UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Values & Ethics in Profession
Course Code: HU301
L-T Scheme: 3L+1T **Course Credits: 3**

Introduction:

This course teaches students the basic principles of Values and Ethics within profession. These deals mainly with

- Values in professional life
- Ethics in professional life
- Resources depletion
- Conservation of resources for future generations
- Technology transfer
- Eco friendly Technology
- Value crisis in society
- Present society without values and Ethics.

Objectives:

This course relates to the present world and teaches students the need and importance of values and the problems faced by the present society in terms of depletion of natural resources and how to control the same for the sake of future generations.

Learning Outcomes:

Knowledge:

1. Understand the present scenario of degradation of values and Ethics system
2. Depletion of resources and how to conserve them.
3. Club Of Rome and what all stalwarts have thought to improve the situation
4. Sustainable Development.
5. Value spectrum of a good life
6. Present societal changes in terms of values and ethics
7. What steps to be taken to improve value system?
8. How to avoid conflicts to have a peaceful job life.
9.

Course Contents:

Unit 1: Rapid Technological growth and depletion of resources, Reports of the Club of Rome. Limits of growth: Sustainable development Energy Crisis: Renewable Energy Resources Environmental degradation and pollution. co-friendly Technologies. Environmental Regulations, Environmental Ethics Appropriate Technology Movement of Schumacher; later developments Technology and developing notions. Problems of Technology transfer, Technology assessment impact analysis. Human Operator in Engineering projects and industries. Problems of man, machine, interaction, Impact of assembly line and automation. Human centered Technology.

Unit 2: Engineering profession: Ethical issues in Engineering practice, Conflicts between business demands and professional ideals. Social and ethical responsibilities of Technologists. Codes of professional ethics. Whistle blowing and beyond.

Unit 3: Values Crisis in contemporary society Nature of values: Value Spectrum Of good life Psychological values: Integrated personality; mental health Societal values: The modern search for a good society, justice, democracy, secularism, rule of law, values in Indian Constitution. Aesthetic values: Perception and enjoyment of beauty, simplicity, clarity Moral and ethical values: Nature of moral judgments; canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility.

Books:

AN Tripathi ,Human values in the Engineering Profession, Monograph published byIIM,Calcutta1996

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Numerical Methods
Course Code: M(CS)301
L-T Scheme: 2-1 **Course Credits: 3**

Introduction:

This course offers an advanced introduction to numerical linear algebra. Topics include direct and iterative methods for linear systems, eigenvalue decompositions and QR/SVD factorizations, stability and accuracy of numerical algorithms, the IEEE floating point standard, sparse and structured matrices, preconditioning and linear algebra software. Problem sets require some knowledge of MATLAB

Objectives:

The primary goal is to provideengineering majors with a basic knowledge of numerical methods including:rootfinding, elementary numerical linear algebra,integration, interpolation,solving systems of linearequations, curve fitting, and numerical solution to ordinary differential equations.'C' language andSCILABisthe software environment used for implementation and application of these numerical methods. Thenumerical techniques learned in this course enable students to work with mathematical models of technologyand systems.

Learning Outcomes:

Knowledge:

1. Students would be able to assess the approximation techniques to formulate and apply appropriate strategy to solve real world problems.
2. Be aware of the use of numerical methods in modern scientific computing.
3. Be familiar with finite precision computation.
4. Be familiar with numerical solution of integration, linear equations, ordinary differential equations, interpolations.

Application:

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to design and conduct experiments, as well as to analyze and interpret data
3. An ability to design a system, component, or process to meet desired needs within realistic constraints
4. such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
5. An ability to function on multidisciplinary teams

Course Contents:

Unit 1: Approximation in numerical computation:Approximation of numbers, Types of errors, Calculation of errors.

Unit 2: Interpolation: Finite Differences and Divided differences, Newton forward/backward Interpolation, Lagrange's method and Newton's divided difference method.

Unit 3: Numerical integration: Trapezoidal rule and Simpson's 1/3 rule.

Unit 4: Numerical solution of a system of linear equations: Gauss elimination method, Matrix inversion, LU Factorization method, Gauss-Seidel iterative method.

Unit 5: Numerical solution of Algebraic equation: Bisection method, Regula-Falsi method, Newton-Raphson method and order of convergence.

Unit 6: Numerical solution of ordinary differential equation: Euler's method, Runge-Kutta methods, Predictor-Corrector methods and Finite Difference method.

Text Books

1. Dutta& Jana: Introductory Numerical Analysis(All course).

2. Dr.B.S.Grewal:Numerical Methods in Engineering &science(All Course).

3. Jain, Iyengar ,& Jain: Numerical Methods (Problems and Solution).

References

1. Baburam: Numerical Methods, Pearson Education.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Analog Electronic Circuit
Course Code: EC303
L-T Scheme: 3-1 **Course Credits: 3**

Introduction:

This course examines bipolar junction transistor biasing concept, operational amplifier and different types of filters and tuned amplifiers circuit and their application. The Topics to be covered (tentatively) include:

- Graduate will be able to understand the basic properties of electronic system
- Graduate will be able to understand different type of diode and their applications
- Graduate will acquire knowledge on bipolar junction transistor and applications
- Graduate will acquire knowledge of mosfet and circuits
- Graduate will acquire knowledge of voltage and power
- Graduate will get knowledge on feedback in amplifiers and oscillator
- Graduates will be able to understand and apply knowledge differential amplifier
- Graduates will be able to understand on operational amplifier and its applications
- Graduates will be able to understand and apply knowledge filters and tuned amplifiers
- Graduate will acquire knowledge of waveform generation and shaping circuit

Objectives:

The Course Educational Objectives are:

- An understanding of basic EE abstractions on which analysis and design of electrical and electronic circuits and systems are based, including lumped circuit, digital and operational amplifier abstractions.
- The capability to use abstractions to analyze and design simple electronic circuits.
- The ability to formulate and solve the differential equations describing time behavior of circuits containing energy storage elements.
- An understanding of how complex devices such as semiconductor diodes and field-effect transistors are modeled and how the models are used in the design and analysis of useful circuits. The capability to design and construct circuits, take measurements of circuit behavior and performance, compare with predicted circuit models and explain discrepancies.

Learning Outcomes:

Knowledge:

Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

1. Learn how to develop and employ circuit models for elementary electronic components, e.g., resistors, sources, inductors, capacitors, diodes and transistors.
2. Become adept at using various methods of circuit analysis, including simplified methods such as series-parallel reductions, voltage and current dividers, and the node method.

Course Description

3. Appreciate the consequences of linearity, in particular the principle of superposition and Thevenin-Norton equivalent circuits.
4. Gain an intuitive understanding of the role of power flow and energy storage in electronic circuits.
5. Develop the capability to analyze and design simple circuits containing non-linear elements such as transistors using the concepts of load lines, operating points and incremental analysis.
6. Learn how the primitives of Boolean algebra are used to describe the processing of binary signals and to use electronic components such as MOSFET's as building blocks in electronically implementing binary functions
7. Learn how the concept of noise margin is used to provide noise immunity in digital circuits. Be introduced to the concept of state in a dynamical physical system and learn how to analyze simple first and second order linear circuits containing memory elements.
8. Be introduced to the concept of singularity functions and learn how to analyze simple circuits containing step and impulse sources Be introduced to the concept of sinusoidal-steady-state (SSS) and to use impedance methods to analyze the SSS response of first and second-order systems
9. Gain insight into the behavior of a physical system driven near resonance, in particular the relationship to the transient response and the significance of the quality factor Q. Learn how operational amplifiers are modeled and analyzed, and to design Op-Amp circuits to perform operations such as integration, differentiation and filtering on electronic signals

Application:

1. To Understand the principles of gain and loss and the function of amplifiers using analog circuits element.
2. Use of simulation program with integrated circuit emphasis (SPICE)/electronic computer aided design (ECAD) techniques to analyse and develop circuits.
3. Use of prototyping methods eg breadboard, stripboard, printed circuit board (PCB); typical circuits eg filter, amplifier, oscillator, transmitter/receiver, power control, circuits/systems with telecommunication applications

Course Contents:

Unit 1: Active & Passive Devices, overview of analog circuits, application of analog circuits-implementation etc.[2]
Linear integrated circuits-D. Roy Choudhury, ShailB. Jain (Chapter 6&7)
Electronic Devices and Circuit Theory- Boylested (Chapter-1&2)

Unit 2: Characteristics of ideal & real diodes, diode circuits rectifiers, clipping, clamping, special types of diodes & their applications schottky, varactor, photodiodes, LEDs[3]
Linear integrated circuits-D. Roy Choudhury, ShailB. Jain (Chapter 6&7)
Electronic Devices and Circuit Theory- Boylested (Chapter-1&2)

Unit 3: Characteristics of BJT; Ebers-Moll equations and large signal models; inverse mode of operation, early effect; BJT as an amplifier and as a switch; DC biasing of BJT amplifier circuits; small signal operations and models; Single state BJT amplifiers – CE, CB and CC amplifiers; high frequency models and frequency response of BJT amplifiers; Basic design in discrete BJT amplifiers; complete design examples; Basic BJT digital logic inverter; SPICE modeling of BJT and amplifier circuits.[8]
Electronic Devices and Circuit theory – Boylestead and Nashesky – PHI/Pearson Education(Chapter-3,4)

Electronics–fundamental— D Chattopadhaya & P. C. Rakhit (Chapter---8)

Microelectronic circuits---Sedra &Smith (Chapter---3)

Course Description

Unit 4: MOSFET -operational Characteristics; PMOS, NMOS and CMOS current voltage characteristics; SPICE model of MOSFET; DC analysis; Constant Current Sources and Sinks, MOSFET as an Amplifier and as a Switch; Biasing on MOS Amplifiers; Small Signal Operation of MOS amplifiers, Common-source, common gate and source Follower Amplifiers; CMOS amplifiers; MOSFET Digital logic inverters, voltage transfer characteristics, SPICE modeling of MOSFET circuits.[6]
Electronic Devices and Circuit theory – Boylestead and Nashesky – PHI/Pearson Education(Chapter-5)

Unit 5: Classification amplifiers; Class A, Class B, Class AB Class C – Circuit operation, transfer characteristics, power dissipation, efficiency. Practical BJT and MOS power transistors, thermal resistance, heat sink design; IC power amplifiers.[4]
Electronic Devices and Circuit theory – Boylestead and Nashesky – PHI/Pearson Education(Chapter-15)

Unit 6: Feedback concept and definition; Four basic feedback topologies; Analysis of Series-shunt, series-series, shunt-shunt and shunt-series feedback amplifiers, stability in feedback amplifiers, frequency compensation; principle of sinusoidal oscillators and barkhausen criterion, Active-RC and Active-LC sinusoidal oscillators; Wien Bridge; Phase-Shift, Quadrature Oscillators, Crystal Oscillators, application in voltage regulation[5]
Electronics devices and circuits (Chapter 14&15) S Salivahanan N.Sureshkumar A.Vallavaraj
Electronics-Fundamentals and Applications----- D Chattopadhayay P.C.Rakhit (Chapter—10)

Unit 7: Concept of operational amplifiers; Ideal operational amplifier parameters; Inverting and non-inverting configurations; Common OPAMP IC: Gain-frequency and Slew rate, SPICE modeling and simulation examples; Instrumentation amplifiers, Integrators, Differentiators, Logarithmic Amp; Multipliers; Comparators; Schmitt triggers [8]
Op amps and linear Integrated Circuits - R.A. Gayakwad(chapter-3 & 4)
Linear integrated circuits-D. Roy Choudhury, shail B. Jain(Chapter-4)

Unit 8: Filter characteristics and specifications; First and Second Order Filter functions, First-order and second order filter network using OPAMPS; Tuned Amplifiers, Basic principle, amplifiers with multiple tuned circuits, Synchronous and Stagger tuning, RF amplifiers considerations[4]
Electronics Devices and Circuits----S Salivahanan N.Sureshkumar A.Vallavaraj(Chapter-8)

Unit 9: Multivibrators – Astable, monostable and bistable circuits, bistable circuit as memory element comparator generation of square, triangular waveforms and standardized pulse using AMV and MMV, Application of 555 timer[4]
Linear Integrated Circuit:---------D. Roy Choudhary S.B.Jain(Chapter-9)

Text Books

1. Microelectronic Circuits – Sedra and Smith(Fifth Edition) (Oxford)
2. Electronic Devices and Circuit theory – Boylestead and Nashesky – PHI/Pearson Education
3. Millman and Halkias – Integrated Electronics – TMH Op Amp and Linear Ics.
4. Electronics–fundamental— D Chattopadhaya & P. C. Rakhit
5. Linear integrated circuits-D. Roy Choudhury, ShailB. Jain

References

1. R. A. Gackward – PHI/Pearson Education
2. Sergio Franco – Operational Amplifier (JMH)
3. Electronics Devices and Circuits----S Salivahanan N.Sureshkumar A.Vallavaraj

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Course Description

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Course Description

Title of Course:Digital Electronic circuit
Course Code: EC(EE)302
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines about Digital Electronics circuit. The Topics to be covered (tentatively) include:

- Data and Number System
- Boolean algebra
- Combinational Circuit
- Sequential Circuit
- A/D converter and D/A converter
- Memory system

Objectives:

1. To acquire knowledge on basics of digital circuits and its applications.
2. This course deals with the basics of Boolean algebra, Digital principles and circuits.
3. The course starts with the basics of Boolean algebra and Boolean expression minimization techniques. Then it explains simple combinational networks like Multiplexers, decoders etc.
4. Sequential and combinational digital circuits are the building blocks of
5. any processor, irrespective of its application.
6. After this the difference between the combinational technologies and sequential circuits is dealt with. Finally, it gives the method to realize the basic gates using different technologies.

Learning Outcomes:

Once the student has successfully completed this course, he/she will be able to answer the following questions or perform following activities:

1. Able to explain the basic concepts of digital electronics circuits
2. Able to describe different types of logics, complexity, circuit specifications.
3. On successful completion of this Course, the students would be able to minimize functions using any type of minimizing algorithms (Boolean algebra, Karnaugh map).
4. Define the problem (Inputs and Outputs), write its functions. Implement functions using digital circuit (Combinational or Sequential) and knowledge in analyzing and designing procedures of Combinational and Sequential circuits.
5. To be able to differentiate electronic from electrical systems and identify the basic blocks in any electronic system

Course Contents:

1. Data and number systems; Binary, Octal and Hexadecimal representation and their conversions; BCD, ASCII, EBDIC, Gray codes and their conversions; Signed binary number representation with 1's and 2's complement methods, Binary arithmetic [5]

2. Venn diagram, Boolean algebra; Various Logic gates- their truth tables and circuits; Representation in SOP and POS forms; Minimization of logic expressions by algebraic method, K-map method [6]

3. Combinational circuits- Adder and Subtractor circuits; Applications and circuits of Encoder, Decoder, Comparator, Multiplexer, De-Multiplexer and Parity Generator. [8]

4. Memory Systems: RAM, ROM, EPROM, EEROM; Design of combinational circuit using ROM, Programming logic devices and gate arrays. (PLAs and PLDs) [5]

5. Sequential Circuits- Basic memory element-S-R, J-K, D and T Flip Flops, various types of Registers and counters and their design, Irregular counter, State table and state transition diagram, sequential circuits design methodology.[9]

6. Different types of A/D and D/A conversion techniques; Logic families- TTL, ECL, MOS and CMOS, their operation and specifications. [6]

Text Books

1. A.Anand Kumar, Fundamentals of Digital Circuits- PHI
2. A.K.Maini- Digital Electronics- Wiley-India
3. Kharate- Digital Electronics- Oxford

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Electric Circuit Theory
Course Code: EE301
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course explores the different types of network and circuits. It also helps in analysis signals and systems alongside the knowledge of switching and the corresponding response in a network. The Topics to be covered (tentatively) include:

- Electrical systems
- Different network theorems
- Analysis of signals
- Analysis of transient behaviour in electrical systems
- Two port network
- Network topology
- Filters

Objectives:

To develop the fundamental tools of linear circuit analysis which will be useful to all engineers. To learn the details of circuits analysis including the network elements, sources and operational amplifiers. To prepare students for more advanced courses in circuit analysis.

Learning Outcomes:

Knowledge:

1. Identify linear systems and represent those systems in schematic form
2. Apply Kirchhoff's current and voltage laws and Ohm's law to circuit problems
3. Simplify circuits using series and parallel equivalents and using Thevenin and Norton equivalents
4. Simplify and analyse the magnetically coupled circuits.
5. Identify and model first and second order electric systems involving capacitors and inductors
6. Predict the transient behavior of first and second order circuits

Application:

1. The application of this course is immense and vivid, anything that is electrically operated can be analysed and understood with the help of the understanding this subject.

Course Contents:

Unit 1: Continuous &Discrete, Fixed &Time varying, Linear andNonlinear,LumpedandDistributed,PassiveandActivenetworksand systems. Independent&Dependentsources,Step,Ramp,Impulse,Sinusoidal,Square,Sawtoothsignals.

Unit 2: Magnetic coupling, Polarity of coils, Polarity of inducedvoltage, Concept of Self and Mutual inductance, Coefficient of coupling, modellingofcoupledcircuits,Solutionof problems.

Unit 3: Impulse,Step&SinusoidalresponseofRL, RC andRLCcircuits.Transientanalysisofdifferentelectricalcircuitswithandwithoutinitial conditions.Conceptof Convolutiontheoremanditsapplication. Solutionof ProblemswithDC&ACsources.

Unit 4: FourierseriesandFourierTransform(inContinuousdomainonly).Applicationincircuitanalysis.

Unit 5: Formulationofnetworkequations,Sourcetransformation,Loopvariableanalysis,Node variableanalysis.Network theorem: Superposition, Thevenin's, Norton's &Maximum power

transfertheorem.Millman'stheoremanditsapplicationin threephaseunbalanced circuitanalysis.Solutionof ProblemswithDC&ACsources.

Unit 6: ConceptofTree,Branch,Treelink,Incidencematrix,Tie-setmatrixandloopcurrents,Cutsetmatrixandnodepair potentials.Duality.

Unit 7: Open circuit Impedance &Short circuitAdmittance parameter, Transmission parameters, Hybrid parameters and their interrelations.Drivingpointimpedance&Admittance.

Unit 8: AnalysisandsynthesisofLowpass,Highpass,Bandpass,Bandreject,Allpassfilters (firstandsecondorderonly)usingoperationalamplifier.

Text Books

1. S P Ghosh, A K Chakraborty, Network Analysis and Synthesis- McGraw Hill.

References

1. C. K. Alexander, M. N. O. Sadiku, *Fundamentals of Electric Circuits (Fifth Edition)*, McGraw Hill, 2013.
2. Introduction to Electric Circuits, R. C. Dorf, Wiley 1993 (second edition)
3.D. E. Johnson, J. R. Johnson, J. L. Hilburn, and P. D. Scott, *Electric Circuit Analysis*, Third Edition, Prentice-Hall 1997.
4.Electric Circuit, M. Nahvi& J. Edminister, Schaum's outline series, The McGraw HillCompany.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Field Theory
Course Code: EE302
L-T Scheme: 3-0 **Course Credits: 3**

Introduction:

This course gives a thorough understanding in the various aspects of field theory.

Objectives:

The objective of the course is toto introduce the student fundamentals of electric and magnetic fields.

Knowledge:

1. Understanding of electric fields
2. Understanding of electromagnetic fields
3. Deeper understanding of polarization.
4. Understanding of wave equation and propagation of electromagnetic energy.

Application:

Student gets the understanding of various aspects of fields.

Introduction: Co-ordinate systems and transformation, Cartesian coordinates, Circular cylindrical coordinates, Spherical coordinates & their transformation. Differential length, area and volume in different coordinate systems. Solution of problems

Introduction to Vector calculus: DEL operator, Gradient of a scalar, Divergence Of a vector & Divergence theorem, Curl of a vector & Strokest theorem, Laplacian of a scalar, Classification of vector fields,Helmholtz's theorem. Solution of problems

Electrostatic field: Coulomb's law, field intensity,Gauss's law, Electric potential And Potential gradient, Relation between and Electric dipole and flux lines. Energy density in electrostatic field. Boundary conditions: Dielectric-dielectric, Conductor–dielectric, Conductor-free space. Poisson's and Laplace's equation, General procedure for solving Poisson'sand
Laplace's equation. Solution of problems

Magneto static fields: Biot-savart law, Ampere's circuit law, Magnetic flux density, Magnetic static and Vector potential, Forces due to magnetic field, Magnetic torque and moments, Magnetisation in material, Magnetic boundary condition, Inductor and Inductances, Magnetic energy, Force on magnetic material. Solution of problems

Magneto static fields: Biot-savart law, Ampere's circuit law,Magnetic flux density, Magnetic static and Vector potential, Forces due to magnetic field, Magnetic torque and moments, Magnetisation in material, Magnetic boundary condition, Inductor and Inductances, Magnetic energy, Force on magnetic material. Solution of problems

Electromagnetic fields: Faraday'slaw, Transformer and motional emf, Displacement current, Maxwell's equations,Time varying Potential, Time harmonic fields. Solution of problems

Electromagnetic wave propagation: Wave equation,Wave propagation in lossy dielectric, Plane waves in lossless dielectric, Plane wave in free space, Plane wave in good conductor, Skin effect, Skin depth, Power & Poynting vector, Reflection of a plane wave at normal incidence, reflection of a plane wave at oblique incidence, Polarisation. Solution of problems

Transmission line: Concept of lump & distributed parameters, Line parameters, Transmission line equation & solutions, Physical significance of solutions, Propagation constants, Characteristic impedance,Wave length,Velocity of propagation. Solution of problems

TextBooks:

1. ElementsofElectromagnetic,MathewN.O.Sadiku,4th edition,Oxforduniversitypress.

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2. EngineeringElectromagnetic,W.H.Hyat&J.A.Buck,7thEdition,TMH
3. Theory andproblemsofElectromagnetic,Edminister,2nd Edition,TMH
4. Electromagneticfieldtheory fundamentals,Guru&Hizroglu,2nd edition,CambridgeUniversity Press.

ReferenceBooks:

1. Electromagneticwithapplication,Krause,5th Edition,TMH.
2. ElementsofEngineeringElectromagnetic,N.N.Rao,6th Edition,PearsonEducation.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Analog & Digital Electronic Circuit Lab
Course Code: EC(EE)391
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
The objective of this course is to introduce the organization of acomputer and its principal components, viz, ALU, Control, Memory andInput/output. The course will also enable the student to understand thedesign components of a digital subsystem that required realizing variouscomponents such as ALU, Control, etc.

Learning Outcomes:
Upon successful completion of the Lab course, a student will be able to:
1. An ability to implement basic gates and their operations.
2. An ability to understand and implement Flip Flops
3. An ability to understand and implement Multiplexers
4. An ability to understand and implement shift registers andcounters
5. An ability to understand and implement Encoders and Decoders
6. An ability to understand and implement Half adder and FulladderMust be able to build a small 8 bit processor that supports reading frommemory (16 bytes), Execute 3 instructions, and add/subtract/stop. Alloperations are to be performed on set of 4 registers. Must implementprogram counter and decoder to fetch the next instruction.

Course Contents:
Exercises that must be done in this course are listed below:
1.Realization of basic gates using Universal logic gates
2.Code conversion circuits- BCD to Excess-3
3.One bit and two bit comparator circuits
4. Construction of simple Decoder and Multiplexer circuits using NAND gate.
5. Construction of simple arithmetic circuits-Adder, Subtractor.
6. Realization of RS-JK and D flip-flops using Universal logic gates.
7. Realization of Ring counter and Johnson's counter.
8. Study of Diode as clipper & clamper.
9.Study of Zener diode as a voltage regulator.
10.Study of ripple and regulation characteristics of full wave rectifier without and with capacitor filter.
11. Study of characteristics curves of B.J.T.
12.Study Inverting and Non –inverting Amplifier

Text Book:
1.

Recommended Systems/Software Requirements:

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Numerical Methods Lab
Course Code: M(CS)391
L-T–P Scheme: 0-0-3 **Course Credits: 2**

Introduction:

This course offers an advanced introduction to numerical linear algebra. Topics include direct and iterative methods for linear systems, eigenvalue decompositions and QR/SVD factorizations, stability and accuracy of numerical algorithms, the IEEE floating point standard, sparse and structured matrices, preconditioning and linear algebra software. Problem sets require some knowledge of MATLAB

Objectives:

1. To give an overview of what can be done.
2. To give insight into how it can be done.
3. To give the confidence to tackle numerical solutions.
4. An understanding of how a method works aids in choosing a method. It can also provide an indication of what can and will go wrong, and of the accuracy which may be obtained.
5. To gain insight into the underlying physics.
6. The aim of this course is to introduce numerical techniques that can be used on computers, rather than to provide a detailed treatment of accuracy or stability.

Learning Outcomes:

Knowledge:

On completion of this course, the student will be able to:

1. Demonstrate skills in using computer programming tools for engineering calculations.
2. Demonstrate ability to construct simple computer algorithms using a programming tool.
3. Apply simple numerical methods to solve mathematical problems with relevance to civil engineering.
4. Appreciate the limitations and the applicability of the numerical methods.
5. Apply computer-based numerical methods for the solution of engineering problems.

Course Contents:

1. Assignments on Newton forward /backward, Lagrange's interpolation.
2. Assignments on numerical integration using Trapezoidal rule, Simpson's 1/3 rule, Weddle's rule.
3. Assignments on numerical solution of a system of linear equations using Gauss elimination and Gauss-Seidel iterations.
4. Assignments on numerical solution of Algebraic Equation by Regular-falsi and Newton Raphson methods.
5. Assignments on ordinary differential equation: Euler's and Runga-Kutta methods.
6. Introduction to Software Packages: Matlab / Scilab / Labview / Mathematica.

Text Books:

1. Introductory method of numerical analysis, Sastry S.S
2. Computer Programming in fortran 77, Rajaraman V
3. Numerical methods: for scientific and engineering computation,Mahinder Kumar Jain

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Course Description

Title of Course: Electric Circuit Theory Lab
Course Code: EE391
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:

1. To learn and understand to design electrical circuit practically or through any simulation software.
2. To provide an understanding of the circuit designing aspects in bread board.
3. To provide a window to investigate and verify various laws, theories, and concepts regarding electrical circuits practically or virtually by simulation software.

Learning Outcomes: The students will have a detailed knowledge of electrical circuit design using different electrical elements and sources through bread board or by any simulation software. The students will also get the opportunity& better understanding of various concepts, laws, & theories applicable in any electrical circuit by investigating and varying them in the practically designed circuit.Upon the completion of Operating Systems practical course, the student will be able to:

- **Understand** and implement electrical circuit design knowledge to realize any electrical circuit practically
- **Use** modern simulation software to recreate any practical circuit virtually**.**
- **Understand** the benefits of circuit design in bread board.
- **Analyze** designed circuit to see weather various laws, theories, and concepts regarding electrical circuits holds or not..
- **Simulate**electrical circuitsthrough any simulation software to check weather various laws, theories, and concepts regarding electrical circuits they studied holds or not .\

Course Contents:

Exercises that must be done in this course are listed below:

Exercise No.1: Verification of Thevenin's Theorem: Hardware/Simulation
Exercise No. 2: Verification of Norton's Theorem: Hardware/Simulation
Exercise No. 3: Verification of Maximum Power Transfer Theorem: Hardware/Simulation
Exercise No. 4: Verification of Superposition Theorem: Hardware/Simulation
Exercise No. 5: Study of Z-parameters of any practical circuit treated as Two-port network: Hardware/Simulation
Exercise No. 6: Study of Y-parameters of any practical circuit treated as Two-port network: Hardware/Simulation
Exercise No. 7: Study Resonance of a series RLC circuit: Hardware

Text Book:

1. S.P.Ghosh & A.Chakraborty , "Circuit Theory & Networks", TMH
2. Muhammad H. Rashid, "Introduction to PSpice Using Orcad for circuits and Electronics", Pearson Education.

Recommended Systems/Software Requirements:

1. MATLAB
2. SPICE.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Technical Report Writing & Language Lab
Course Code: HU481
L-T-P scheme: 0-0-2 **Course Credit: 2**

Objectives:

1. To inculcate a sense of confidence in the students.
2. To help them become good communicators both socially and professionally.
3. To assist them to enhance their power of Technical Communication.

Learning Outcomes:

Course Contents:
Exercises that must be done in this course are listed below:

Exercise No.1: Report Types (Organizational/Commercial/Business/Project)

Exercise No. 2: Report Format &Organization of Writing Materials

Exercise No. 3: Report Writing (Practice Sessions &Workshops)

Exercise No. 4: Introductory Lecture to help the students get a clear idea of Technical Communication& the need of Language Laboratory Practice Sessions

Exercise No. 5: Conversation Practice Sessions: (To be done as real life interactions)
a) Training the students by using Language Lab Device/ Recommended Texts/cassettes / cd to get their Listening Skill & Speaking Skill honed
b) Introducing Role Play & honing overall Communicative Competence

Exercise No. 6: Group Discussion Sessions:
a) Teaching Strategies of Group Discussion
b) Introducing Different Models & Topics of Group Discussion
c) Exploring Live/Recorded GD Sessions for mending students' attitude/approach & fortaking remedial measure Interview Sessions;
d) Training students to face Job Interviews confidently and successfully
e) Arranging Mock interviews and Practice Sessions for integrating Listening Skill with Speaking Skill in a formal situation for effective communication

Exercise No. 7: Presentation:
a) Teaching Presentation as a skill
b) Strategies and Standard Practices of Individual/Group Presentation
c) Media & Means of Presentation: OHP/POWERPOINT/Other Audio-Visual Aids

Exercise No. 8: Competitive Examination:
a) Making thestudentsawareofProvincial/National/InternationalCompetitiveExaminations
b) Strategies/Tactics for success in Competitive Examinations
c) SWOT Analysis and its Application in fixing Target

Text Book:

1. NiraKonar: English Language Laboratory: A Comprehensive Manual
2. D. Sudharani: Advanced Manual for Communication Laboratories& Technical Report Writing Pearson Education (W.B. Edition), 2011 PHI Learning, 2011