSE
w.e.f 2016-17 Academic Year

1. RULES OF PROMOTION

ATTENDANCE: The ***minimum aggregate attendance*** percentage for BE program ***is 75%***. On medical grounds 65% attendance with valid medical certificate will be considered. A candidate who did not meet above attendance requirements is not eligible to appear for the semester examinations.

A student is allowed to use medical condonation facility only 4 (four) times in the entire period of 8 semesters in the span of 4 years B.E program.

2. ASSESSMENT AND EVALUATION SYSTEM:

There will be continuous and comprehensive evaluation of students. The distribution of sessional (internal) and semester examination marks for ***B.E program*** are given below:

SESSIONALS EXAMS (internals)
Theory: **30 Marks**

- **20** Marks each for two internal examinations in a semester and 10 marks for assignments and quizzes etc together.
- **Average of two tests** will be considered for calculating internal exams marks to which assignment/quiz marks will be added for obtaining total CIE marks.
- Every student should secure a **minimum of 40% aggregate marks in the internal exams.**

Lab: 25 Marks

15 marks for day-to-day laboratory class work which will be awarded based on the average of all experiments.
- 10 marks for the internal examination.

SEMESTER EXAMS

- Semester theory examinations will be conducted for 70 marks. A student should secure a minimum of 40% marks in each subject for a pass.
- Semester laboratory examinations will be conducted for 50 marks. A student should secure a minimum of 50% marks for a pass.

In addition, a student shall secure a minimum of 40% marks in a theory subject and 50% marks in lab from sessional exams and semester examinations put together for a pass.

3. PROMOTION RULES TO NEXT HIGHER CLASS

S No	Semester /Class	Conditions to be fulfilled for
1	From 1/4 BE, I-SEM to 1/4 BE, II-SEM	Regular course of study of 1/4 B.E, I-SEM and 40% aggregate sessional marks in I-SEM
2	From 1/4 BE, II-SEM to 2/4 BE, I SEM	(a) Regular course of study of 1/4 B.E-II SEM and (b) Must have secured at least 50% of total credits prescribed for 1/4 B.E.
3	From 2/4 BE, I-SEM to 2/4 BE, II-SEM	Regular course of study of 2/4 BE, I-SEM and 40% aggregate sessional marks in II- SEM
4	From 2/4 BE, II-SEM to 3/4 BE, I SEM	(a) Regular course of study of 2/4 BE II SEM (b) Must have secured at least 50% of total credits prescribed for 2/4B. E and passed in all the subjects 1/4 B.E.
5	From 3/4 BE, I-SEM to 3/4 BE, II-SEM	Regular course of study of 3/4 B.E, I-SEM, and 40% aggregate sessional marks in I- SEM
6	From 3/4 BE, II-SEM to 4/4 BE, I SEM	(a) Regular course of study of 3/4 B.E, II-SEM (b) Must have secured at least 50% of total credits prescribed for 3/4 B.E and passed in all the subjects 2/4 B.E.
7	From 4/4 BE, I-SEM to 4/4 BE, II-SEM	(a) Regular course of study of 4/4 B.E, I-SEM and 40% aggregate sessional marks in II-SEM

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
B.E. III YEAR - I-SEMESTER

S.NO	Sub reference Code	Subject	Scheme of Instructions				Scheme of Examination			Credits
			Periods per week				Duration in Hrs	Maximum Marks		
			L	T	D	P		SEM. Exam.	Sessional	
THEORY										
1	EE 3010	Power System- II	4		-	-	3	70	30	3
2	EE 3020	Electrical Machinery - II	4	1	-	-	3	70	30	3
3	EE 3030	Power Electronics	4	1	-	-	3	70	30	3
4	EE 3040	Linear Integrated Circuits	4		-	-	3	70	30	3
5	EE 3050	Linear Control Systems	4	1	-	-	3	70	30	3
6	EE 3110	Finishing School- III: Technical Skills	2	-	-	-	1.5	35	15	1
7	HS 3110	Finishing School -III: Soft Skills	2	-	-	-	1 .5	35	15	1
PRACTICALS										
8	EE 3031	Electrical Machines-I Lab	-	-	-	3	3	50	25	2
9	EE 3041	Control System Lab	-	-	-	3	3	50	25	2
10	EE 3051	Mini Project	-	-	-	3	3	-	25	2
		TOTAL	**24**	**3**	**-**	**9**	**-**	**520**	**255**	**23**
		GRAND TOTAL	**36**					**775**		

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR- I-SEMESTER
POWER SYSTEM- II

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3010**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
Enable the student to 1. Acquire knowledge of Transmission Lines Performance, Power circle diagrams & Corona. 2. Understand the Per Unit system of Representation, load flow studies and different load flow methods. 3. Learn about the Symmetrical Fault analysis and S.C capacity of a Bus. 4. Acquire the knowledge of the fundamentals of Sequence components, Sequence networks of Generator, T/F, T.M.L & Load and Unsymmetrical Fault analysis of power system. 5. Understand the concept of Travelling Wave theory and Bewley Lattice diagram.	1. Able to **calculate** and **compare** the performance (Constants A, B, C & D, voltage regulation & efficiency) of different types of Transmission lines. 2. Able to **differentiate** and **choose** the proper load flow method for solution of load flow problems. 3. Student can **calculate** the P.U quantities in power system and **analyze** symmetrical fault (LLL-Fault) and **calculate** S.C capacity of a Bus. 4. Able to draw the **diagram** of Sequence networks of different components and **calculate** the Unsymmetrical Fault (LG, LL, LLG & LLLG) current value & MVA values. 5. Student can **evaluate** the value of coefficient of reflection and refraction of voltage or current wave and **construct** Bewley Lattice diagram.

UNIT-I

Transmission Line Theory: Short, medium, long lines – Line calculations, Tuned lines – Power circular diagrams and their applications. Corona : Causes – Disruptive and Visual Critical Voltages, Power loss – minimization of Corona Effects.

UNIT-II

Per Unit system of Representation : Use of per Unit Quantities in power systems, Advantages of per unit system.
Load flow studies: Formation of Y bus for a system, modeling of tap changing and phase shifting transformer, formulation of load flow problem, Solution of load flow by Gauss-Seidel, Newton-Raphson, Decoupled and fast Decoupled methods, comparison of different load flow methods.

UNIT-III

Z-bus formation - Symmetrical Three phase Transients in R-L series circuits – short circuit currents – Reactances of Synchronous Machines – Symmetrical Fault calculations. short circuit capacity of a bus.

UNIT-IV

Unsymmetrical faults : Symmetrical components of unsymmetrical phasors – Power in terms of symmetrical components - sequence impedance and sequence networks. Sequence networks of unloaded generators – Sequence impedances of circuit elements – Single line to ground, line-to-line and double line to ground faults on unloaded generator – Unsymmetrical faults of power systems.

UNIT-V

Transients in power systems : Causes of over voltages : Traveling Wave Theory – Wave equation – Open Circuited Line – The short circuited line – Junction of lines of different natural impedances – Reflection and refraction – Coefficients – Junction of Cable and overhead lines – Junction of three lines of different natural impedances – Bewley Lattice diagram.

Suggested Reading:

1. C.L. Wadhwa , Electrical Power Systems, Wiley Eastern Ltd., 4th Ed. 2006.
2. John J.Grainger William D. Stevenson Jr. Power System Analysis, Tata MCGraw Hill Edn.2003
3. I.J.Nagrath & D.P.Kothari "Modern Power Systems Analysis" TMH Edition, 2003.
4. A. Chakrabarti, M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A Text book on Power System, Dhanpat Rai & Co(P) Ltd.
5. Chakravarthy, Power System Operation and Control.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR- I-SEMESTER

ELECTRICAL MACHINERY – II

Instruction : 4+1 Periods/week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3020**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
The aim of this course is: 1. To study the parallel operation of single phase transformers and analyze the behaviour for different conditions. 2. To provide an understanding of different connections and phase conversions of three phase transformer and analyze their behaviour. 3. To explain the principle of operation of three phase induction motor and their operating characteristics and analyze the performance with the equivalent circuit parameters. 4. To contrast different methods of speed control of three phase induction motor and analyze their slip-torque characteristics. 5. To analyze the behaviour of three phase induction motor under unbalanced operation.	The student will be able to: 1. Demonstrate the effective single phase parallel operation and calculate the load shared by each transformer. 2. Identify suitable connection of three phase transformer for different applications. 3. Select suitable three phase induction motor for different applications and also calculate efficiency in the design stage. 4. Interpret the suitable speed control method of three phase induction motor for different applications. 5. Explain the adverse effects of three phase induction motor and three phase transformer under unbalanced operation.

UNIT-I:

Parallel operation of Single phase Transformer and load sharing. Insulation of windings and terminals. Cooling arrangement in Transformers. Testing of Transformers – Routine Tests, and special tests – Measurement of winding resistance. Measurement of voltage ratio and check for voltage – vector relationship. Measurement of No load loss and current. Measurement of insulation resistance. Maintenance of Transformers.

UNIT-II:

Three-phase Transformer – Connections, Choice of Transformer Connections, **Excitation phenomena of transformers** Third harmonic voltages – Phase conversion – 3 phase to 2 phase transformation – Scott connection. Constructional features of three-phase transformer, tertiary winding, parallel operation of transformer, Auto Transformer – Comparison with two winding transformers – Conversion of two winding transformer to auto transformer.

UNIT-III:
Three-phase Induction Motor – Constructional features – Rotating magnetic field theory – Principle of operation of squirrel cage and slip ring motors – Vector diagram, Equivalent circuit – Expression for torque – Starting torque, Maximum torque – Slip/Torque characteristics – Performance characteristics – Equivalent circuits from test – Current loci circle diagram – Predetermination of characteristics of induction motors.

UNIT-IV:
Starting methods of induction motor. Modes of operation. –Torque and power limits of Induction motors. Speed control methods – Resistance control, Voltage control, Pole changing, Cascading, Variable frequency control. Slip power recovery schemes – Kramer drive, Scherbius drive. Double cage inductor motors. Induction generator.

UNIT-V:
Unbalanced Operation: Voltage unbalance – Unbalanced operation of 3-phase induction motor – Per phase equivalent circuits – Single phasing – Unbalance operation of 3-phase transformers – Single phase load on three phase transformers – Single Phasing in 3 phase transformers – Delta/Star and Star/Delta transformers.

Suggested Reading:

1. I.J. Nagarath, D.p.Kothari, Electrical Machines. 4th Edition Tata McGraw Hill, 2010.
2. J.B. Gupta, Theory and Performance of Electrical Machines, S.K. Kataria. & Sons, 2003.
3. M.G. Say, The Performance and design of A.C. Machines – Pitman.
4. Electrical Machinery, Dr.P.S Bimbhra.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR- I-SEMESTER
POWER ELECTRONICS

Instruction : 4 +1Periods/week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3030**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
1. To provide fundamentals of power semi – conductor devices and its applications in power electronics. 2. To impart the knowledge of turn – on and turn – off of various power semi – conductor switches. 3. To understand the operation and application of various power converters in power electronics. 4. To impart the knowledge of control techniques employed for switches in different types of converters.	A successful graduate will be able to 1. Categorize and compare various devices used in power electronics. 2. Analyze and select the appropriate converter for a given application. 3. Suggest suitable commutation, protection and control circuits for a given application. 4. Design power and control circuits for the required application with given specifications.

UNIT-I
Power Semiconductor Devices: Power diode, types of power diodes - general purpose diodes, fast recovery diodes and Schottky diodes, their Characteristics, Basic structure, working, steady state and switching characteristics of BJT, Power MOSFETs, IGBTs, SCRs and GTOs, two transistor analogy of SCR, comparison of BJT, MOSFET and IGBT, applications of power semi – conductor devices.

UNIT-II
Firing, Driver and Protection circuits: R, RC and UJT triggering circuits for SCR, triggering circuits for single phase bridge rectifier and choppers, driver circuits for MOSFET, IGBT and BJT, commutation methods of SCRs, protection of SCRs.

UNIT-III
AC – DC Converters: Principles of controlled rectification - study of $1-\varphi$ and $3-\varphi$ half and full controlled bridge rectifiers with R, R – L, R – L – E loads, effect of source inductances, dual converters - circulating current mode and circulating current free mode – control strategies.

UNIT-IV
DC – DC, DC to AC and Cyclo Converters: Classification of choppers – A, B, C, D and E, switching mode regulators – study of Buck, Boost and Buck-Boost regulators, Cuk regulators, single phase AC voltage controllers with R & RL loads, principle of operation of $1-\varphi$ bridge type cyclo converters & their applications.

UNIT-V

Inverters: Principle of operation of 1 – φ inverter, 3 – φ bridge inverters (180° and 120° modes), voltage control of inverters - single pulse width modulation, multiple pulse width modulation and sinusoidal pulse width modulation, comparison of voltage source inverters and current source inverters, elementary multilevel inverters.

Suggested Reading:

1. Singh, M.D and Khanchandani, K.B, – *Power Electronics*, Tata McGraw Hill, 2nd Edition, 2006.
2. Rashid, M.H – *Power Electronics: Devices, Circuits and Applications*. Pearson, 2003
3. Mohan, Undeland, Robbins, *Power Electronics – Converters, Applications and Design*, Wiley India Pvt Ltd, 2010.
4. Bimbra. P.S, *Power Electronics*, Third Edition, Khanna Publishers, 2012.

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR- I-SEMESTER

LINEAR INTEGRATED CIRCUITS

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3040**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
To impart fundamental concepts of linear and non-linear devices and circuits namely Operational Amplifier, Multivibrator, 555 timer, ADC, DAC conversion methods, voltage regulators and provide an overview on design of second order Filters for Linear IC applications.	1. Demonstrate an understanding of fundamentals of linear integrated circuits. 2. Analyze the various applications and circuits based on particular linear integrated circuit. 3. Select and use an appropriate linear integrated circuit to build a given application. 4. Analyze the non-linear circuit applications and design voltage regulators. Design an application with the use of linear integrated circuit.

UNIT-I

Operation amplifiers-Characteristics, open loop voltage gain, output impedance, input impedance, common mode rejection ratio – Offset balancing techniques – Slew rate, Frequency response - Stability, frequency compensation of Op-amp, basic applications – Inverter summer, analog integrator, differentiator, current to voltage converter, voltage to current converter, log -anti log amplifier, voltage follower, ac amplifier.

UNIT-II

Voltage limiter, clipper and clamper, precision rectifier- full wave and half wave, peak detector, comparator, zero crossing detector, Schmitt trigger, monostable, astable, bistable, multiplier, divider, difference amplifier, Instrumentation amplifier circuits using Op-amps.

UNIT-III

Waveform generation using op-amps-sine, Square, Triangular, Quadrature oscillators, voltage controlled oscillator/multi vibrator, voltage to frequency converter , 555 timer functional diagram, operation as monostable and astable. phase locked loop, A/D and D/A converters.

UNIT-IV

Series voltage regulator, shunt regulators, and switching regulators using OP-amp, dual voltage regulator, fixed voltage regulators, dual tracking regulators, current sensing and current feedback protection.

UNIT-V

RC active filters-low pass, high pass and band pass, band reject, notch, first order, second order transformation , state variable filter , switched capacitor filter , universal filter, Balanced modulator and demodulator

Suggested Reading:

1. D.Roy Choudhury, Linear Integrated Circuits, Shail B.Jain, 4th Edition, New Age International(P) Ltd., 2010.
2. R.A. Gayakwad, Op-Amps and Linear Integrated Circuits, 4th Edition, Prentice Hall of India, 2009.
3. Coughlin and Driscoll, Operational Amplifiers and Linear Integrated Circuits, 6th Edition, Prentice hall of India, 2003.
4. Malvino Albert Paul, Electronic Principles, 7th Edition, Tata McGraw Hill, 2006.
5. S. Franco, "Design with Operational Amplifiers and Analog Integrated Circuits", McGraw Hill Inc., 2002

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR- I-SEMESTER

LINEAR CONTROL SYSTEMS

Instruction: 4 +1 Periods/week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3050**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
Study the principles of system modeling, system analysis and feedback control, and use them to design and evaluate feedback control systems with desired performance; specifically, to acquire the related knowledge and techniques to meet the following course objectives: 1. *Control system modeling*: Modeling of electric, mechanical and electromechanical systems, using differential equations, transfer functions, block diagrams, and state variables; 2. *Control system analysis*: Analysis of properties of control systems, such as sensitivity, stability, controllability, tracking, in time and frequency domains; and 3. *Control system design*: design of feedback controllers, such as PID, lead and lag compen- sators, pole placement designs, to meet desired system performance specifications.	1. To model the electrical, mechanical and electromechanical systems using differential equations, transfer functions, block diagrams and state variables 2. To obtain the time and frequency response of systems and analyse them with respect to performance specifications 3. To analyze the stability, controllability and observability in time and frequency domains 4. To design the feedback controllers, such as PID, lead and lag compensators to meet the desired performance specifications 5. To analyze the stability, controllability and observability of digital control systems

UNIT – I

Open and Closed loop Systems**,** Continuous time and discrete time control systems, Control System components – Error sensing devices – Potentiometers. Synchros, AC – DC servo motors – Block diagram representation, Transfer function and impulse response – Signal flow graphs.

UNIT – II

Time Response: Types of Input, Transient response of second order system for step input. Time domain specifications – Types of system – static error coefficients, Error series – Routh-Hurwitz criterion of stability. Root Locus Technique – Typical systems analyzed by root locus technique – Effect of location of roots on system response, PID controller.

UNIT – III

Frequency Response Plots: Bode Plots, Frequency domain specifications. MP, WP for a second order system, Nyquist criterion for a stability, relative stability gain and phase margin, Compensation: Cascade compensation Using Bode Plots.

UNIT – IV

State Space Representation: Concept of state, State Variable, State Models of linear time invariant systems. Derivation for state models from transfer functions and differential equations. State transition matrix – solution of state equations by time domain method. Observability and controllability.

UNIT – V

Discrete Control Analysis: Introduction to signals and systems, the Z – transformation, digital control, advantages and disadvantages. Digital Control System Architecture. The discrete transfer function. Sample data system. Transfer function of sample data system – Z – Plane specifications of control system design. Z – domain stability.

Suggested Readings:

1. I.J. Nagrath, M. Gopal, Control System Engineering< new Age International (P) Limited publishers, 2007.
2. J. F. Franklin and J.D. Powell – Digital Control of Dynamic Systems, Addison Wesley.
3. M. Gopal, Control System Principles and Design – Tata Mc Graw Hill, 2nd edition, 2003.
4. K. Ogata, Modern Control Systems, 3rd Edition, PHI.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR- I-SEMESTER
FINISHING SCHOOL – TECHNICAL SKILLS

Instruction : 2 Periods /week	Sem. Exam Marks : 35	Subject Ref. Code : **EE3110**
Credits : 01	Sessional Marks: 15	Duration of Sem. Exam:1.5 Hrs.

Course objective:	Course Outcomes:
The course will enable the students to: The objective of the course is to explain efficient storage mechanisms for an easy access and design and implement various data structures and improve logical ability.	**At the end of the course student will be able to:** 1. identify different Object Oriented Concepts , define Algorithm , analyse the algorithm with different asymptotic notations ,Abstract data type 2. describe Stack and Queue , the different operations on stack and queue , their applications . 3. distinguish between arrays and Linked list , implement different operations performed on stacks and queues using linked list. 4. demonstrate and create different trees, operations on trees . 5. demonstrate and create different trees, operations on graphs and different sorting techniques

UNIT-I

Algorithm Specification, Performance Analysis and Measurement.

C++ Review, Abstract Data Types and the C++ Class, Array as an Abstract Data Type, Polynomial Abstract Data Type, Representation of Arrays, String Abstract Data Type.

UNIT-II

Stacks and Queues: Templates in C++, Stack Abstract Data Type, Queue Abstract Data type, Applications of Stacks and Queues.

UNIT-III

Linked Lists: Singly Linked Lists , Doubly Linked Lists. Linked Stacks and Queues, Polynomials

Applications of Linked Lists.

UNIT-IV

Trees: Introduction, Binary Trees, Binary Tree Traversal, Binary Search Trees.

Binary Search Trees: AVL Trees, Red-Black Trees, Splay Trees, m-way Search Trees, B-Trees.

UNIT-V

Graphs: Graph Abstract Data Type, Elementary Graph operations (dfs and bfs), Minimum Cost Spanning Trees

Sorting: Insertion sort, Quick sort, Merge sort, Heap sort.

Suggested Reading:

1. Ellis Horowitz, Dinesh Mehta, S. Sahani. Fundamentals of Data Structures in C++, Universities Press. 2007.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education 2006.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR- I-SEMESTER
FINISHING SCHOOL – SOFT SKILLS

Instruction: 2 Periods/week	Sessionals: 15 Marks	SEM Exam Marks:35 Marks
Credits:01	SEM Exam Duration: 1.5 Hrs	Subject Ref Code: HS 3110

Course Objective:	Course Outcomes
This is a foundation course and aims at enhancing employability skills in students. Students will be introduced to higher order thinking skills and problem solving on the following areas - Arithmetic ability, Numerical ability and General reasoning. Students will be trained to work systematically with speed and accuracy while problem solving. The three major areas covered in this course include 1. Numerical Ability 2. Arithmetic Ability 3. General reasoning	**At the end of the course students will be able to:** • Solve questions on the above mentioned areas using short cuts and smart methods • Understand the fundamentals concepts of Aptitude skills • Perform calculations with speed and accuracy

UNIT – I : QUANTITATIVE APTITUDE - NUMERICAL ABILITY

- Numerical Ability
- Introduction to higher order thinking skills
- Speed Maths
- Number systems
- LCM & HCF

UNIT – II: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION

- Arithmetic Ability
- Percentage
- Profit loss and discounts
- Ratio proportions Allegations and mixtures
- Averages

UNIT – III: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED

- Arithmetic Ability
- Time speed and distance
- Time and work
- Interest calculations

UNIT – IV: REASONING ABILITY – GENERAL REASONING PART 1

- General Reasoning
- Coding decoding
- Directions
- Series completions

UNIT – V: REASONING ABILITY- GENERAL REASONING PART 2

- General Reasoning
- Analogies
- Classification
- Alphabet test
- Mathematical operations

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR- I-SEMESTER

ELECTRICAL MACHINES LAB – I

Instruction : 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : **EE3031**
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
To expose the students to practical experiments of DC machines and single phase transformers.	1. Able to test the performance of various DC generators. 2. Able to test the performance of various DC motors. 3. 3. Able to test the performance of single phase transformers.

LIST OF EXPERIMENTS:

1. Magnetization characteristics and the speed Vs voltage curve of separately and self-excited D.C. generator
2. Load characteristics of D.C Shunt Generators
3. Load characteristics of D.C Compound generator
4. Performance characteristics of D.C Series Motor
5. Performance characteristics of D.C. shunt motor
6. Performance characteristics of D.C Compound motor
7. Separation of iron and friction losses and estimation of parameters in D.C. machines.
8. (a)Speed control of D.C. shunt motor by shunt field control and armature resistance control (b) Swinburn's Test
9. Separation of core losses in a Single Phase transformer
10. Open circuit and short circuit tests on a Single Phase transformer
11. Sumpner's test on two identical transformers
12. Estimation of efficiency of DC Machine by Hopkinson test.
13. Retardation Test , Dynamic Braking of DC Shunt Motors.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR- I-SEMESTER

CONTROL SYSTEM LABORATORY

Instruction : 3 Periods /week	Sem. Exam Marks : 50	Subject Ref. Code : **EE3041**
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
The objective of the lab is to provide an experience in working with various control system components and control systems for understanding analyzing them and also enhance the analyzing capability by introducing simulation tools for control systems.	A successful graduate will be able to 1. Obtain the characteristics of AC, DC servo motors and synchro pair 2. Obtain the characteristics of second order system and analyze the time domain specifications. 3. Understand AC and DC position control systems and analyze them. 4. Obtain the frequency response characteristics and design lead and lag compensators.

LIST OF EXPERIMENTS:

1. Characteristics of DC and AC Servo motors.
2. Characteristics of Synchro Pair .
3. Frequency response of compensating networks.
4. Step response of second order system.
5. DC position control system.
6. AC position control system.
7. Closed loop P, PI and PDI controller.
8. Step response and frequency response of a given plant.
9. Design of lag and lead compensation for the given plant.
10. ON/ OFF Temperature control system.
11. Temperature control system.
12. Level Control System.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR- I-SEMESTER

MINI PROJECT

Instruction : 3 Periods /week	Sessional Marks: 25
Credits : 2	Subject Ref. Code : **EE3051**

Course objective:	Course Outcomes:
The mini project is by far the most important part in the degree program. It provides an opportunity for students to demonstrate independence and originality, to plan and organise a large project over a long period, and to put into practice some of the techniques students have been taught throughout the course. It enables the students to acquire confidence at having conceptualized, designed, and implemented a working, medium sized project with their team .	1. Apply the knowledge acquired in the electrical engineering. 2. Demonstrate the ability to locate and use technical information from multiple sources. 3. Demonstrate the ability to communicate effectively through a technical report. 4. Demonstrate independent learning and professional ethics. 5. Demonstrate the project management capabilities. .

LIST OF EXPERIMENTS:

1. Design and winding of a two winding transformer.
2. Design and winding of a 3-phase Induction Motor.
3. Design and winding of a single phase capacitor start induction motor.
4. Design of a voltage stabilizer.
5. Design of choke.
6. Disassembly, repairing, assembly and testing of electrical devices.
7. Design of an inverter
8. Design and winding of three winding transformer
9. Design and winding of a stepper motor
10. Designing of relay coils for different PSM and TSM

Note:

- Students should choose any two from the above, execute and demonstrate.
- Students can also come out with innovative projects and after approval by the faculty; they should execute and demonstrate the project.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

B.E. III YEAR - II-SEMESTER

S.NO	Sub reference Code	Subject	Scheme of Instructions Periods per				Scheme of Examination			
							Duration in Hrs	Maximum Marks		Credits
			L	T	D	P		SEM Exam	Sessional	
THEORY										
1	EE 3060	Digital Signal Processing	4	-	-	-	3	70	30	3
2	EE 3070	Electrical Machinery - III	4	1	-	-	3	70	30	3
3	EE 3080	Switchgear and Protection	4	-	-	-	3	70	30	3
4	EE 3090	Microprocessors and Microcontrollers	4	-	-	-	3	70	30	3
5	EE 3100	Electric Drives and Static Control	4	-	-	-	3	70	30	3
6	EE 3120	Finishing School- IV: Technical Skills	2	-	-	-	1.5	35	15	1
7	HS 3210	Finishing School -IV: Soft Skills	2	-	-	-	1.5	35	15	1
8	HS 3140	Human Values and Professional Ethics - II	2	-	-	-	1.5	70	30	1
PRACTICALS										
9	EE 3061	Electrical Machines Lab – II	-	-	-	3	3	50	25	2
10	EE 3071	Power Electronics Lab	-	-	-	3	3	50	25	2
11	EE 3081	IC Lab	-	-	-	3	3	50	25	2
		TOTAL	**26**	**1**	**-**	**9**	**-**	**640**	**285**	**24**
		GRAND TOTAL	**36**					**875**		

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

DIGITAL SIGNAL PROCESSING

Instruction: 4 Periods /week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3060**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
This course will introduce the basic concepts and techniques for processing digital signals. By the end of the course, students will be familiar with the most important methods used in DSP applications, including digital filter design, transform-domain processing and importance of Signal Processors. The course emphasizes intuitive understanding and practical implementations of the theoretical concepts.	After completing the course the student will be able to: 1. Understand the basics and significance of Digital Signal Processing and its applications. 2. Analyze the digital systems using Discrete Fourier Transforms and Fast Fourier transforms. 3. Apply Z transforms to digital systems and realize digital filters. 4. Design IIR filter using Butterworth or Chebychev analog filters and then transform them to digital filters. 5. Design FIR filters using various window techniques. Also understand the basic architecture of DSP processor.

UNIT–I:

Introduction to Digital Signal Processing: Classification of signals & Systems-properties of Discrete system- Linear shift-invariant systems, stability and causality, Sampling of Continuous Signals-Signal Reconstruction, quantizing & encoding, Linear constant co-efficient difference equations. Applications of DSP.

UNIT-II:

Fourier Analysis: Discrete Fourier series, Discrete Fourier transform, Phase and amplitude spectra, Properties of Discrete Fourier Transform. Linear convolution of sequence using DFT, Circular convolution overlap save method and overlap add method- Fast Fourier Transform- Radix-2 decimitation-in- time and decimitation-in-frequency FFT algorithms, Inverse FFT.

UNIT-III:

Z-Transform.: Properties of z transform, Applications of z-transforms for solution of difference equations of digital filters system function, stability criterion, Realization of filters – direct, canonic. Cascade and parallel form.

UNIT-IV:

Introduction to digital filters-types of filters-IIR Filters- Design of Butterworth, chebyshev filters, IIR filter design by impulse invariance and bilinear transformation.

FIR Filters: Design and Characteristics of FIR Digital Filters. Frequency response, Window Techniques– Rectangular window, Hamming window, Bartlet window, Kaiser window.

UNIT- V:

Introduction to TMS320LF2407 DSP Controller: Basic architecture features – physical memory – software tools.

General Purpose Input Output (GPIO): Pin multiplexing and general purpose I/O overview – Multiplexing – General purpose I/O control registers.

SUGGESTED READINGS:

1. Digital Signal Processing: Principles, Algorithms, and Applications by John G Proakis, 4th Edition 2007
2. P. Venkata Ramani, Bhaskar," Digital Signal Processor, Architecture, Programming & Application", TataMcGrawHill-2004
3. Avtar Singh, S.Srinivasan, "Digital Signal Processing", Thomson Publications, 2004.
4. Hamid A. Tolyat "DSP based electro mechanical motion control, CRC Press 2003
5. Oppenheim AV, and Schafer R.W.Digtal Signal Processing – Prentice Hall Inc.1975.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

ELECTRICAL MACHINERY – III

Instruction:4 +1Periods /week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3070**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
The aim of this course is: 1. To describe an overview of constructional details and types of windings of synchronous machine, 2. To contrast different methods of finding voltage regulation of synchronous generator. 3. To explain the principle of operation of synchronous motor, starting methods and analyze their performance characteristics 4. To analyze the transient stability of synchronous machine connected to infinite Bus. 5. To discuss different single phase motors, special motors and analyze their performance characteristics.	The student will be able to: 1. Distinguish various parts and types of windings of synchronous machine 2. Identify suitable method to find voltage regulation and also calculate the regulation of Synchronous generator. 3. Demonstrate the principle of operation of synchronous motor and their operating characteristics. 4. Explain transient behaviour and stability of synchronous machine connected to infinite Bus. 5. Choose suitable single phase induction motor for various applications.

UNIT–I:

Synchronous Machines**:** Constructional details, Types of windings – Winding factors – e.m.f. equation – Fractional pitch and fractional slot windings – Suppression of harmonics and tooth ripple – Armature reaction and reactance – Synchronous impedance.

UNIT-II:

Synchronous Generator: Voltage regulation – Phasor diagram of alternator with non-salient poles – O.C. and S.C. characteristics – Synchronous impedance, Ampere turn, ZPF methods for finding voltage regulation – Principle of two reaction theory and its application for the salient pole synchronous machine analysis – Synchronizing and parallel operation.

UNIT-III:

Synchronous Motor: Theory of operation – Vector diagram – Variation of current and p.f. with excitation – Hunting and its prevention – Power angle characteristics – Slip test – Current and power diagram –Predetermination of performance-Methods of starting and synchronizing. Synchronizing power .Synchronous condenser.

UNIT-IV:

Transient Stability Studies of Synchronous Machines: Elementary ideas of transient behaviour of an alternator – Three phase short circuit of an alternator - Elementary ideas of the stability of synchronous machine connected to infinite Bus. Special machines - Permanent magnet motors, Switched reluctance motors, Hysteresis motors.

UNIT- V:

Two phase servo motor characteristics – Single phase motors – Theory and operation of single phase motors – Shaded pole, split phase and capacitor motors – Compensated and uncompensated series and repulsion motors. Linear induction motors.

Suggested Reading:

1. M.G. Say, The Performance and Design of A.C. Machines – Pitman Publications.
2. I.J. Nagrath & D.P. Kothari, Electrical Machines, Tata McGraw Hill.
3. P.S. Bhimbra, Generalized Theory of Electrical Machines, Khanna Publications.
4. Electrical Machinery, Dr.P.S Bimbhra.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

SWITCHGEAR AND PROTECTION

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3080**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
1. To analyze principles of operation of the different types of electromagnetic relays. 2. To comprehend principles and operation of static, microprocessor and distance relays. 3. To comprehend the different principles of protective schemes in power system and power apparatus. 4. To comprehend the principles of operation of the different types of circuit breakers. 5. To be acquainted with different lightning arrestors for the protection of the various equipments of power system.	At the end of the course the student will be able to: 1. calculate parameters of relay operations, analyze the principles of operation of various electromagnetic relays, derive the characteristics and apply for protection of transmission lines. 2. analyze the characteristics of dual input comparators, static relays and microprocessor based relays and distance relays. 3. apply the knowledge of different principles of relays for equipment protection like alternators, transformers, bus bars etc. 4. comprehend, analyze the concepts of circuit interruption and perform calculations on restriking voltage, recovery voltage, RRRV etc. 5. comprehend Analyze and apply the knowledge of different types of lightning arrestors, surge absorbers and design of ground wire, insulation coordination for various over voltage applications.

UNIT – I

Introduction to protective relays: Need for protection – primary protection – backup protection – zones of protection – Definitions of relays pickup, Dropout and reset values, Classification of relays, operating principles and construction of Electromagnetic and induction relays, Over current, Over voltage and Power relays. Directional features – Universal relay torque equation. Over current protection for radial feeders and ring mains, Protection of parallel lines, Relay settings for over current relays, Earth fault and phase fault protection.

UNIT – II

Static phase and Amplitude comparators: Characteristics of dual input comparators. Distance protection – 3 steps distance relays, Characteristics of distance relays on RX Diagram – Static over current relay, Microprocessor based over current relaying (block diagram), need for numerical relays, advantages and functional block diagram of numerical relay.

UNIT – III

Transformer and generator protection: Differential relays – percentage differential relays – protection of generator and transformer using percentage differential relays – split phase, interturn protection, overheating, loss of excitation, protection of generators – Protection of transformers against magnetizing in rush – Bucholz relays – Protection of earthing transformers – Generator transformer unit protection.

UNIT – IV

Circuit breakers: Need for circuit breakers – arc properties – principles of are quenching, Theorics, Recovery and restriking voltages, Definitions in Circuit breakers, rated symmetrical and asymmetrical breaking current – rated making current – rated capacity, voltage and frequency of circuit breakers , Auto reclosure, Duty cycle, Current chopping – resistance switching – derivations of RRRV – Maximum RRRV etc., Circuit breaker calculations – types of circuit breakers – Bulk oil, Minimum oil, air, air blast, SF6 and vacuum circuit breakers, testing of circuit breakers.

UNIT – V

Over voltage protection: Protection of transmission lines against direct lightening strokes – ground wires – protection angle – protection zones – height of ground wire – conductor clearances – conductor heights – tower footing resistance and its effects – Equipment protection assuming rod gaps, arcing horns, different types of lightening arrestors – their construction – surge absorbers – Peterson coil – insulation co-ordination.

Suggested Reading:

1. Badriram, Viswakarma, Power System Protection and Switchgear, Tata McGraw Hill, 2011.
2. C.L. Wadhwa, Electrical Power system, Wiley Eastern Ltd. 2nd Edition, 2010.
3. Sunil S.Rao, Switchgear and Protection, Khanna Publications.
4. B. Ravindranath & M.Chander, Power Systems Protection & Switchgear, New Age International, Special Indian Edition.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

MICROPROCESSORS AND MICROCONTROLLERS

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3090**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
. To understand the architecture, operation, and addressing modes of Intel 8086 microprocessor and 8051 Microcontroller. . To Study the instruction set and programming of 8086MP and 8051 MC. . To understand memory interfacing and various interfacing circuits for various applications.	Will be able to 1. Describe the architecture of 8086 microprocessors and 8051 Microcontroller. 2. Identify and analyze different types of addressing modes and instruction set of 8086 MP and 8051 MC. 3. Write assembly language programs for various applications using instructions and assembler directives of 8086 MP and using instructions of 8051 MC. 4. Compare and contrast macros with subroutines. 5. Interface the microprocessor and microcontroller with memory and I/O devices. And Configure, program and deal with software and hardware interrupts.

UNIT - I

Over view of microcomputer structure and operation - Microprocessor Architecture of 8086- Segmented memory, Addressing modes, Instruction set, Minimum and Maximum mode operations.

UNIT-II

Construction of machine codes for MOVE 8086 instruction - Assembly language Programming, Assembler directives, simple programs using Assembler, strings, procedures, Macros, timing.

UNIT- III

Memory and I/O interfacing, A/D and D/A interfacing, 8255 (PPI), programmable Interval Timer (8253), Keyboard and display interface, interrupts of 8086, Seven segment display, 8257 DMA controller, 8251 USART

UNIT - IV

Microcontrollers - 8051 microcontroller, Architecture, I/O ports, connecting external memory, Instruction set, Assembly language programming.

UNIT - V

Interrupts programming concepts with examples, Serial communication programming concepts with examples, Timers, Counters, Applications of micro controllers interfacing LEDs, Seven Segment display, Keyboard Interfacing, LCD interfacing, Stepper motor interfacing.

Suggested Reading:

1. Douglas.V.Hall-Microprocessors and Interfacing-Rara Mcgraw Hill-Revised 2nd edition, 2006.
2. Krishna Kant – Microprocessors and Microcontrollers – Architecture, Programming and System Design 8085, 8086 8051, 80996, Prentice-Hall India-2007.
3. Kenneth.J.Ayala _ "the 8051 , Microprocessors Architecture , Programming and Application, Thomson publishers, 2nd edition.
4. Walter A. TRiebel & Avatar Singh- The 8088 and 8086 Microprocessor – Fourth Edition, Pearson.
5. Muhammed Ali Mazid, Janie Gillispe, Rolin D Mckinby, The 8051 Microcontroller and Embedded Systems using Assembly and C, 2nd Ed, Pearson.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

ELECTRIC DRIVES AND STATIC CONTROL

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : **EE3100**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
1. To introduce the principle and working of speed control of DC motor by using single phase full controlled and half controlled rectifier.	1. Modify the speed torque characteristics of DC and Induction motors
2. To familiarize the students with the Four-quadrant operation of DC motor and Electric braking.	2. Apply Electric braking techniques to DC and Induction Machines
3. To develop and understanding of various Chopper controlled DC drives.	3. Select an appropriate speed control for DC motor drive to meet the requirements of application in Industry.
4. To familiarize the students with the speed control of Induction motor from stator and rotor side.	4. Choose an appropriate speed control for Induction motor drive to meet the requirements of application in Industry.
5. To develop and understanding the principle of speed control of Synchronous motor, BLDC and SRM.	5. Select an appropriate speed control for Synchronous motor, BLDC and SRM drive to meet the requirements of application in Industry.

UNIT-I

Electric Drives: Concept and classification, Dynamics of Electric Drives, Types of
Loads, Torque characteristics of Load, characteristics of Motor-Load combination,
Dynamics of Motor-Load combination, Steady-state and Transient stability of Electric
Drive. Characteristics of Electric Drives: Modified Speed-Torque Characteristics of D.C
Shunt motors, D.C Series motor and Induction motors.

UNIT-II

Starting of Electric Motors: Methods of Starting Electric Motors, Acceleration time,
Energy relation during starting, D.C Shunt and series Motor and Induction motors,
Methods to reduce the energy loss during starting.

Electric Braking: Types of Braking, Regenerative Braking Dynamic Braking and plugging, Braking of DC shunt motor, DC series motor and 3-Phase induction motor, Energy relation and dynamics of breaking, effect of load inertia and load equalization.

UNIT-III

D.C motor control: Single-phase controlled rectifier and chopper circuit arrangement for continuous armature current operation. Dual converter control, Circulating current and non-circulating current modes of operation, Principles of closed loop control for D.C drives.

UNIT-IV

Induction motor control: Speed control of 3-phase induction motor with A.C voltage
regulators, Voltage source inverters and Cyclo-converters, Static rotor resistance control, slip power recovery schemes: Static Krammer drive and Scherbius drive.

UNIT-V

Synchronous motor control: Self-controlled and separately controlled synchronous
motors, Brushless D.C motors, Switched reluctance motors.

Suggested Reading:

1. S.K.Pillai, A First Course in Electrical Drives, New Age International, 2000.
2. GK.Dubey, Fundamentals of Electric Drives, Narosa Public House, Delhi, 2001.
3. M.D. Singh and K.B.Khanchandani, Power Electronics, Tata McGraw Hill Publishing Company Ltd., 2000.
4. Bimal.K.Bose, Modern Power Electronics and AC Drives, Pearson Education Asia, 2002.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR-II-SEMESTER
FINISHING SCHOOL IV: TECHNICAL SKILLS

Instruction : 2 Periods / week	Sem. Exam Marks : 35	Subject Ref. Code : EE3120
Credits : 1	Sessional Marks: 15	Duration of Sem. Exam : 1.5 Hrs

Course objective:	Course Outcomes:
The course will enable the students to: The objective of the course is to create Java Programs by using object-oriented features and implement error-handling techniques using exception handling, and to explain the need of database for storing, accessing and updating the data, eliminate the redundant data.	**At the end of the course student will be able to:** 1. demonstrate the principles of the object oriented programming. 2. create packages. handle errors using Exception Handling, and create threads using Multithreaded Programming concepts. 3. apply the concepts of classes present in lang, IO package. 4. identify the purpose of different database languages and data models 5. explain the operations of relational model using SQL

UNIT – I

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control statements, Classes, Methods, Inheritance

UNIT- II

Packages and Interfaces, Exception Handling, Multithreaded Programming,

UNIT- III

I/O basics, Reading console input and output, Reading and Writing Files, String Handling.

Exploring Java Language, Collections Overview, Collections Interfaces, Collections Classes.

UNIT - IV

Introduction: Overview, File System vs DBMS, Advantages of DBMS, Database System Applications, Relational Databases, Object – Based and Semi-structured Databases, Data Storage and Querying, Database Architecture, Database Users and Administrators.

Database Design and the E-R Model: Overview of the Design Process, the E-R Model, Constraints, E-R Diagrams, E–R Design Issues, Weak Entity Sets, Extended E-R Features, Reduction to Relational Schemas, Other Aspects of Database Design.

UNIT – V

Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra Operations, Additional Relational – Algebra Operations, Extended Relational - Algebra Operations, Null Values, Modification of the Databases.

Structured Query Language: Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex Queries, Views, Modification of the Database, Joined Relations.

Suggested Reading:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
2. Abraham Silberschatz, Henry F Korth, S. Sudarshan, Database System Concepts, Sixth Edition, McGrah-Hill International Edition, 2010.
3. Ramakrishnan, Gehrke, Database Management Systems, Third Edition, McGrah-Hill International Edition, 2003.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

FINISHING SCHOOL IV: SOFT SKILLS

Instruction : 2 Periods /week	Sem. Exam Marks : 35	Subject Ref. Code : HS3210
Credits : 1	Sessional Marks: 15	Duration of Sem. Exam : 1.5 Hrs

Course Objective:	Course Outcomes
This course aims at enhancing the employability skills. Students will be trained in higher order thinking skills including analytical skills, problem solving skills and critical & logical reasoning skills. Students will be trained to work systematically and develop logical and analytical thinking. Students will be trained in the following areas 1. Critical and Non verbal reasoning 2. Pure Maths 3. Verbal ability 4. Logical reasoning 5. Data Interpretation and Analysis	**At the end of the course students will be able to:** • Understand the fundamentals concepts of Aptitude and verbal skills • Solve questions using short cuts and smart methods • Perform calculations with speed and accuracy • Develop Analytical thinking and problem solving skills

UNIT 1 VERBAL ABILITY

- Finding errors
- Vocabulary
- Synonyms
- Antonyms
- Idioms and Phrases
- Fill in the blanks and sentence Jumbles
- Reading comprehension

UNIT 2 LOGICAL REASONING

- Logical Reasoning
- Assignments
- Puzzles
- Blood relations
- Syllogisms

UNIT 3 CRITICAL AND NON VERBAL REASONING

- Critical Reasoning
- Non verbal reasoning
- Figure series and completions

UNIT 4 QUANTITATIVE APTITUDE - PURE MATHS

- Pure maths
- Algebra
- Probability
- Permutations and combinations

UNIT 5 DATA INTERPRETATION AND ANALYSIS

- Data Interpretation
- Line graph
- Pie chart
- Tabulation

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DEPARTMENT OF MECHANICAL ENGINEERING
SYLLABUS FOR B.E. 3/4 II-SEMESTER
HUMAN VALUES AND PROFESSIONAL ETHICS-II

Instruction :2 Periods /week	Sem. Exam Marks :70	Subject Ref. Code: HS 3140
Credits : 1	Sessional Marks :30	Duration of Sem. Exam :3 Hrs

Course objectives	Course Out comes
The course will enable the students to:	At the end of this course the student will be able to:
• Get a holistic perspective of value-based education. • Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations. • Understand professionalism in harmony with self and society. • Develop ethical human conduct and professional competence. • Enrich their interactions with the world around, both professional and personal.	• Gain a world view of the self, the society and the profession. • Make informed decisions. • Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals • Inculcate Human values into their profession. • Validate their aspirations through right understanding of human relationship and see the co-relation between the human values and prevailing problems. • Strike a balance between physical, mental, emotional and spiritual parts their being. • Obtain a holistic vision about value-based education and professional ethics.

UNIT-I

A. DISTINCTION BETWEEN NEED AND GREED

Exercising the wisdom to distinguish need from greed.

B. IDEAL SELF-REAL SELF

How to define the ideal-idealism at various levels- is it possible to reach idealism –Man as a pilgrim on a journey to idealism.

UNIT-II

A. RIGHTS AND RESPONSIBILITIES

Educating an individual about rights and responsibilities –Safeguards-Stimulants- Social Justice-The three catalysts for deciding rights and responsibilities.

B. IMBIBING AND INCULCATING CIVIC SENSE AND CIVIC-VIRTUES

The true meaning of Integrity -Honesty, Humility, Openness, Transparency, Dedication, Reliability, Confidentiality, accountability, Collegiality, Sympathy, Trustworthiness, Co-operation, Courage.

a. The moral dilemma of the Modern world, Respect for Self, Others and Work.
b. Respect for women at all times especially at the workplace.

UNIT-III: MANAGING FAILURE

Identifying causes for failure and learning lessons-Using failure to score success-Role of self- confidence and personal ethics in coping with failure.

• Anger/ Depression • Fear • Agitation • Failure • Lethargy • Dishonesty	• Cruelty • Jealousy • Desire • Cheating • Pride • Greed • Lying

UNIT-IV : STRESS MANAGEMENT

Identifying sources and levels of stress –Tackling stress and its associated Negativity-Positive aspect of coping with stress- Some techniques to manage stress.

UNIT-V: DEVELOPING EMOTIONAL INTELLIGENCE

Self-Awareness
Handling Emotions
Motivation
Empathy
Social skills

Learning Resources

1. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
2. A.N Tripathy, 2003 Human values, New Age International Publishers.
3. EG Seebauer & Robert L. Berry,2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. Mike Martin and Ronald Schinzinger "Ethics in Engineering "McGraw Hill
5. Charles E Haris, Micheal J Rabins, " Engineering Ethics "Cengage Learning
6. Caroline whitback, Ethics in Engineering Practice and Research, Cambridge University Press
7. Georgs Reynolds, Ethics in Information Technology", Cengage Learning
8. Charles D. Fleddermann, " Engineering Ethics", Pearson Education, New Jersey,2004 (Indian Reprint)

Online Resources

1. Value Education website, Http://www.universalhumanvalues.info
2. UPTU webiste, Http://www.uptu.ac.in
3. story of stuff, Http://www.storyofstuff.com
4. AlGore, As Inconvenient Truth, Paramount Classics, USA
5. Charlie Chaplin, Modern Times, United Artists, USA
6. IIT Delhi, Modern Technology-The Untold story
7. Anand Gandhi, Right Here Right Now, Cyclewala production

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR-II-SEMESTER
ELECTRICAL MACHINES LAB – II

Instruction : 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : **EE3061**
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
The main objective of the course is to give the students an insight into the constructional details of the induction and synchronous machines with a view of better understanding of their working principles. The course also equips the students to test and evaluate the performance of induction and synchronous machines by conducting appropriate experiments.	1. Estimate or test the performance of induction and synchronous machines by conducting suitable experiments and report the results. 2. Predetermine the voltage regulation of Non salient and Salient Alternators by conducting suitable tests. 3. Evaluate the various characteristics of ac machines by conducting suitable experiments. 4. Communicate effectively and support constructively towards team work. 5. Pursue lifelong learning for career and professional growth with ethical concern for society and environment.

LIST OF EXPERIMENTS:

1. Three phase to Two phase conversion (Scott Connection)
2. Heat run test on Three phase transformer.
3. No-load test, blocked rotor test and load test on 3-phase Induction motor.
4. Speed control of three phase induction motor by
   (a) Cascade connection
   (b) Stator Voltage control method
   (c) Rotor impedance control
   (d) Pole changing
   (e) Rotor slip recovery – Kramer drive
   (f) V/F Control
5. Performance characteristics of single phase induction motor.
6. Voltage regulation of Alternator by
   a. Synchronous impedance method
   b. Ampere – turn method
   c. Z.P.F. method.
7. Regulation of Alternator by slip test.
8. Determination of V curves and inverted V curves of Synchronous motor.
9. Power angle characteristics of a Synchronous motor.
10. Load characteristics of Induction Generator.
11. P.F. improvement of Induction motor using capacitors.
12. Synchronization of Alternator using three dark lamp method

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. III YEAR-II-SEMESTER
POWER ELECTRONICS LAB

Instruction : 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : **EE3071**
Credits : 3	Sessional Marks: 22	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
The objective of the lab is to provide an experience in working with power converters and enhance the analyzing capability by introducing simulation tools for power converters.	A successful graduate will be able to 1. Obtain the characteristics of power electronic devices. 2. Operate power electronic converters for any given application. 3. Apply the knowledge of power converters to operate electrical machines as drives. 4. Develop power electronic converter models using software.

List of experiments:

1. Characteristics of SCR, power BJT, MOSFET and IGBT
2. Gate trigging circuit for devices (SCR, BJT, MOSFET and IGBT) using R, R – C and UJT's and IC's
3. 1 – Ø AC voltage controller with R & R – L loads
4. 1 – Ø step down cyclo – converter with R & R – L loads
5. Study of forced commutation techniques
6. Two quadrant D.C drive
7. Buck – boost choppers
8. 1 – Ø bridge rectifiers: half and full control with R & R – L loads
9. Study of UPS & SMPS
10. V/f control of A.C drive
11. Simulation of 1-Ø full & semi converter
12. Simulation of 1-Ø & 3-Ø inverter

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. III YEAR-II-SEMESTER

INTEGRATED CIRCUITS LAB

Instruction : 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : **EE3081**
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
To acquire skills of designing and testing of digital and analog integrated circuits.	Students will be able to 1. Analyze and design various applications of Op-Amp. 2. Construct and troubleshoot circuits containing linear integrated circuits. 3. Design combinational and sequential logic circuits using IC's.

List of Experiments.:

1. Generation of Triangle and square wave using 741op-amp.
2. PLL (Phase locked loop).
3. Design of Astable multivibrator using 555 timer.
4. Active filters.
5. Instrumentation amplifier using 741 op-amp.
6. Design of integrator and differentiator using op-amp.
7. Multiplexer applications for logic Realization of combinational circuits.
8. synchronous counters.
9. Asynchronous counters.
10. Study of clipping and clamping circuits using op-amps
11. Design of monostable multivibrator.
12. Boot-strap sweep circuit using op-amp.
13. Study of half adder, full adder and half and full subtractor and realization of combinational logic.
14. A/D converters.
15. D/A converters.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ALMANAC FOR B.E - II & III year - I Semester [all branches]

S.No.	Particulars	Date
1	Commencement of Instruction	11-07-2016
2	I Class Test	29-08-2016 to 01-09-2016
3	II Class Test	26-10-2016 to 29-10-2016
4	Last date of Instruction	29-10-2016
5	Preparation holidays & Practical Examinations	31-10-2016 to 12-11-2016
6	Commencement of Theory Examinations	14-11-2016

ALMANAC FOR B.E - II & III year - II Semester [all branches]

S.No.	Particulars	Date
1	Commencement of Instruction	26-12-2016
2	I Class Test	13-02-2017 to 16-02-2017
3	II Class Test	11-04-2017 to 15-04-2017
4	Last date of instruction	15-04-2017
5	Preparation holidays & practical Examinations	17-04-2017 to 29-04-2017
6	Commencement of Theory Examinations	01-05-2017
7	Summer vacation	01-05-2017 to 08-07-2017
8	Commencement of I Semester for the Academic year 2017-2018	10-07-2017

E - JOURNALS & E-BOOKS SUBSCRIBED	
ASCE	35
ASME	27
IEEE ASPP	155
ACM Digital Library	1138
Springer Mechanical	49
Total GIST E-Journals	1405
DELNET CONSORTIUM (IESTC E-Journals -2016)	1152
DELNET E-Journals	817
Total e-journals	3374
DELNET MEMBERSHIP E-Books	335
Journals and magazines Print version	106