Chhattisgarh Swami Vivekanand Technical University
Bhilai (C.G.)

SCHEME OF TEACHING AND EXAMINATION
B.E. V SEMESTER ELECTRICAL ENGINEERING

S. No.	Board of Studies	Subject Code	Subject	Periods per week			Scheme of Exam Theory/ Practical			Total Marks	Credit L+(T+P) /2
				L	T	P	ESE	CT	TA		
1	Electrical Engg.	**324551(24)**	Electrical Machines-II	4	1	-	80	20	20	120	5
2	Electrical Engg.	**324552(24)**	Microprocessor & Interfacing	3	1	-	80	20	20	120	4
3	Electrical Engg.	**324553(24)**	Applied Numerical Analysis	3	1	-	80	20	20	120	4
4	Electrical Engg.	**324554(24)**	Integrated Circuits	3	1	-	80	20	20	120	4
5	Electrical Engg.	**324555(24)**	Control System Engg.	3	1	-	80	20	20	120	4
6	Electrical Engg	**324556(24)**	Communication Theory	3	1	-	80	20	20	120	4
7	Electrical Engg.	**324561(24)**	Electrical Machines-II Lab	-	-	3	40	-	20	60	2
8	Electrical Engg.	**324562(24)**	Microprocessor & Interfacing Lab	-	-	3	40	-	20	60	2
9	Electrical Engg.	**324563(24)**	Control System Engg. Lab	-	-	3	40	-	20	60	2
10	Electrical Engg.	**324564(24)**	Mini Project	-	-	3	40	-	20	60	2
11	Humanities etc.	**300565(46)**	Personality Development	-	-	2	-	-	20	20	1
12	Electrical Engg.	**324566(24)**	*Practical Training Evaluation / Library/Industry Institute Interaction	-	-	1	-	-	20	20	1
Total				**19**	**6**	**15**	**640**	**120**	**240**	**1000**	**35**

L: Lecture **T:** Tutorial **P:** Practical
ESE: End Semester Examination **CT:** Class Test **TA:** Teacher's Assessment

**** Industrial Training of eight weeks is mandatory for B.E. student. It is to be completed in two parts. The first part will be in summer after IV semester after which students have to submit a training report which will be evaluated by the college teachers during B.E. V semester.***

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Electrical Machines – II**	Code:	**324551(24)**
Total Theory Periods:	**48**	Total Tutorial Periods:	**12**
No. of class Tests to be conducted:	**2 (Minimum)**	No. of assignments to be submitted:	**2 (Minimum)**
ESE Duration:	**Three Hours**	Maximum Marks in ESE: **80**	Minimum Marks in ESE: **28**

Course Objective

The objective of this course is to provide knowledge about the fundamental of magnetic circuits, energy, force and torque of singly and multi-excited systems. This course is also to expose the students to basic principles, construction and working of synchronous and three –phase induction machins. The aim of this course is to give the knowledge of the equivalent circuits, parameter determination, operational constraints, starting mechanisms, conventional speed control methods, various tests and applications of synchronous and induction machines.

Course Outcomes

At the end of this course the student will be able to:

- Understand the energy, force and torque of single and multi-excited systems.
- Understand the construction, working principles of synchronous and three-phase induction machines
- Draw the equivalent circuit diagrams under various load conditions
- Analyze the load profile, voltage regulations and efficiency in various operating conditions
- Understand the needs and requirements of various types of machine operations like starting, speed control, tests etc.

UNIT I **Electrical Machines Principles:** Principle of electromechanical energy conversion singly excited magnetic system, co-energy and field energy, doubly excited magnetic system, MMF of concentrated and distributed windings, EMF equation, winding factors, rotating magnetic fields, torque production in synchronous and induction machines.

UNIT II **Synchronous Machines I:**Theory of non-salient pole synchronous machines, basic synchronous machine models, equivalent circuit and phasor diagrams of synchronous machines, saturation effects, armature reaction, open circuit, short circuit and ZPF lag tests on synchronous machines, synchronous reactance, SCR, voltage regulation of alternators by synchronous impedance, MMF and ZPF method, excitation systems of alternators, active and reactive power flows, Steady state power angle characteristics.

UNIT III **Synchronous Machines II:** Parallel operation of synchronous machines, load sharing, operation of synchronous machines with infinite bus bars, effect of excitation and prime mover input, synchronizing torque, V-curves.
Salient pole synchronous machine: Theory of salient pole synchronous machines, two-reaction theory, phasor diagram, power angle characteristics, determination of Xd and Xq, stiffness of coupling synchronous motors, phasor diagrams, starting of synchronous machines.

UNIT IV **Three-phase Induction Machines-I:** Introduction, construction (Cage and slip-ring induction motors), principle of operation, equivalent circuit, phasor diagram, power across air-gap, torque and power output, torque-speed (slip) relationship, loss and efficiency estimation, No-load and block rotor test, circle diagram.

UNIT V **Three-phase Induction Machines-II :** Methods of starting of Induction motor-reactance, autotransformer, star-delta, Speed control of induction motor (rotor resistance control, stator voltage and frequency control, v/f control), cogging and crawling, double cage induction motors.

Text Books:

1. Electric Machines, Nagrath& Kothari, TMH Publications,
2. Electrical machines , B. R, Gupta,, New Age International,

Reference Books:

1. Electrical Machinery, P. S. Bimbhra, Khanna Publishers,
2. Performance and design of AC machines ,M.G. Say, CBS Publication.
3. Electric Machines , P.K. Mukherjee & S. Chakravarti , DhanpatRai Publication

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Microprocessor & Interfacing**	Code:	**324552(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**12**
No. of class Tests to be conducted:	**2 (Minimum)**	No. of assignments to be submitted:	**2 (Minimum)**
ESE Duration:	**Three Hours**	Maximum Marks in ESE: **80**	Minimum Marks in ESE: **28**

Course Objectives

The objective of this course is to provide knowledge about the fundamentals of Microprocessors their evolution internal architecture and construction. This course is also useful to provide the knowledge of various supporting chips provided with the Microprocessor 8085. The aim of this course is to give the knowledge of various instructions, basic programming with Microprocessors 8085, data transfer schemes, Instruction format and addressing modes.

Course Outcomes: At the end of this course the student will be able to:

- Understand the basic architecture of Microprocessor 8085.
- Understand various instructions and their application in programming.
- Understand memory organization and mapping

UNIT I **Microprocessor Architecture:** Brief Introduction to Microprocessors, Architecture of 8085, Pin Configuration and their Function; internal registers & flag register, memory-stack organization, Generation of Control Signals, de-multiplexing of address / data bus, Instruction Fetch Cycle, Execute Cycle, Instruction Cycle.

UNIT II **Instruction Set and Programming with 8085:** Instruction for Data Transfer, Arithmetic, Logical Operations and Branching Operation. Stacks, Subroutine and Related Instructions. Elementary Concept of Timing Diagram and Machine Cycle. Addressing Modes, Instructions Format. Looping and Counting, Software Counters with Time Delays. Simple Programs using Instruction Set of 8085 like Program for Addition/ Subtraction/ Multiplication and Division of Unsigned Binary Numbers. Programs for Code Conversion e.g. BCD to Binary/ Binary to BCD, Binary to Seven-Segment LED Display, Binary to ASCII/ ASCII to Binary.

UNIT III **Data Transfer and Device Selection:** Format of Data Transfer, Modes of Data Transfer, Type of I/O Addressing, Condition of Data Transfer: Microprocessor Controlled Data Transfer/ Peripheral Controlled Data Transfer, Absolute and Linear Select Decoding, Memory and I/O Interfacing, Use of Decoders Selection, Memory Mapping.

UNIT IV **Interrupts:** Restart Instruction; Hardware Implementation, Interrupt Processing; Multiple Interrupts and Priority Concepts, Interrupt Structure of 8085, Instructions related to interrupts, Pending Interrupts, Application of Interrupts and simple illustrative Programs.

UNIT V **Architecture of Peripheral Interfacing Devices :** Architecture, Pin Diagram and functioning of 8155/8156 (RAM), 8255 (PPI). Simple programs like Initialization and I/O operations of the ports using simple I/O mode, Timer operation of 8155. Architecture, Pin diagram & description of USART (8251).Programmable Interval Timer 8253/8254: Block Diagram, Pin Configuration, Modes, Initialization Instruction, Interfacing and Simple Programs to generate various types of signals.

Name of Text Books:

1. Microprocessor Architecture, Programming and Application by R. S. Gaonkar, Wiley Eastern
2. Digital Systems – From Gates to Microprocessors by Sanjay K. Bose, New Age International Publishers.

Name of Reference Books:

1. 8085 Microprocessor Programming & Interfacing – N.K. Srinath, PHI
2. Digital Computer Electronics – Malvino, TMH
3. Microprocessors: Theory and Applications – Intel and Motorolla, Rafiquuzzaman, PHI.
4. 0000 to 8085: Introduction to Microprocessor for Engineers and Scientists, Ghosh & Sridhar, PHI

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Applied Numerical Analysis**	Code:	**324553(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**12**
No. of class Tests to be conducted:	**2 (Minimum)**	No. of assignments to be submitted:	**2 (Minimum)**
ESE Duration:	**Three Hours**	Maximum Marks in ESE: **80**	Minimum Marks in ESE: **28**

Course Objectives

1. The course provides an introduction to several fundamental algorithms for solving scientific and engineering problems and application.
2. This course responds to the needs of the engineering and physical sciences curricula by providing application-oriented numerical methods.
3. The course will develop numerical methods aided by technology to solve algebraic, transcendental, and differential equations, and to calculate derivatives and integrals based on the available discrete data.

Course Outcomes

Upon successful completion of this course, the students should be able to:

1. Find acceptable approximate solutions when exact solutions are either impossible or time-consuming.
2. Approximate a function using an appropriate numerical method for a given set of data.
3. Develop problem solving skills.
4. Devise alternate methods of solution better suited to the capabilities of computers..
5. Describe difficulties that can arise because computers usually use finite precision, often non-decimal arithmetic.

UNIT I **Nonlinear Equations:** Number representation and errors, Taylor Series, Determination of roots of polynomials and transcendental equations by secant method, Newton's method; convergence analysis, Newton's method to solve system of nonlinear equations, polynomial equations, Newton's method for polynomials, Bairstow's method for quadratic factors.

UNIT II **System of Linear Equations:** Matrix notation, eigenvalues and eigenvector, Solutions of linear algebraic equations by Gauss Elimination and Gauss-Jordan methods, Iterative methods-Jacobi and Gauss-Seidel methods and their convergence analysis.

UNIT III **Interpolation and Approximation:** Polynomial interpolation, Lagrangian and Newton forms, divided difference, Backward, Forward and central difference, Weierstrass approximation theorem, Least-squares approximations, Pade approximations, Uniform approximation

UNIT IV **Numerical Differentiation and Numerical Integration:** Introduction, numerical differentiation, methods based on interpolation and finite differences, partial differentiation, Numerical Integration, Newton cotes rules, Trapezoidal rule, Simpson's rule, composite integration methods

UNIT V **Ordinary Differential Equations:** Numerical solution of ordinary differential equations, Taylor series method, Euler and Modified Euler's method, Runge-Kutta methods, multi-step methods, Milne's method, predictor-corrector methods

Text Books:

1. Numerical Methods for Scientific and Engineering computation: M.K. Jain, S.R.K. Iyengar and R.K. Jain, New Age International.
2. Applied Numerical Analysis: C.F. Gerald and P.O. Wheatley, Pearson Education, Sixth edition.

Reference Books:

1. Applied Numerical Me
with MATLAB for Engineers and Scientists: S.C. Chapra, McGraw-Hill.
2. Numerical Mathematic
Computing: W. Cheney and D. Kincaid, Thomson Brooks/Cole, Vikas Publishing House, Fourth edition

Grewwal, Khanna publication

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Integrated Circuits**	Code:	**324554(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**12**
No. of class Tests to be conducted:	**2 (Minimum)**	No. of assignments to be submitted:	**2 (Minimum)**
ESE Duration:	**Three Hours**	Maximum Marks in ESE: **80**	Minimum Marks in ESE: **28**

Course Objectives:

1. To introduce the basic building blocks of linear integrated circuits.
2. To teach the linear and non-linear applications of operational amplifiers.
3. To introduce the theory and applications of analog multipliers and PLL.
4. To teach the theory of ADC and DAC.
5. To introduce a few special function integrated circuits.

Course Outcome:

On completion of this course, the students will have a thorough understanding of operational amplifiers with linear integrated circuits. Also students will be able to design circuits using operational amplifiers for various applications.

UNIT I

Characteristics of Op Amp: Fundamentals of monolithic ICs technology–realization –OPAMP Symbol and terminal characteristics, Block Schematic of OPAMP, Basics of Differential Amplifier (CMRR in terms of 'r' and 'h' parameter), Ideal and Practical OPAMP Characteristics, Open Loop and Closed Loop Configuration of OPAMP, Input & Output impedance of closed loop OPAMP, Input Bias and Offset Currents, Input Offset Voltage, Input Offset-error compensation voltage series feedback and shunt feedback amplifiers, Inverting Amplifier, Non-Inverting Amplifier differential amplifier; frequency response of OP-AMP.

UNIT II

Applications of Op Amp-I: Voltage Follower, summer, differentiator and integrator ,Voltage comparators , Zero Crossing Detector, Level Detector, Window Detector, peak detector, Precision Half Wave Rectifier, Precision Full Wave Rectifier - Instrumentation amplifier, Current to Voltage and voltage to current Converter, active clippers and clampers, Bridge Amplifier, Differentiator, Integrator, Logarithmic amplifier, Norton Amplifier.

UNIT III

Applications of Op Amp-II: S/H circuit, D/A converter (R-2R ladder and weighted resistor types), A/D converter - Dual slope, successive approximation and flash types, First and second order active filters, Phase Shifter, Oscillators-Waveform generator (Square, Triangular, Saw-tooth) ,Schmitt trigger, multivibrator.

UNIT IV

Special ICs: 555 Timer circuit: Functional block, characteristics & applications as Monostable and Astable multivibrator; 566-voltage controlled oscillator circuit; 565-phase lock loop circuit functioning and applications.

UNIT V

Application of ICs: Analog multiplier ICs, Voltage regulator: characteristics, Regulator Performance parameters, Types of Voltage regulator ,Three Terminal IC Regulator (LM 317, LM 337, 78XX, 79XX), [Description, Schematic Diagram and Pin Diagram], dual power circuit design, Switched capacitor filters,

General Purpose IC Regulator (723): Important features and Internal Structure.

Text Books:

1. Integrated Circuits by K. R. Botkar, Khanna Publications
2. Operational Amplifiers by R. Gayekwad, 4th Ed., Pearson Education

Reference Books:

1. Pulse, Digital and Switching Waveforms by Millman & Taub, TMH Publishing Co.
2. Integrated Electronics by Millman & Halkias, TMH Publishing Co.
3. Operational Amplifiers and Linear Integrated Circuits, Lal Kishore, PHI

4. Design and Applications of Analog Integrated Circuits, Soclof, PHI

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Control System Engineering**	Code:	**324555(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**12**
No. of class Tests to be conducted:	**2 (Minimum)**	No. of assignments to be submitted:	**2 (Minimum)**
ESE Duration:	**Three Hours**	Maximum Marks in ESE: **80**	Minimum Marks in ESE: **28**

Course Objectives

This course is intended to introduce the students to mathematical foundations of Control Theory. The aim of the course is to allow them to develop new skills and analytical tools required to analyze and design methods for the control of linear systems.

Course Outcomes

By the end of this module, students will be able to use appropriate analytical tools to model and control a given physical system. Students can decide in advance if a given dynamical system is stable and also develop a controller according to the desired specifications.

UNIT I **Introduction to Control problem:** Concepts of Control Systems – Open Loop and closed control systems and their differences –examples of control systems – Classification of control systems, Feed-Back Characteristics: Effects of feedback; Stability, steady state accuracy, transient accuracy, disturbance rejection, insensitivity and robustness, Mathematical models – Differential equations– Translational and Rotational mechanical systems, thermal systems , liquid level systems, systems with dead time.

UNIT II **Control hardware and their models:** Transfer Function of DC Servo motor – AC Servo motor – Synchro transmitter and Receiver, pneumatic actuators, electro-pneumatic valves, Block diagram representation of systems– Block diagram algebra – Representation by Signal flow graph – Reduction using block diagram and mason's gain formula.

UNIT III **Time response Analysis :** Standard test signals – Time response of second order systems – Time domain specifications – Steady state response – Steady state errors and error constants; Effects of proportional derivative, proportional integral systems, the concept of stability – Routh stability criterion – absolute and relative stability.
Root Locus Technique: The root locus concept – construction of root loci – effects of adding poles and zeros to G(s)H(s) on the root loci

UNIT IV **Analysis in Frequency domain :** Polar Plots, Nyquist Plots and application of Nyquist criterion to find the stability,gain and phase margins,Bode diagrams –Frequency domain specifications and Nichol's chart.

UNIT V **Introduction to design:** Compensator design (Cascade Lag, Cascade Lead, Cascade Lag-Lead) using root locus plots, compensator design (Cascade Lag, Cascade Lead, Cascade Lag-Lead) using Bode plots.

Text Books:

1. Control Systems M. Gopal: Tata McGraw-Hill, 1997.
2. Modern Control Engineering K. Ogata, PHI, Fourth edition. 2003

Reference Books:

1. Control Systems Engineering: I.J. Nagrath and M. Gopal; New Age Intenational Publishers, Third edition, 2002.
2. Control system Engineering:. K. Bhattacharya, Pearson, Second edition
3. Control Systems:Dhanesh N. Manik, Cengage Learning.
4. Automatic control systems: Benjamin C. Kuo, Prentice Hall of India, 2002.

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Communication Theory**	Code:	**324556(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**12**
No. of class Tests to be conducted:	**2 (Minimum)**	No. of assignments to be submitted:	**2 (Minimum)**
ESE Duration:	**Three Hours**	Maximum Marks in ESE: **80**	Minimum Marks in ESE: **28**

Course Objectives

1. The course provides an introduction to analog and digital communication systems.
2. This course responds to the needs of the engineering and technological paraphenia.

Course Outcomes

Upon successful completion of this course, the students should be able to:

1. Acquire the generalize knowledge of communication system in the present scenario.
2. Develop problem solving skills in complex communication networking.

UNIT I **Amplitude Modulation:** Signal analysis (Elementary idea only), Properties of Fourier transform, Need of modulation, Amplitude modulation, Single tone and multi tone amplitude modulation, Amplitude Modulation Index, power relation. Generation and detection of AM wave, Suppressed carrier modulation and detection techniques.

UNIT II **Angle Modulation:** Mathematical equation of frequency modulation (FM), frequency spectrum, phase modulation (PM), relationship between PM and FM, pre-emphasis and de-emphasis, adjacent channel interference, comparison of narrow band and wide band FM, generation of FM, reactance modulator.

UNIT III **Pulse Modulation System:** Sampling theorem, Sampling of Low Pass and band pass signals, Aliasing, Aperture effect, Basic principles of PAM, PWM and PPM, their generation and detection, FDM, TDM, Comparison of TDM and FDM.

UNIT IV **PCM and Digital Modulation Techniques:** Wave form coding techniques, Discretisation in time and amplitude, Quantization, PCM, PCM generator, Quantizer, Transmission band width in PCM, PCM receiver, quantization noise/error in PCM, Companding in PCM, Delta modulation, Adaptive delta modulation, DPCM, Comparison of different DPM methods. Introduction to Digital modulation, Digital modulation formats, Types of digital modulation techniques, Fundamentals of binary ASK, PSK and FSK, Generation of BASK, BPSK and BFSK and their coherent detection techniques.

UNIT V **Information Theory:** Introduction, Sources of information, Contents in DMS, Contents of a symbol, Entropy, Information rate, Discrete memory less channel, Conditional joint entropies, mutual information, Channel capacity, Source coding, Entropy coding, Coding efficiency.

Text Books:

1. Principles of Communication Systems –Taub and Shilling, Tata Mc Graw Hill.
2. A Text Book of Analog & Digital Communication –P. Chakrabarti, Dhanpat Rai & Co.

Reference Books:

1. “Electrical Communication Systems”, Kennedy, TMH.
2. “Digital Communications” Sanjay Sharma, S.K. Kataria& Sons, New Delhi

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Electrical Machine – II Laboratory**	Code:	**324561(24)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum marks in ESE:	**40**	Minimum marks in ESE:	**20**

List of experiments: (Minimum 10 experiments are to be performed)

1. To study squirrel cage & slip ring type Induction motor and Synchronous motor with the help of Cut-view model or Dismantled Motor.
2. To determine the voltage regulation of 3 phase alternator by EMF method.
3. To determine the voltage regulation of 3 phase alternator by ZPF method.
4. To determine the voltage regulation of 3 phase alternator by Direct Loading.
5. To plot the V and inverted V- curve of synchronous Motor at No Load, and Full Load.
6. To perform synchronization of alternator with infinite bus by bright lamp method.
7. To determine Xd & Xq of a salient pole rotor type synchronous machine by slip test.
8. To determine the equivalent circuit parameters of 3-phase induction motor by No-Load &Block Rotor test
9. To Study DOL starter and provide connection to 3- phase Induction motor.
10. To Study Semi-Automatic Star-Delta starter and provide connection to 3-phase Induction motor.
11. To study Contactor type starter for Forward/ Reverse operation of Induction motor
12. To study the speed control of a three phase slip ring I.M by adding external resistance to the rotor circuit.
13. To find Full load Efficiency of Induction Motor by drawing Circle Diagram.
14. Measurement of Speed of Induction Motor by Measuring Rotor Frequency.
15. Visit to the substation of Institute and observe the sequence of operation to make DG set ON and OFF.

Apparatus Required:

1. 3-phase Alternators
2. Resistive Load.
3. 3-phase induction motor
4. Single phase variac
5. Three phase variac
6. Ammeter, Voltmeters, Wattmeters.
7. Starters

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Microprocessor & Interfacing Laboratory**	Code:	**324562(24)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum marks in ESE:	**40**	Minimum marks in ESE:	**20**

List of experiments: (Minimum 10 experiments are to be performed)

1. To Transfer data into specified register.
2. To add content of two register and store result in another register.
3. To add content of two memory locations and store result in another memory locations.
4. To find 2's complement of 8 bit number.
5. To mask upper nibble of the 8 bit number.
6. To transfer block of 10 data bytes from one memory location to another.
7. To transfer block of 10 data bytes from one memory location to another in reverse order.
8. To multiply two 8 bit numbers.
9. To add contents of a block of 10 data bytes.
10. To find largest among the 10 given data bytes.
11. To find number of even and odd values from a given block of data bytes.
12. To arrange given data bytes in ascending order.
13. Two 10 bytes are residing at some memory location , Write a program two add them up and store the result at some other memory location.
14. To count the number (BCD) of times even and odd PARITY bytes are appearing consecutive memory locations.
15. To convert the binary number in to its equivalent BCD.

Apparatus Required:

1. Microprocessor 8085 Kit
2. Switch mode power supply
3. Interfacing cords, FRC cables

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Control System Engineering Laboratory**	Code:	**324563(24)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum marks in ESE:	**40**	Minimum marks in ESE:	**20**

List of Experiments: (To be performed minimum 10 experiments)

1. To determine the gain of an open loop and closed loop system.
2. To study the effect of disturbance on an open loop and closed loop system.
3. Simulation of transfer function using Op-Amp (Analog Computer Trainer)
4. To determine the transfer function of a DC servomotor.
5. Determination of transfer function of an AC servomotor.
6. Characteristics of synchro-transmitter and receiver pair.
7. To study a potentiometer as an error detector.
8. Study of a basic electrically controlled hydraulic system.
9. Study of a basic electrically controlled pneumatic system
10. To Study the time response of a first and second order system.
11. Study of P, PI controller on second order system
12. Study of PID controller on second order system
13. Study of bode plot of a Type 0,Type I and Type II systems.
14. To study the lag compensator and lead compensator.
15. To study the lag-lead compensator.

Apparatus Required:

1. R-L or R-C Circuits, Bread board, CRO, Multimeters, Function Generator.
2. Synchro Transmitter-receiver Pair.
3. DC Servomotor.
4. AC Servomotor.
5. Potentiometer.
6. Bode Plot Analyzer.
7. Linear Variable Differential Transformer.
8. Analog Computer trainer
9. P, PI, PID Controller trainer.
10. Stepper Motor.
11. Lag Compensator, Lead Compensator, Lag-Lead Compensator kits.
12. Hydraulic and Pneumatic systems.

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Branch:	**Electrical Engineering**	Semester:	**V**
Subject:	**Mini Project**	Code:	**324564(24)**
Total Lab Periods:	**36**	Project Group Size:	**Not more than 4 Students**
Maximum marks in ESE:	**40**	Minimum marks in ESE:	**20**

1. The basic objective of the Mini Project is to inculcate the habit of enquiry, Team work, Confidence to tackle new problems and to develop their skill so that they can successfully make their minor / major project in higher semesters.
2. The Mini Project model must be prepared INHOUSE (in college) on their own. For this, components must be brought by the students and Tools/ Accessories will be provided by the institute. It is again highlighted that the mini project MUST be prepared in the Project Lab / Workshop in the presence of supervisor.
3. The Mini Project must be submitted along with typed report, in the same format as the report for Major project is submitted. The report will be Soft wound with transparent sheet stapled at the top and bottom , Stapled side must be covered with Tape.
4. Projects may be selected from Electrical / Electronic Magazines, books, journals. Highly advance circuit using Microcontroller etc are not expected at this stage. Common Mini Projects may also be prepared.
5. Mini project must be Hardware based working model. **Software based projects are not permitted as mini project**.

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Name of Program:	**Bachelor of Engineering**		
Branch:	**Common to All Branches**	Semester:	**V**
Subject:	**Personality Development**	Code:	**300565 (46)**
No. of Lectures:	**2/Week**	Tutorial Period:	**NIL**
Total Marks in ESE:	**NIL**	Marks in TA:	**20**
Minimum number of Class Tests to be conducted:	**Two**		

Objective: The course is introduced to develop one's outer and inner personality tremendously and enrich the abilities to enable one to meet the challenges associated with different job levels. Personality Development is essential for overall development of an individual apart from gaining technical knowledge in the subject.

Course Objectives

Upon completion of this course, the student shall be able

- To understand the concept of personality and image;
- To develop leadership, listening and interacting skills;
- To develop attitudinal changes;
- To develop decision-making qualities; and
- To communication skill.

UNIT I **Personality concepts:** What is Personality – its physical and psychic aspects. How to develop a positive self-image. How to aim at Excellence. How to apply the cosmic laws that govern life and personality. How to improve Memory – How to develop successful learning skills. How to develop and effectively use one's creative power. How to apply the individual MOTIVATORS that make you a self-power personality.

UNIT II **Interpersonal Skills:** Leadership: Leaders who make a difference, Leadership: your idea, What do we know about leadership? If you are serious about Excellence. Concepts of leadership, Two important keys to effective leadership, Principles of leadership, Factors of leadership, Attributes. Listening: Listening skills, How to listen, Saying a lot- just by listening, The words and the music, How to talk to a disturbed person, Listening and sometimes challenging. How to win friends and influence people, How to get along with others. How to develop art of convincing others. How can one make the difference. How to deal with others particularly elders. Conflicts and cooperation.

UNIT III **Attitudinal Changes: Meaning of attitude,** benefits of positive attitudes, How to develop the habit of positive thinking.
Negative attitude and wining: What is FEAR and how to win it. How to win loneliness. How to win over FAILURE. How to win over PAIN. How to win over one's ANGER and others anger. What is stress and how to cope up with it? The art of self-motivation. How to acquire mental well-being. How to acquire physical well-being.

UNIT IV **Decision Making:** How to make your own LUCK. How to plan goals/objectives and action plan to achieve them. How to make RIGHT DECISION and overcome problems. How to make a Decision. Decision making: A question of style. Which style, when? People decisions: The key decisions. What do we know about group decision making? General aids towards improving group decision making.

UNIT V **Communication Skills: Public Speaking:** Importance of Public speaking for professionals. The art of Speaking - Forget the fear of presentation, Symptoms of stage fear, Main reason for speech failure, Stop failures by acquiring Information; Preparation & designing of speech, Skills to impress in public speaking & Conversation, Use of presentation aids & media.
Study & Examination: How to tackle examination, How to develop successful study skills.
Group discussions: Purpose of GD, What factors contribute to group worthiness, Roles to be played in GD.

Course Outcomes:

- The students will be able to develop inner and outer personality exposure;
- The students will be able to develop effective leadership qualities and interacting skills;
- The students will be able to develop positive attitude, motivating skills and develop winning philosophies;
- The students will be able to develop decision-making tools; and
- The students will be able to develop group presentation, public speaking and impressive conversation.

Text Books:

1. Basic Managerial Skills for all by E. H. McGrawth, prentice Hall India Pvt. Ltd., 2006
2. Basic Employability Skills by P. B. Deshmukh, BSP Books Pvt. Ltd., Hyderabad, 2014

Reference Books:

1. How to Develop a Pleasing Personality by Atul John Rego, Better Yourself Books, Mumbai, 2000
2. How to Succeed by Brain Adams, Better Yourself Books, Mumbai, 1969
3. Personality: Classic Theories & Modern Research; Friedman ; Pearson Education, 2006
4. How to Win Friends and Influence People by Dale Carnigie, A. H. Wheeler 2006