Syllabus of the courses where the revision was carried out program wise in the academic year 2018-2019

ADITYA ENGINEERING COLLEGE

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Aditya Nagar, ADB Road, Surampalem - 533437, Near Kakinada, E.G.Dt., Ph:99498 76662

Department of Civil Engineering

Syllabus revision Index for the Academic Year 2018-2019 B.Tech Civil Engineering

S.No	Name of the course	Percentage of syllabus change
1	Probability and Statistics	25
2	Surveying	33.2
3	Surveying Lab	50
4	Strength of Materials Lab	50
5	Fluid Mechanics and Hydraulic Machinery Lab	50
6	Managerial Economics and Financial Analysis	24

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Department of Humanities & Basic Sciences

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Probability & Statistics	• Probability & Statistics
Course Code	R1621011/R1622271	171BS3T10/171BS4T10
Syllabus	UNIT I: Discrete Random variables and Distributions: Introduction-Random variables- Discrete Random variable-Distribution function Expectation-Moment Generating function-Moments and properties. Discrete distributions: Binomial, Poisson and Geometric distributions and their fitting to data.	UNIT I: Random variables and Distributions Review of elementary probability, Random variables- Discrete and Continuous Random variable-Distribution function-Expectation, variance, Moment Generating function – Discrete Distributions- Binomial, Poisson Continuous Distributions -Normal Distribution.
	UNIT II: Continuous Random variable and distributions: Introduction-Continuous Random variable-Distribution function-Expectation-Moment Generating function-Moments and properties. Continuous distribution: Uniform, Exponential and Normal distributions, Normal approximation to Binomial distribution -Weibull, Gamma distribution.	UNIT II: Sampling Theory Introduction - Population and samples- Sampling distribution of means (known and unknown), proportion, sampling distribution of sums and difference-Central limit theorem. Point and interval estimation for means and proportions.
	UNIT III: Sampling Theory: Introduction - Population and samples- Sampling distribution of means (σ known)-Central limit theorem- t-distribution- Sampling distribution of means (σ unknown)-Sampling distribution of variances – χ^2 and F-distributions- Point estimation-Maximum error of estimate - Interval estimation.	UNIT III: Tests of Hypothesis Introduction – Statistical hypothesis-Errors of sampling, level of significance - One tail and two-tail tests- Testing of hypothesis concerning single mean, proportion, two means and two proportions using Z-test. Testing of hypothesis concerning single mean, two means using t test. Independence of attributes by χ 2 –test-ANOVA for one-way and two-way classified data.
	UNIT IV: Tests of Hypothesis: Introduction –Hypothesis-Null and Alternative Hypothesis- Type I and Type II errors –Level of significance - One tail and two-tail tests- Tests concerning one mean	UNIT IV: Correlation and Regression Introduction – Simple correlation-properties-Pearson and rank correlation Regression – straight line and quadratic curve by method of least squares.

	and proportion, two means- Proportions and their differences- ANOVA for one-way and two-way classified data.	
	UNIT V: Curve fitting and Correlation: Introduction - Fitting a straight line – Second degree curve-exponential curve-power curve by method of least squares-Goodness of fit. Correlation and Regression – Properties.	UNIT V: Statistical Quality Control Methods Introduction - Methods for preparing control charts – Problems using x-bar, p, R charts and attribute charts
	UNIT VI: Statistical Quality Control Methods: Introduction - Methods for preparing control charts – Problems using x-bar, p, R charts and attribute charts.	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Surveying	SURVEYING
Course Code	R1621015	171CE3T02
Syllabus	UNIT – I, Introduction: definition-Uses of surveying- overview of plane surveying (chain, compass and plane table), Objectives, Principles and classifications – Errors in survey measurements	UNITI Introduction Definition-uses of surveying–objectives-principles, classifications–divisions, units of measurements, conventional symbols, errors in survey measurements. Chain surveying: uses–chain triangulation-survey stations, survey linesinstruments used in chain survey-folding, unfolding- ranging, obstacles-field book errors in chain survey. Compass Surveying: direction of measurements-purpose, principle-prismatic compassandsurveyor'scompass-bearings-meridian-declination-localattraction computation of angle-traversing-types, traverse adjustments
	UNIT – II Distances And Direction: Electronic distance measurements (EDM)- principles of electro optical EDM-Errors and corrections to linear measurements- Compass surveyMeridians, Azimuths and Bearings, declination, computation of angle. Traversing-Purpose-types of traverse-traverse computation-traverse adjustments-Introduction omitted measurements	UNITII Plane table Surveying Purpose-principle-accessories-orientation-methodsofplanetabling-errors. Leveling and Contouring: Concept and Terminology, Leveling Instruments and their Temporary and permanent adjustments- method of leveling. Characteristics and Uses of contours-methods of conducting contour surveys.

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	UNIT – III Leveling And Contouring: Concept and Terminology, Levelling Instruments and their Temporary and permanent adjustments- method of levelling. Characteristics and Uses of contours-methods of conducting contour surveys.	UNIT III Theodolite Theodolite, description, principles-uses and adjustments– temporary and permanent, measurement of horizontal and vertical angles. Trigonometrically leveling. Tacheometric Surveying: Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.
	UNIT – IV Theodolite: Description, principles-uses and adjustments – temporary and permanent, measurement of horizontal and vertical angles. Principles of Electronic Theodolite – Introduction to Trigonometrical leveling,. Tachometric Surveying: Stadia and tangential methods of Tacheometry. Distance and Elevation formulae for Staff vertical position.	UNIT IV Advanced Surveying Total station, electronic distance measurements (EDM)-principles of electrooptical EDM -Global positioning system-introduction to geo detic surveying. Curves: Types of curves, design and setting out simple circular curves by linear and angular methods-introduction to compound curves.
	UNIT – V Curves: Types of curves, design and setting out – simple and compound curvesIntroduction to geodetic surveying, Total St	UNIT V Computation of Areas and Volumes Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level sectiondetermination of the capacity of reservoir, volume of barrow pits
	UNIT – VI Computation Of Areas And Volumes: Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	SURVEYING FIELD WORK-I	Surveying Lab
Course Code	R1621017	171CE3L01
Syllabus	List of Field Works: 1. Survey by chain survey of road profile with offsets in case of road widening. 2. Survey in an area by chain survey (Closed circuit) 3. Determination of distance between two inaccessible points by using compass. 4. Finding the area of the given boundary using compass (Closed Traverse) 5. Plane table survey; finding the area of a given boundary by the method of Radiation 6. Plane table survey; finding the area of a given boundary by the method of intersection. 7. Two Point Problem by the plane table survey. 8. Fly levelling: Height of the instrument method (differential levelling) 9. Fly levelling: rise and fall method. 10. Fly levelling: closed circuit/ open circuit. 11. Fly levelling; Longitudinal Section and Cross sections of a given road profile. Note: Any 10 field work assignments must be completed.	List of field works WEEK1: To find the area by chain survey (closed circuit). WEEK2: To find the area of the given boundary using compass (closed traverse). WEEK3: To find the area of given boundary by method of radiation (plane table survey). WEEK4: To find the level difference by height of instrument methodorrise and fall method (differential leveling). WEEK5: Tofind thelevel difference along the length of the road (longitudinalsection)and draw given road profile(fly leveling). WEEK6: To determine the horizontal and vertical angles by method of repetition (theodolite survey). WEEK7: To find the distance between two in accessible points by theodolite survey & the height and distance problem (Trigonometric leveling). WEEK8: To find Height and distance problems using Tacheometric principles (Tacheometric survey). WEEK9: To set out a simple circular curve by linear method. WEEK10: To prepare a contour map by grid method. WEEK11: To study introduction to total station and practicing, setting up, leveling up, and elimination of parallax error & find the Distance between two in accessible points and determination of remote height (total station). WEEK12: To determine the area using total station. List of Augmented Experiments:(Week13–Week16) (Any two of the following experiments can be performed) WEEK 13: To find the area of given boundary by method of intersection (plane table survey). WEEK 14: To determine the horizontal angles by method of reiteration (theodolite survey). WEEK 15: To find the distance between two in accessible points by compass survey. WEEK16: To find the level difference between two points (simple leveling). To find the Tacheometric constants by tacheometric survey. WEEK 17: To prepare a contour map by using total station

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Strength of Materials Lab	STRENGTH OF MATERIALS LAB
Course Code	R1621018	171ES3L03
Syllabus	List of Experiments 1. Tension test on Steel bar 2. Bending test on (Steel / Wood) Cantilever beam. 3. Bending test on simple support beam. 4. Torsion test 5. Hardness test 6. Spring test 7. Compression test on wood or concrete 8. Impact test 9. Shear test 10. Verification of Maxwell's Reciprocal theorem on beams. 11. Use of Electrical resistance strain gauges 12. Continuous beam – deflection test.	List of Experiments WEEK1: 1.To estimates the mechanical properties of Mild Steel specimen under tensile load by Direct Tension. WEEK2: 2.To estimate the young's modulus of simply supported beam. WEEK3: 3.To estimate young's modulus of cantilever beam. WEEK4: 4.To determine the Rigidity modulus of mild steel specimen by performing Torsion test. WEEK5: 5.To determine the Brinell & Rockwell hardness number of the given specimen. WEEK6: 6.To determine the spring properties (stiffness and rigidity modulus) under tensile and compressive loads. WEEK7: 7.To find the Compressive strength of given wood or concrete. WEEK8: 8.To find the impact strength of mild steel specimen by performing IZOD and Charpy Impact test WEEK9: 9.To determine the ultimate shear strength of mild steel specimen test. WEEK-10: 10.To find the strain of given sample by using electrical resistance straingauge. WEEK-11: 11.To determine young's modulus of different continuousbeams. WEEK-12: 12.To study non destructive testing methods on various materials (Demonstration). List of Augmented Experiments: (Weeks 13 – Week 16) (Any two of the following experiments can be performed) 13. To compare compressive strength of clay brick and reinforced cement concretecube. 14. To verify of Maxwell's Reciprocal theorem onbeams. 15. To perform shear test on givenspecimen. 16. Leaf spring test (Demonstration). 17. To prepare and study the micro structure of pure metals mild steel, low carbon steel and high carbonsteel

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Fluid Mechanics and Hydraulic Machinery Lab	FLUID MECHANICS AND HYDRAULIC MACHINERY LAB
Course Code	R1622017	171CE4L02
Syllabus	List of Experiments 1. Calibration of Venturi meter & Orifice meter 2. Determination of Coefficient of discharge for a small orifice by a constant head method. 3. Determination of Coefficient of discharge for an external mouth piece by variable head method. 4. Calibration of contracted Rectangular Notch and /or Triangular Notch 5. Determination of Coefficient of loss of head in a sudden contraction and friction factor. 6. Verification of Bernoulli's equation. 7. Impact of jet on vanes 8. Study of Hydraulic jump. 9. Performance test on Pelton wheel turbine 10. Performance test on Francis turbine. 11. Efficiency test on centrifugal pump. 12. Efficiency test on reciprocating pump.	List of Experiments WEEK-1: 1.Calibration of Venturi meter & Orifice meter. WEEK-2: 2.To determine the Coefficient of discharge for a small orifice by a constant head method. WEEK-3: 3.Calibration of contracted Rectangular Notch and /or Triangular Notch. WEEK-4: 4.To determine the Coefficient of loss of head in a sudden contraction and friction factor. WEEK-5: 5.To verify the Bernoulli's equation. WEEK-6: 6.To study the impact of jet on various vanes. WEEK-7: 7.To determine the height of jump and head loss in hydraulic jump. WEEK-8: 8.Performance test on Pelton wheel turbine. WEEK-9: 9.Performance test on Francis turbine. WEEK-10: 10.To conduct efficiency test on centrifugal pump. WEEK-11: 11.To conduct efficiency test on reciprocating pump. WEEK-12: 12.Performance test on Kaplan turbine. IV Semester L T P C Course Code: 171CE4L02 0 0 3 2 List of Augmented Experiments: (Week 13 – Week 16) (Any 2 experiments to be conducted from the following) 13. To study the flow phenomenon by using Reynolds's experiment. 14. Calibration of Rotameter. 15. To determine the metacentric height of a floating body. 16. To determine the Coefficient of discharge for an external mouth piece by variable head method. 17. To measure the velocity at a point by using pitot tube apparatus

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Managerial Economics and Financial Analysis	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
Course Code	R1622019	171HS4A04
Syllabus	UNIT-I Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics – Scope of Managerial Economics and its relationship with other subjects –Concept of Demand, Types of Demand, Determinants of DemandDemand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting, Concept of Supply and Law of Supply.	UNIT-I Introduction to Managerial Economics and demand Analysis: Definition of Managerial Economics –Scope of Managerial Economics and its relationship with other subjects – Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting
	UNIT – II: Production and Cost Analysis: Concept of Production function- Cobb-Douglas Production function- Leontief production function - Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total costs – Cost –Volume-Profit analysis-Determination of Breakeven point(simple problems)- Managerial significance and limitations of Breakeven point.	UNIT – II Production and Cost Analyses: Concept of Production function- Cobb-Douglas Production function – Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total costs – Cost –Volume-Profit analysis-Determination of Breakeven point(simple problems)- Managerial significance and limitations of Breakeven point.
	UNIT – III: Introduction to Markets, Theories of the Firm & Pricing Policies: Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Managerial Theories of	UNIT – III Introduction to Markets, Pricing Policies & Types of Business Organization and Business Cycles: Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination

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	firm: Marris and Williamson's models – other Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing: (Flat Rate Pricing, Usage sensitive pricing) and Priority Pricing.	– Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, and Internet Pricing: Flat Rate Pricing, Usage sensitive pricing and Priority Pricing. Features and Evaluation of Sole Trader, Partnership, Joint Stock Company – State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of Business Cycle.
	UNIT – IV: Types of Business Organization and Business Cycles: Features and Evaluation of Sole Trader, Partnership, Joint Stock Company – State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of a Business Cycle.	UNIT – IV Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis
	UNIT – V: Introduction to Accounting & Financing Analysis: Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis – Preparation of Funds flow and cash flow statements (Simple Problems)	UNIT – V Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-CapitalizationMeaning of Capital Budgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods (payback period, accounting rate of return) and modern methods (Discounted cash flow method, Net Present Value method, Internal Rate of Return Method and Profitability Index)
	UNIT – VI: Capital and Capital Budgeting: Capital Budgeting: Meaning of Capital-CapitalizationMeaning of Capital Budgeting-Time value of money-Methods of appraising Project profitability: Traditional Methods(pay back period, accounting rate of return) and modern methods(Discounted cash flow method, Net Present Value method, Internal Rate of Return Method and Profitability Index)	

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Department of Electrical and Electronics Engineering

Syllabus revision Index for 2018-2019

S. No	Name of the course	Percentage of syllabus change
1	Electrical Circuit Analysis - II	40
2	Thermal and Hydro Prime Movers	25
3	Electrical Machines - I Lab	25
4	Pulse & Digital Circuits	25
5	Power Electronics	30
6	Electrical Machines-II Laboratory	30
7	Micro Processors and Micro controllers	40
8	Power Electronics Laboratory	40

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Department of Electrical and Electronics Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Electrical Circuit Analysis - II	Electrical Circuit Analysis - II
Course Code	R1621021	171EE3T02
Syllabus	**UNIT-I Balanced Three phase circuits** Phase sequence- star and delta connection - relation between line and phase voltages and currents - analysis of balanced three phase circuits - measurement of active and reactive power.	**UNIT-I Three Phase circuits:** Phase sequence- star and delta connection - relation between line and phase voltages and currents - analysis of balanced three phase circuits - measurement of active and reactive power. Analysis of three phase unbalanced circuits: Loop method, Star- Delta transformation technique, Millman's Theorem, Two wattmeter methods for measurement of three phase power.
	UNIT-II Unbalanced Three phase circuits Analysis of three phase unbalanced circuits: Loop method – Star-Delta transformation technique, Two wattmeter methods for measurement of three phase power.	**UNIT-II Transient Analysis in DC circuits:** Transient response of R-L, R-C, and R-L circuits of DC excitation, Solutions using Differential equations and Laplace Transforms.
	UNIT-III Transient Analysis in DC and AC Circuits Transient response of R-L, R-C, R-L-C circuits for DC and AC excitations, Solution using differential equations and Laplace transforms.	**UNIT-III Transient Analysis in AC circuits:** Transient response of R-L, R-C, and R-L circuits of AC excitation, Solutions using Differential equations and Laplace Transforms.
	UNIT-IV Two Port Networks Two port network parameters – Z, Y, ABCD and Hybrid parameters and their relations, Cascaded networks - Poles and zeros of network functions.	**UNIT-IV Two Port Networks:** Two Port network parameters-Z, Y, ABCD and Hybrid parameters and their relations, Cascaded networks. Poles and zeros of network functions.
	UNIT-V Network synthesis Positive real function - basic synthesis procedure - LC immittance functions - RC impedance functions and RL	**UNIT-V Network Synthesis:** Positive real functions, Hurwitz polynomials, Realization of passive RL, RC and LC networks using Foster and Cauer forms.

	admittance function - RL impedance function and RC admittance function - Foster and Cauer methods.	
	UNIT-VI Fourier analysis and Transforms Fourier theorem- Trigonometric form and exponential form of Fourier series, Conditions of symmetry- line spectra and phase angle spectra, Analysis of electrical circuits to non-sinusoidal periodic waveforms. Fourier integrals and Fourier transforms – properties of Fourier transform physical significance of the Fourier Transform and its application to electrical circuits.	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Thermal and Hydro Prime Movers	Thermal and Hydro Prime Movers
Course Code	R1621025	171ES3T10
Syllabus	**UNIT I: I.C Engines:** Classification, working principles – valve and port timing diagrams – air standard cycles – Engine systems line fuel injection, carburetion, ignition, cooling and lubrication – Engine performance evaluation.	**UNIT-I Basics of Thermodynamics:** Thermodynamic Systems and State, Process, and Cycle. Laws of Thermodynamics (statements only) - First Law of Thermodynamics and analysis of various thermodynamic processes. **Internal Combustion Engines:** Classification, working principles – Valve and Port timing diagrams – Air standard cycles – Engine systems line fuel injection, Carburetion, Ignition, Cooling and Lubrication– Engine performance evaluation.
	UNIT II: Vapor Power Cycles: Carnot Cycle-Rankine Cycle-Thermodynamic Variables Effecting Efficiency and output of Rankine Cycle-. Analysis of simple Rankine Cycle and Re-heat cycle. **Steam Turbines:** Schematic layout of steam power plant Classification of Steam Turbines- Impulse Turbine and Reaction Turbine- Compounding in Turbines- Velocity Diagrams for simple Impulse and Reaction Turbines- Work done & efficiency	**UNIT-II Vapour Power Cycles:** Carnot cycle, Rankine cycle, Thermodynamic variables effecting efficiency and output of Rankine cycle, Analysis of simple Rankine cycle and Re-heat cycle. **Steam Turbines:** Schematic layout of steam power plant, Classification of Steam Turbines-Impulse Turbine and Reaction Turbine- Compounding in Turbines- Velocity Diagrams for simple Impulse and Reaction Turbines- Work done and efficiency.
	UNIT III: Gas Turbines: Simple gas turbine lant-ideal cycle, closed cycle - open cycle-. Efficiency, Work ratio and optimum pressure ratio for simple gas turbine cycle. Actual cycle, analysis of simple cycles & cycles with inter cooling, reheating and	**UNIT –III Gas Turbines:** Simple gas turbine plant-Ideal cycle, closed cycle - open cycle-. Efficiency, Work ratio and optimum pressure ratio for simple gas turbine cycle. Actual cycle, Analysis of simple cycles with inter Cooling, Reheating and Regeneration.

	Regeneration	
	UNIT IV: Impact of Jets and Pumps: Impulse momentum equation, Impact of Jet on stationary and moving vanes (flat and curved). Pumps: Types of pumps, Centrifugal pumps: Main components, Working principle, Multi stage pumps, Performance and characteristic curves	**UNIT-IV Impact of Jets and Pumps:** Impulse momentum equation, Impact of Jet on stationary and moving vanes (flat and curved). **Pumps:** Types of pumps, Centrifugal pump and Reciprocating Pump: Main components, working principle, Multi stage pumps, Performance and characteristic curves.
	UNIT V: Hydraulic Turbines: Classification of turbines; Working principle, Efficiency calculation and Design principles for Pelton Wheel, Francis and for Kaplan turbines; Governing of turbines; Performance and characteristic curves.	**UNIT-V Hydraulic Turbines:** Classification of turbines; Working principle, Efficiency calculation and Design principles for Pelton Wheel, Francis and Kaplan turbines, Governing of turbines, Performance and characteristic curves. Site selection and layout of Hydro- electric power plant; Components of Hydro- electric power plant.
	UNIT VI: Hydro Power: Components of Hydroelectric power plant: pumped storage systems, Estimation of water power potential; Estimation of load on turbines: load curve, load factor, capacity factor, utilization factor, diversity factor, load – duration curve, firm power, secondary power, prediction of load.	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Electrical Machines -I Laboratory	Electrical Machines - I Lab
Course Code	R1622027	171EE4L03
Syllabus	1.Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed. 2.Brake test on DC shunt motor. Determination of performance curves. 3.Hopkinson's test on DC shunt machines. Predetermination of efficiency. 4.Swinburne's test and Predetermination of efficiencies as Generator and Motor. 5.Speed control of DC shunt motor by Field and armature Control. 6.Retardation test on DC shunt motor. Determination of losses at rated speed. 7.Separation of losses in DC shunts motor. 8.Oc& SC test on single phase transformer. 9.Sumpner's test on single phase transformer. 10.Scott connection of transformers 11.Parallel operation of Single phase Transformers 12.Separation of core losses of a single phase transformer 13.Heat run test on a bank of 3 Nos. of single phase Delta connected transformers	1. To draw open circuit characteristic curves of a given DC shunt generator and to find critical speed & critical field resistance. 2. To draw the performance curves of the D.C shunt motor by conducting brake test. 3. To determine the efficiencies of two identical shunt machines by conducting regenerative test (Hopkinson's test). 4. To find the efficiency of D.C shunt machine by conducting Swinburne's test. 5. To control or change the speed of a given D.C shunt motor by field current control method and armature resistance control method and draw speed curve. 6. To draw the internal & external characteristic curves of the given D.C Shunt generator by conducting load test. 7. To separate the losses in D.C shunt motor. 8. To perform O.C and S.C tests on a single phase transformer and to evaluate efficiency and Regulation and determination of equivalent circuit. 9. To conduct sumpner's test on a two identical single phase transformers and obtain copper losses and core

		losses and evaluate the efficiency. 10. To make scott connection on the given two 1-Ø transformer and verifying the voltage on the secondary side of the Scott connected transformer. **Augmented Experiments** 1. To determine the efficiency of single phase transformer and DC machine by using simulation. 2. To make parallel Operation of Two Identical 1-ØTransformers & Verifying the load Sharing. 3. To separate the hysteresis losses and eddy current losses of a 1-Ø transformer. 4. To draw the internal & external characteristic curves of the given DC cumulative compound generator by conducting load test. 5. To draw the internal & external characteristic curves of the given DC differential compound generator by conducting load test 6. To draw the internal & external characteristic curves of the given D.C Series Generator by conducting load test.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Pulse & Digital Circuits**	**Pulse & Digital Circuits**
Course Code	**RT22023**	**R1631024**
Syllabus	**UNIT-I: Linear Wave Shaping:** High pass, low pass RC circuits-response to sinusoidal, step, pulse, square and ramp inputs. RC circuit as differentiator and integrator. Attenuators: Basic attenuator circuit and compensated attenuator circuit. Switching characteristics of devices: Diode as a switch, transistor as a switch-transistor at cut off, the reverse collector saturation current ICBO, Its variation with the junction temperature. The transistor switch in saturation. Design of transistor switch.	**Unit I: Linear Wave shaping:** High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and exponential inputs. RC network as differentiator and integrator; Attenuators, its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit.
	UNIT-II: Nonlinear wave shaping: Diode clippers, Transistor clipper, clippers at two independent levels-transfer characteristics of clippers-emitter coupled clipper, clamping operation, diode clamping circuits with source resistance and diode resistance -transient and steady state response for a square wave input, clamping circuit theorem-practical clamping circuit.	**UNIT II: Non-Linear Wave Shaping:** Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper; Clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.
	UNIT-III: Multi vibrators: **Bistable multi vibrators:** A basic binary circuit-explanation. Fixed-bias transistor binary, self-biased transistor binary, binary with commutating capacitors-analysis. Non saturated binary–symmetrical triggering, Schmitt trigger circuit-	**UNIT III: Switching Characteristics of Devices:** Diode as a switch, piecewise linear diode characteristics, Design and analysis of Transistor as a switch, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of

	emitter coupled binary circuit. **Monostable multi vibrator:** Basic circuit-collector coupled monostable multivibrator- emitter coupled monostable multivibrator-triggering of monostable multivibrator. **Astable multi vibrator:** The Astable collector coupled multivibrator; the Astable emitter coupled multivibrator.	transistor switch, transistor-switching times. Bistable Multivibrator: Analysis and Design of Fixed Bias, Self-Bias Bistable Multi Vibrator, Collector Catching Diodes, Commutating Capacitors, Triggering of Binary Circuits, Emitter Coupled Bistable Multivibrator (Schmitt Trigger).
	UNIT-IV: Digital logic circuits: Introduction, positive and negative logic, Diode OR gate, Diode AND gate, an inverter circuit with transistor, DTL, TTL, ECL, AOI logic, NMOS logic, PMOS logic, CMOS logic-analysis and problem solving.	**UNIT IV: Monostable Multivibrator**: Analysis and Design of Collector Coupled Monostable Multi vibrator, Triggering of Monostable Multivibrator, Applications of Monostable Multivibrator. Astable Multivibrator: Analysis and Design of Collector Coupled Astable Multivibrator, Application of Astable Multivibrator as a Voltage to Frequency Converter.
	UNIT-V: Time base generators: Voltage time base generators-Introduction, definitions of sweep speed error, displacement error, transmission error, various methods of generating time- base waveforms, UJT time base generator, transistor constant current sweep. Miller time base generators: General considerations, The miller sweep-general considerations of bootstrap time base generator-basic principles, transistor bootstrap time base generator.	**UNIT V: Voltage Time Base Generators:** General features of a time base signal, Methods of generating time base waveform Exponential Sweep Circuits, Negative Resistance Switches, basic principles in Miller and Bootstrap time base generators, Transistor Miller time base generator, Transistor Bootstrap time base generator.
	UNIT-VI: Synchronization and frequency division: Pulse synchronization of relaxation devices, frequency division of the sweep circuit-synchronization of Astable multi, Monostable multivibrator, synchronization of sweep circuit with symmetrical signals-sine wave frequency division with a sweep circuit. **Sampling Gates:** Basic operating principle, Unidirectional diode gate	**UNIT VI: Logic Families & Sampling Gates:** LOGIC FAMILIES: Diode Logic, Transistor Logic, Diode-Transistor Logic, Transistor- Transistor Logic, Emitter Coupled Logic, AOI Logic, Comparison of Logic Families. SAMPLING GATES: Basic Operating Principles of Sampling Gates, Diode Unidirectional Sampling Gate and Two-Diode Bi-Directional Sampling Gate, Four-Diode gates, Six-Diode Gates,

	circuits, bi-directional gates using transistors. A bidirectional diode gate, Four- diode gate.	Reduction of Pedestal in Sampling Gates, Applications of Sampling Gates.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Power Electronics**	**Power Electronics**
Course Code	**RT31025**	**R1631025**
Syllabus	**UNIT–I: Power Semi-Conductor Devices:** Thyristors–Silicon controlled rectifiers (SCR's) –Characteristics of power MOSFET and power IGBT–Basic theory of operation of SCR–Static characteristics– Turn on and turn off methods–Dynamic characteristics of SCR– Snubber circuit design–Numerical problems–Diode bridge rectifier with R–load and capacitive filter–Output voltage and input current waveforms.	**UNIT–I: Power Semi-Conductor Devices:** Thyristors–Silicon controlled rectifiers (SCR's) –Characteristics of power MOSFET and power IGBT–Basic theory of operation of SCR–Static characteristics– Turn on and turn off methods–Dynamic characteristics of SCR– Snubber circuit design– Basic requirements of gating circuits for SCR, IGBT and MOSFET.
	UNIT–II: Phase Controlled Converters – Single Phase Firing circuits for SCR– Line commutation principle– Single phase AC voltage controller with R and RL load–Half wave converters with R, RL and RLE loads– Derivation of average load voltage and current–Effect of freewheeling diode for RL load.	**UNIT–II: AC-DC Single-Phase Converters:** 1-phase half wave-controlled rectifiers – R load and RL load with and without freewheeling diode – 1-phase full wave-controlled rectifiers – center tapped configuration and bridge configuration- R load and RL load with and without freewheeling diode – continuous and discontinuous conduction – Effect of source inductance in 1-phase fully controlled bridge rectifier with continuous conduction.
	UNIT–III: Single Phase Bridge Converter and Harmonic Analysis Fully controlled converters Operation with R, RL and RLE loads–Derivation of average voltage and current – Effect of source Inductance. Semi Converters (Half Controlled): Operation with R, RL and RLE loads	**UNIT–III: AC-DC3-Phase Converters** 3-phase half wave and Full wave uncontrolled rectifier – 3-phase half wave-controlled rectifier with R and RL load – 3-phase fully controlled rectifier with R and RL load – 3-phase semi controlled rectifier with R and RL load.

	– Harmonic analysis for input current waveform in a system with a large load inductance –Calculation of input power factor.	
	UNIT–IV: Three Phase AC–DC Bridge Converters Full converter with R and RL loads– Semi converter (Half Controlled) with R and RL loads– Derivation of load voltage–Line commutated Inverter operation–Dual converters with non–circulating and circulating currents.	**UNIT–IV: DC–DC Converters** Analysis of Buck, boost and buck, buck-boost converters in Continuous Conduction Mode (CCM) , and Discontinuous Conduction Modes (DCM) – Output voltage equations using volt- sec balance in CCM & DCM output voltage ripple & inductor current, ripple for CCM only – Principle operation of forward and fly back converters in CCM.
	UNIT – V: AC–AC and DC–DC Converters: Single phase Bridge type cyclo converter with R and RL load (Principle of operation) –High frequency DC–DC converters: Buck Converter operation– Time ratio control and current limit control strategies–Voltage and current waveforms–Derivation of output voltage–Boost converter operation–Voltage and current waveforms–Derivation of output voltage – Buck-Boost converter operation –Voltage and current waveforms.	**UNIT – V: DC–AC Converters** 1- phase half bridge and full bridge inverters with R and RL loads – 3-phase square wave inverters – 120^0 conduction and 180^0 conduction modes of operation – PWM inverters – Quasi-square wave pulse width modulation – Sinusoidal pulse width modulation – Prevention of shoot through fault in Voltage Source Inverter (VSI) – Current Source Inverter (CSI) – Introduction to Auto Sequential Commutated Current Source Inverter (ASCCSI) .
	UNIT – VI: DC–AC Inverters **Inverters:** Single phase inverters–Unipolar and bipolar switching–Three phase Inverters (120^0 and 180^0 modes of operation) –PWM techniques– Sine triangular PWM technique– amplitude and frequency modulation Indices – Harmonic analysis.	**UNIT – VI: AC – AC Regulators.** Static V-I characteristics of TRIAC and modes of operation – 1-phase AC-AC regulator phase angle control and integrated cycle control with R and RL load – For continuous and discontinuous conduction- 3-Phase AC-AC regulators with R load only – Transformer tap changing using antiparallel Thyristors.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Electrical Machines-II Lab	Electrical Machines-II Laboratory
Course Code	RT31027	R1631026
Syllabus	1.O.C. & S.C. Tests on Single phase Transformer 2.Sumpner's test on single phase transformers 3.Scott connection of transformers 4.No–load & Blocked rotor tests on three phase Induction motor 5.Regulation of a three –phase alternator by synchronous impedance & M.M.F. Methods. 6.V and Inverted V curves of a three—phase synchronous motor. 7.Equivalent Circuit of a single phase induction motor 8.Determination of Xd and Xq of a salient pole synchronous machine **Additional Experiments:** 1.Parallel operation of Single phase Transformers 2.Separation of core losses of a single phase transformer 3.Brake test on three phase Induction Motor 4.Regulation of three–phase alternator by Potier triangle method. 5.Efficiency of a three–phase alternator 6.Heat run test on a bank of 3 Nos. of single phase Delta connected transformers. 7.Measurement of sequence impedance of a three–phase alternator.	1.Brake test on three phase Induction Motor 2.No–load & Blocked rotor tests on three phase Induction motor 3.Regulation of a three –phase alternator by synchronous impedance & MMF. Methods 4.Regulation of three–phase alternator by Potier triangle method 5.V and Inverted V curves of a three—phase synchronous motor. 6.Determination of Xd and Xq of a salient pole synchronous machine 7.Equivalent circuit of single phase induction motor 8.Speed control of induction motor by V/f method. 9.Determination of efficiency of three phase alternator by loading with three phase induction motor. 10.Power factor improvement of single phase induction motor by using capacitors and load test on single phase induction motor.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Microprocessors & Microcontrollers	Micro Processors and Micro controllers
Course Code	1RT32021	R1632023
Syllabus	**UNIT–I: Introduction to Microprocessor Architecture** Introduction and evolution of Microprocessors– Architecture of 8086– Register Organization of 8086–Memory organization of 8086–General bus operation of 8086–Introduction to 80286–80386 and 80486 and Pentium.	**UNIT–I: Introduction to Microprocessor Architecture** Introduction and evolution of Microprocessors– Architecture of 8086–Register Organization of 8086–Memory organization of 8086– General bus operation of 8086–Introduction to 80286–80386 and 80486 and Pentium.
	UNIT–II: Minimum and Maximum Mode Operations Instruction set, addressing modes–Minimum and Maximum mode operations of 8086–8086 Control signal interfacing–Read and write cycle timing diagrams.	**UNIT–II: Minimum and Maximum Mode Operations** Instruction set, addressing modes–Minimum and Maximum mode operations of 8086–8086 Control signal interfacing–Read and write cycle timing diagrams.
	UNIT–III: Assembly Language Programming: Assembly Directives–Macro's–Algorithms for Implementation of FOR Loop–WHILE–REPEAT and IF-THEN-ELSE Features–Addressing modes and Instruction set of 8051–Assembly language programming of 8051– Development systems and tools.	**UNIT–III: I/O Interface** 8255 PPI– Architecture of 8255–Modes of operation– Interfacing I/O devices to 8086 using 8255–Interfacing A to D converters– Interfacing D to A converters– Stepper motor interfacing–Static memory interfacing with 8086–DMA controller (8257)–Architecture–Interfacing 8257 DMA controller–Programmable Interrupt Controller (8259)–Command words and operating modes of 8259– Interfacing of 8259–Keyboard/display controller (8279)–Architecture–Modes of operation–Command words of 8279– Interfacing of 8279.

	UNIT–IV: I/O Interface 8255 PPI– Architecture of 8255–Modes of operation– Interfacing I/O devices to 8086 using 8255–Interfacing A to D converters–Interfacing D to A converters– Stepper motor interfacing– Static memory interfacing with 8086– DMA controller (8257)–Architecture–Interfacing 8257 DMA controller–Programmable Interrupt Controller (8259)–Command words and operating modes of 8259– Interfacing of 8259–Keyboard/display controller (8279)– Architecture–Modes of operation–Command words of 8279–Interfacing of 8279.	**UNIT–IV: Introduction to 8051 Micro Controller** Overview of 8051 Micro Controller–Architecture– Register set–I/O ports and Memory Organization– Interrupts–Timers and Counters–Serial Communication.
	UNIT–V: Introduction to 8051 Micro Controller Overview of 8051 Micro Controller–Architecture– Register set–I/O ports and Memory Organization–Interrupts–Timers and Counters–Serial Communication.	**UNIT– V: PIC Architecture** Block diagram of basic PIC 18 micro controller, registers I/O ports.
	UNIT– VI: Cyber physical systems and industrial applications of 8051 Applications of Micro Controllers–Interfacing 8051 to LED's–Push button– Relay's and Latch Connections– Keyboard Interfacing–Interfacing Seven Segment Display–ADC and DAC Interfacing.	**UNIT– VI: Programming in C for PIC:** Data types, I/O programming, logical operations, data conversion

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Power Electronics Lab	Power Electronics Laboratory
Course Code	RT32027	R1632026
Syllabus	1.Study of Characteristics of SCR, MOSFET & IGBT 2.Gate firing circuits for SCR's 3.Single -Phase Half controlled converter with R and RL load 4.Single -Phase fully controlled bridge converter with R and RL loads 5.Single -Phase AC Voltage Controller with R and RL Loads 6.Single -Phase Cyclo–converter with R and RL loads 7.Single -Phase Bridge Inverter with R and RL Loads 8.Single -Phase dual converter with RL loads 9.Three -Phase half-controlled bridge converter with RL load. 10.Three- Phase full converter with RL–load. 11.DC–DC buck converter. 12.DC–DC boost converter. 13.Single -phase PWM inverter. 14.Single -phase diode bridge rectifier with R load and capacitance filter. 15.Forced commutation circuits (Class A, Class B, Class C, Class D and Class E)	1. Study of Characteristics of Thyristor, MOSFET & IGBT. 2. Design and development of a firing circuit for Thyristor. 3. Design and development of gate drive circuits for IGBT. 4. Single -Phase Half controlled converter with R and RL load 5. Single -Phase fully controlled bridge converter with R and RL loads 6. Single -Phase AC Voltage Regulator with R and RL Loads 7. Single -Phase square wave bridge inverter with R and RL Loads 8. Three- Phase fully controlled converter with RL–load. 9. Design and verification of voltages gain of Boost converter in Continuous Conduction Mode (CCM) and Discontinuous Conduction Mode (DCM). 10. Design and verification of voltages ripple in buck converter in CCM operation. 11. Single -phase PWM inverter with sine triangle PWM technique. 12. 3-phase AC-AC voltage regulator with R-load.

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Department of Mechanical Engineering

Syllabus revision Index (2018-19)

S. No	Name of the course	Percentage of syllabus change
1	Mechanics of solids	22
2	BEEE Lab	20
3	MOS and MMS Lab	20
4	Design of Machine Members – I	20
5	Industrial Engineering and Management	26
6	Machine Drawing	30
7	PT Lab	20
8	FM &HM Lab	24

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Department of Mechanical Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Mechanics of Solids**	**Mechanics of Solids**
Course Code	**R1621032**	**171ES3T11**
Syllabus	**UNIT-I:** **Simple Stresses & Strains:** Elasticity and plasticity – Types of stresses & strains–Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Bars of varying section – composite bars – Temperature stresses- Complex Stresses - Stresses on an inclined plane under different uniaxial and biaxial stress conditions - Principal planes and principal stresses - Mohr's circle - Relation between elastic constants, Strain energy – Resilience – Gradual, sudden, impact and shock loadings.	**UNIT-I:** **Simple Stresses & Strains:** Elasticity and plasticity – Types of stresses & strains–Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio & Volumetric strain – Bars of varying section – Composite bars – Temperature stresses - Relation between elastic constants- Strain energy – Resilience – Gradual, Sudden, Impact and Shock loadings.
	UNIT-II: **Shear Force and Bending Moment:** Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, u.d.l, uniformly varying loads and combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.	**UNIT-II:** **Analysis of Plane Trusses and Frames:** Method of sections - Method of joints. Shear Force and Bending Moment: Definition of beam – Types of beams – Concept of shear force and Bending moment – S.F and B.M diagrams for Cantilever, simply supported and Overhanging beams subjected to point loads, uniformly distributing loads, uniformly varying loads, Simple couples, Eccentric loads and combination of these loads – Point of contra flexure – Relation between S.F, B.M and rate of loading at a section of a beam.

	UNIT-III: **Flexural Stresses:** Theory of simple bending – Assumptions – Derivation of bending equation: M/ I = f/y = E/R Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections. SHEAR STRESSES: Derivation of formula – Shear stress distribution across various beams sections like rectangular, circular, triangular, I, T angle sections.	**UNIT-III:** **Flexural Stresses:** Theory of simple bending – Assumptions – Derivation of bending equation: M/ I = f/y = E/R Neutral axis – Determination bending stresses – Section modulus of rectangular and circular sections (Solid and Hollow), I-section, T-section, Angle and Channel sections – Design of simple beam sections. Shear Stresses: Derivation of formula – Shear stress distribution across various beams sections like Rectangular, Circular, Triangular, I-section, T-section, Angle sections.
	UNIT-IV: **Deflection of Beams**: Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L uniformly varying load. Mohr's theorems – Moment area method – application to simple cases including overhanging beams, Statically Indeterminate Beams and solution methods.	**UNIT-IV:** **Deflection of Beams:** Bending into a circular arc – Slope, Deflection and Radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads – Uniformly distributing loads – Uniformly varying load. Mohr's theorems – Moment area method – Application to simple cases including overhanging beams.
	UNIT-V: **Thin Cylinders:** Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Riveted boiler shells – Thin spherical shells. **Thick Cylinders:** Lame's equation – cylinders subjected to inside & outside pressures –compound cylinders.	**UNIT-V:** **Torsion:** Introduction – Derivation – Torsion of Circular shafts – Pure Shear – Transmission of power by circular shafts, Shafts in series, Shafts in parallel. **Columns:** Buckling and Stability, Columns with Pinned ends, Columns with other support conditions, Limitations of Euler's Formula, Rankine's Formula.

	UNIT-VI: **Torsion**: Introduction-Derivation- Torsion of Circular shafts- Pure Shear-Transmission of power by circular shafts, Shafts in series, Shafts in parallel. **Columns:** Buckling and Stability, Columns with Pinned ends, Columns with other support Conditions, Limitations of Euler's Formula, Rankine's Formula	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Electrical and Electronics Engineering Lab	Basic Electrical and Electronics Engineering Lab
Course Code	R1621036	171ES3L05
Syllabus	**List of Experiments:** 1. Swinburne's test on D.C. Shunt machine (Predetermination of efficiency of a given D.C.Shunt machine working as motor and generator). 2. OC and SC tests on single phase transformer (Predetermination of efficiency and regulation at given power factors). 3. Brake test on 3-phase Induction motor (Determination of performance characteristics) 4. Regulation of alternator by Synchronous impedance method. 5. Speed control of D.C. Shunt motor by a. Armature Voltage control b) Field flux control method 6. Brake test on D.C. Shunt Motor.	**List of Experiments:** 1. To determine the efficiency of a given D.C.Shunt machine working as motor and generator (Swinburne's test on D.C. Shunt machine.) 2. To determine the efficiency and regulation of single phase transformer at given power factors (OC and SC tests on single phase transformer). 3. To obtain the performance characteristics of 3-phase Induction motor (Brake test). 4. To obtain the regulation of alternator by Synchronous impedance method. 5. To conduct the Speed control test on D.C. Shunt motor by 6. a) Armature Voltage control b) Field flux control method 7. To obtain the performance characteristics of D.C Shunt Motor (Brake test).
	1. PN junction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and resistance calculations) 2. Transistor CE characteristics (Input and output) 3. Half wave rectifier with and with out filters. 4. Full wave rectifier with and with out filters. 5. CE amplifiers.	1. The following experiments are required to be conducted as compulsory experiments: 2. To draw the PN junction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and resistance calculations) 3. To obtain the CE characteristics of transistor (Input and output) 4. To find out the characteristics of half wave rectifier with and without filters.

	6. OP- Amp applications (inverting, non inverting, integrator and differentiator)	5. To find out the characteristics of full wave rectifier with and without filters. 6. To draw the frequency response of CE amplifiers. 7. To obtain the OP- Amp applications (inverting, non inverting, integrator and differentiator)
		1. To make scott connection on the given two 1-ø transformer and verifying the voltage on the secondary side of the Scott connected transformer. 2. To Verify of Parallel Operation of Two Identical 1- ø Transformers 3. To separate the hysteresis losses and eddy current losses of a 1- ø transformer

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Mechanics of Solids& Metallurgy Lab	Mechanics of Solids& Metallurgy Lab
Course Code	R1621037	171ES3L06
	List of Experiments 1. Direct tension test 2. Bending test on a) Simple supported b) Cantilever beam 3. Torsion test 4. Hardness test a) Brinells hardness test b) Rockwell hardness test 5. Test on springs 6. Compression test on cube 7. Impact test 8. Punch shear test	**List of Experiments** 1. To conduct direct tension test on mild steel bar. 2. To conduct bending test on Simple supported beam & Cantilever beam. 3. To determine Modulus of rigidity of given specimen by conducting Torsion test on circular shafts 4. To determine hardness value for the given metal specimen using a) Brinell hardness tester b) Rockwell hardness tester. 5. To determine the compression strength on cube by a) UTM b) CTM
Syllabus	1. Preparation and study of the Micro Structure of pure metals like Iron, Cu and Al 2. Preparation and study of the Microstructure of Mild steels, low carbon steels, high – C steels. 3. Study of the Micro Structures of Cast Irons. 4. Study of the Micro Structures of Non-Ferrous alloys. 5. Study of the Micro structures of Heat-treated steels. 6. Hardenability of steels by Jominy End Quench Test. 7. To find out the hardness of various treated and untreated steels.	1. To study the Micro Structure of pure metals like Iron, Cu and Al. 2. To study the Microstructure of Mild steels, low carbon steels, high – C steels. 3. To Study the Micro Structures of Cast Irons and Non-Ferrous alloys. 4. To Study the Micro structures of Heat-treated steels. 5. To determine the harden ability of steels by Jominy End Quench Test.

		1. To conduct Impact test by a) Izod test. b) Charpy test 2. To find shear strength on given specimen by Punch shear test 3. To determine the maximum shear stress induced in circular beam
		1. To find out the hardness of various treated and untreated steels. 2. To study the microstructure of high speed steels. 3. To find the increase in hardness values for the given steel alloys (EN8) specimen by (oil quenching) medium hardening method.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Design of Machine Members – I**	**Design of Machine Members – I**
Course Code	**R1622034**	**171ME4T05**
Syllabus	**UNIT-I:** **Introduction:** General considerations in the design of Engineering Materials and their properties – selection – Manufacturing consideration in design, tolerances and fits –BIS codes of steels. **Stresses in Machine Members:** Simple stresses – combined stresses – torsional and bending stresses – impact stresses – stress strain relation – various theories of failure – factor of safety – design for strength and rigidity – preferred numbers. the concept of stiffness in tension, bending, torsion and combined situations – static strength design based on fracture toughness.	**UNIT-I:** **Introduction to Machine Design:** Introduction to machine design- Engineering Materials and their properties – selection –Manufacturing considerations in design- Preferred numbers- BIS Codes – Combined Stresses - Complex Stresses - Stresses on an inclined plane under different uniaxial and biaxial stress conditions - Principal planes and principal stresses - Mohr's circle various theories of failure
	UNIT-II:. **Strength of Machine Elements:** Stress concentration – theoretical stress concentration factor – fatigue stress concentration factor notch sensitivity – design for fluctuating stresses – endurance limit – estimation of endurance strength – Goodman's line – Soderberg's line – modified Goodman's line.	**UNIT-II:** **Design Under Fluctuating Stresses:** Stress concentration –Theoretical Stress Concentration Factor – Fatigue Stress Concentration Factor - Notch Sensitivity – Design for fluctuating stresses – Endurance limit –Estimation of endurance strength – Goodman's line – Soderberg's line – Modified Goodman's line.
	UNIT-III: **Riveted and welded joints:** Design of joints with initial stresses – eccentric loading. Bolted joints – design of bolts with pre-stresses – design of joints under eccentric loading – locking devices – both of uniform strength, different seals	**UNIT-III:** **Design of Keys and Couplings:** Design of keys-stresses in keys- Rigid couplings – Muff, Split muff and Flange couplings-Flexible couplings – Flange coupling (Modified). Cotter & Knuckle Joints: Spigot and socket, Sleeve and cotter, Jib and cotter joints-Knuckle joints

	UNIT-IV: **Keys, Cotters And Knuckle Joints:** Design of keys-stresses in keys-cotter joints-spigot and socket, sleeve and cotter, jib and cotter joints-knuckle joints. **Shafts:** Design of solid and hollow shafts for strength and rigidity – design of shafts for combined bending and axial loads – shaft sizes – BIS code. Use of internal and external circlips, gaskets and seals (stationary & rotary).	**UNIT-IV:** **Design of Fasteners:** Riveted and welded joints – Design of joints with initial stresses – Eccentric loading. Bolted joints – Design of bolts with pre-stresses – Design of joints under eccentric loading – Locking devices – Bolts of uniform strength, Different seals.
	UNIT-V: **Shaft Coupling:** Rigid couplings – muff, split muff and flange couplings, flexible couplings – flange coupling (modified).	**UNIT-V:** **Springs:** Stresses and deflections of helical springs – Extension -Compression springs – Springs for fatigue loading, Energy storage capacity – Helical torsion springs – Coaxial springs, Leaf springs. **Pressure Vessels:** Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – Hoop, Longitudinal and Volumetric strains – Changes in diameter and volume of thin cylinders – Riveted boiler shells – Thin spherical shells Thick Cylinders-Lame's equation – Cylinders subjected to inside & outside pressures – Compound cylinders.
	UNIT-VI: **Mechanical Springs:** Stresses and deflections of helical springs – extension -compression springs – springs for fatigue loading, energy storage capacity – helical torsion springs – co-axial springs, leaf springs.	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Industrial Engineering and Management	Industrial Engineering and Management
Course Code	R1622036	171ME4T06
Syllabus	**UNIT-I:** **Introduction:** Definition of industrial engineering (I.E), development, applications, role of an industrial engineer, differences between production management and industrial engineering, quantitative tools of IE and productivity measurement. concepts of management, importance, functions of management, scientific management, Taylor's principles, theory X and theory Y, Fayol's principles of management.	**UNIT-I:** **Introduction:** Definition of industrial engineering (I.E), development, applications, role of an industrial engineer, differences between production management and industrial engineering, quantitative tools of I.E., and productivity measurement. Concepts of management, importance, functions of management, scientific management, Taylor's principles, theory X and theory Y, Fayol's principles of management.
	UNIT-II:. **Plant Layout:** Factors governing plant location, types of production layouts, advantages and disadvantages of process layout and product layout, applications, quantitative techniques for optimal design of layouts, plant maintenance, preventive and breakdown maintenance.	**UNIT-II:** **Plant Layout:** Factors governing plant location, types of production layouts, advantages and disadvantages of process layout and product layout, applications, quantitative techniques for optimal design of layouts, plant maintenance, preventive and breakdown maintenance. **Industrial Safety:** Safety Training Hazard checklist, Human Factors in Machine equipment safety, Precautions in maintenance work, Safety in material handling and storage. Installation, Lubrication, General maintenance of machine tools, Breakdown maintenance and remedies.
	UNIT-III: **Operations Management:** Importance, types of production, applications, workstudy, method study and time study, work sampling, PMTS, micro-motion study, rating techniques, MTM, work factor	**UNIT-III:** **Operations Management:** Importance, types of production, applications, work study, method study and time study, work sampling, PMTS, micro-motion study, rating techniques, MTM, work factor system,

	system, principles of Ergonomics, flow process charts, string diagrams and Therbligs	principles of Ergonomics, flow process charts, string diagrams and Therbligs.
	UNIT-IV: **Statistical Quality Control:** Quality control, its importance, SQC, attribute sampling inspection with single and double sampling, Control charts – X and R – charts X AND S charts and their applications, numerical examples. **Total Quality Management:** Zero defect concept, quality circles, implementation, applications, ISO quality systems. six sigma – definition, basic concepts	**UNIT-IV:** **Statistical Quality Control:** Quality control, its importance, SQC, attribute sampling inspection with single and double sampling, Control charts, X bar and R charts X bar and S charts, P charts, NP charts and their applications, numerical examples
	UNIT-V: **Resource Management:** Concept of human resource management, personnel management and industrial relations, functions of personnel management, Job-evaluation, its importance and types, merit rating, quantitative methods, wage incentive plans, types. II	**UNIT-V:** **Resource Management:** Concept of human resource management, personnel management and industrial relations, functions of personnel management, Job-evaluation, its importance and types, merit rating, quantitative methods, wage incentive plans, types. **Project Management:** PERT, CPM – differences & applications, critical path, determination of floats, importance, project crashing and numerical examples.
	UNIT-VI: **VALUE ANALYSIS:** Value engineering, implementation procedure, enterprise resource planning and supply chain management. **Project Management:** PERT, CPM – differences & applications, critical path, determination of floats, importance, project crashing, smoothing and numerical examples.	

Course Coordinator

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Machine Drawing	Machine Drawing
Course Code	R1622035	171ME4T07
	Machine Drawing Conventions : Need for drawing conventions – introduction to IS conventions A. Conventional representation of materials, common machine elements and parts such asscrews, nuts, bolts,keys, gears, webs, ribs. B. Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned. C. Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers, curved and tapered features. D. Title boxes, their size, location and details - common abbreviations & their liberal usage E. Types of Drawings – working drawings for machine parts.	Machine Drawing Conventions: A.Need for drawing conventions – introduction to standard conventions Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs. B. Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned. C. Drawing of machine elements and simple parts Selection of views, additional views for the following machine elements and parts with easy drawing proportions i) Standard forms of screw threads, bolts, nuts, stud bolts, tap bolts, set screws. ii) Keys, cotter joint and knuckle joint. iii) Riveted joints for plates iv) Shaft coupling, spigot and socket pipe joint. v) Journal bearing and foot step bearing.
	I. Drawing of Machine Elements and simple parts Selection of Views, additional views for the following machine elements and parts with every drawing proportions. a) Popular forms of Screw threads, bolts, nuts, stud bolts, tap bolts, set screws.	

	b) Keys, cotter joints and knuckle joint. c) Riveted joints for plates d) Shaft coupling, spigot and socket pipe joint. e) Journal, pivot and collar and foot step bearings.	
	II. Assembly Drawings: Drawings of assembled views for the part drawings of the following using conventions and easy drawing proportions. a) Engine parts –Gear pump, Fuel pump Petrol Engine connecting rod, piston assembly. b) Other machine parts - Screws jacks, Machine Vices Plummer block, Tailstock. c) Valves: spring loaded safety valve, feed check valve and air cock, Control valves	**Assembly Drawings:** Drawings of assembled views for the part drawings of the following using conventions and easy drawing proportions. A) Engine parts – eccentric, petrol engine connecting rod, piston assembly. B) Other machine parts - screw jack, machine vice, Plummer block, lathe tailstock. C) Valves- steam stop valve, non return valve and feed check valve.
		Production Drawing (only for Practice, not for Examination): Introduction to Limits, Fits& Tolerances, Types of Assembly systems Importance of BOM. Part drawing procedure, construction of part drawings from the given assembly drawings using conventions and easy drawing proportions. Part drawings of Eccentric, Single tool post, Plummer block, Screw Jack.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Production Technology Lab**	**Production Technology Lab**
Course Code	**R1622038**	**171ME4L01**
Syllabus	**List of Experiments:** **Metal Casting :** 1. Pattern Design and making - for one casting drawing. 2. Sand properties testing - for strength and permeability 3. Mould preparation, Melting and Casting	**List of Experiments:** 1. To design and manufacture a Wooden Pattern for a given Casting. 2. To prepare a Casting for the given Solid Pattern using Green Sand Molding Processes. 3. To Prepare a Aluminum Casting for the given Split Pattern using Green Sand Molding Processes.
	Welding: 1. Gas welding 2. Gas cutting 3. Manual metal arc welding - Lap & Butt Joints 4. TIG/MIG Welding 5. Resistance Spot Welding 6. Brazing and soldering	1. To prepare a V – Butt & Lap Joint Joint using Arc Welding Process 2. To prepare a lap Joint on the given work pieces using spot welding equipment. 3. To prepare a V – Butt Joint Using TIG Welding.
	Metal Forming and Powder Metallurgy: 1. 1.Blanking & Piercing operations and study of simple, compound and progressive dies. 2. Deep drawing and extrusion operations. 3. Bending and other operations 4. 4. Basic powder compaction and sintering	1. To perform the punching and blanking operation. 2. To prepare a work piece using Compound die

	Processing of Plastics 1. Injection Moulding 2. Blow Moulding	1. To perform Bending Operation on a given pipe.
		2. To prepare a plastic bottle by using Blow Moulding

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Fluid Mechanics & Hydraulic Machines Lab	Fluid Mechanics & Hydraulic Machines Lab
Course Code	R1622037	171ES4L07
Syllabus	**List of Experiments** 1. Impact of jets on Vanes. 2. Performance Test on Pelton Wheel. 3. Performance Test on Francis Turbine. 4. Performance Test on Kaplan Turbine. 5. Performance Test on Single Stage Centrifugal Pump. 6. Performance Test on Multi Stage Centrifugal Pump. 7. Performance Test on Reciprocating Pump. 8. Calibration of Venturimeter. 9. Calibration of Orifice meter. 10. Determination of friction factor for a given pipe line. 11. Determination of loss of head due to sudden contraction in a pipeline. 12. Turbine flow meter.	**List of Experiments** 1. To determine the of major losses (friction factor) in pipes 2. To determine the minor losses in pipes 3. To determine the of co-efficient of discharge of a Venturi meter 4. To determine the of co-efficient of discharge of an Orifice meter 5. To determine the Discharge and efficiency of a Centrifugal pump 6. To determine the Discharge and efficiency of a Reciprocating pump 7. To determine the Head, Discharge and efficiency of a Pelton wheel. 8. To determine the Head, Discharge and efficiency of a Francis turbine 9. To determine the Head, Discharge and efficiency of a Kaplan turbine 10. To determine the velocity of flow at any point in a pipe using Pitot tube

		11. To verify the Bernoulli's theorem using experimental setup . 12. To find the Laminar and Turbulent flow types using Reynolds's Experiment. 13. To determine the co-efficient of discharge of a Rota meter. 14. To determine the co-efficient of the discharge of a water meter

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Department of Electronics and communication Engineering

Syllabus revision Index

2018-19

S.No	Name of the course	Percentage of syllabus change
1	Managerial Economics and Financial Analysis	20%
2	Electronic Devices and Circuits Lab	20%
3	Networks and Electrical Technology Lab	20%
4	Analog Communications Lab	50%
5	Digital I C Applications	33%
6	Digital I C Applications Lab	30%
7	VLSI Lab	20%

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Department of Electronics and communication Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Managerial Economics & Financial Analysis	Managerial Economics & Financial Analysis
Course Code	R1621026	171HS3T04
Syllabus	**UNIT-I** **Introduction to Managerial Economics and demand Analysis:** Definition of Managerial Economics – Scope of Managerial Economics and its relationship with other subjects – Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting..	**UNIT-I** **Introduction to Managerial Economics and demand Analysis:** Definition of Managerial Economics – Scope of Managerial Economics and its relationship with other subjects – Concept of Demand, Types of Demand, Determinants of Demand- Demand schedule, Demand curve, Law of Demand and its limitations- Elasticity of Demand, Types of Elasticity of Demand and Measurement- Demand forecasting and Methods of forecasting
	UNIT – II **Production and Cost Analyses:** Concept of Production function- Cobb-Douglas Production function- Leontief production function - Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale- Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total costs –Cost – Volume-Profit analysis-Determination of Breakeven point(simple problems)- Managerial significance and limitations of Breakeven point.	**UNIT – II** **Production and Cost Analyses:** Concept of Production function- Cobb-Douglas Production function – Law of Variable proportions-Isoquants and Isocosts and choice of least cost factor combination-Concepts of Returns to scale and Economies of scale-Different cost concepts: opportunity costs, explicit and implicit costs- Fixed costs, Variable Costs and Total costs – Cost –Volume-Profit analysis-Determination of Breakeven point(simple problems)- Managerial significance and limitations of Breakeven point.
	UNIT – III **Introduction to Markets, Theories**	**UNIT – III** **Introduction to Markets, Pricing**

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	of the Firm & Pricing Policies: Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price andOutput Determination – Managerial Theories of firm: Marris and Williamson's models – other Methods of Pricing:Average cost pricing, Limit Pricing, Market Skimming Pricing, Internet Pricing: Flat Rate Pricing, Usage sensitive pricing and Priority Pricing.	**Policies:** Market Structures: Perfect Competition, Monopoly, Monopolistic competition and Oligopoly – Features – Price and Output Determination – Methods of Pricing: Average cost pricing, Limit Pricing, Market Skimming Pricing, and Internet Pricing: Flat Rate Pricing, Usage sensitive pricing and Priority Pricing.
	UNIT – IV **Types of Business Organization and Business Cycles:**Features and Evaluation of Sole Trader, partnership, Joint Stock Company – State/Public Enterprises and their forms – Business Cycles : Meaning and Features – Phases of Business Cycle.	**UNIT – IV** **Introduction to Accounting & Financing Analysis:** Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis
	UNIT – V **Introduction to Accounting & Financing Analysis:** Introduction to Double Entry Systems – Preparation of Financial Statements-Analysis and Interpretation of Financial Statements-Ratio Analysis – Preparation of Funds flow and cash flow statements (Simple Problems)	**UNIT – V** **Capital and Capital Budgeting:** Capital Budgeting: Meaning of Capital-Capitalization-Meaning of Capital Budgeting-Time value of money-Methods of appraising Project profitability: Traditional Methods (payback period, accounting rate of return) and modern methods (Discounted cash flow method, Net Present Value method, Internal Rate of Return Method and Profitability Index)
	UNIT – VI **Capital and Capital Budgeting:** Capital Budgeting: Meaning of Capital-Capitalization-Meaning of CapitalBudgeting-Time value of money- Methods of appraising Project profitability: Traditional Methods(pay back period,accounting rate of return	

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Department of Electronics and communication Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Electronic Devices and Circuits Lab	Electronic Devices and Circuits Lab
Course Code	R1621046	171EC3L01
Syllabus	**List of Experiments: (Minimum of Ten Experiments has to be performed)** 1. P-N Junction Diode Characteristics Part A: Germanium Diode (Forward bias& Reverse bias) Part B: Silicon Diode (Forward Bias only) 2. Zener Diode Characteristics Part A: V-I Characteristics Part B: Zener Diode as Voltage Regulator 3. Rectifiers (without and with c-filter) Part A: Half-wave Rectifier Part B: Full-wave Rectifier 4. BJT Characteristics(CE Configuration) Part A: Input Characteristics Part B: Output Characteristics 5. FET Characteristics(CS Configuration) Part A: Drain Characteristics Part B: Transfer Characteristics 6. SCR Characteristics 7. UJT Characteristics 8. Transistor Biasing 9. CRO Operation and its Measurements 10. BJT-CE Amplifier 11. Emitter Follower-CC Amplifier 12. FET-CS Amplifier	**List of Experiments: (Minimum of Ten Experiments has to be performed)** Week 1. Draw the V-I characteristics of a P-N Junction Diode (Ge &Si). Week 2. Draw the V-I characteristics of a Zener Diode. Week 3. Verify the operation of Zener Diode as a voltage regulator. Week 4. Calculate the Ripple factor and percentage of Regulation of Half-wave Rectifier (without and with filter) Week 5. Calculate the Ripple factor and percentage of Regulation of Full-wave Rectifier (without and with filter) Week 6. Determine the Input and Output Characteristics of BJT-CE Configuration. Week 7. Obtain the Drain and Transfer Characteristics of FET-CS Configuration. Week 8. Identify the negative resistance region of UJT. Week 9. Measure the voltage and frequency of given wave form using CRO. Week 10. Obtain the frequency response of BJT-CE Amplifier. Week 11. Obtain the frequency response of Emitter Follower-CC Amplifier Week 12. Obtain the frequency response of FET-CS Amplifier. **List of Augmented Experiments**

		(Week 13 &14) **(Any two of the following Experiments can be performed)** 1. Determine the Input and Output Characteristics of BJT-CB Configuration. 2. Obtain the frequency response of BJT-CB Amplifier.. 3. Verify the operation of series and shunt voltage regulators. 4. Draw the V-I Characteristics of SCR. 5. Obtain the quiescent point of given self bias transistor circuit.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Networks and Electrical Technology Lab	Networks and Electrical Technology Lab
Course Code	R1621047	171ES3L08
Syllabus	**PART – A** **Any five experiments are to be conducted from each part** 1. Series and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network. 2. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination. 3. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification. 4. Verification of Superposition and Reciprocity theorems. 5. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads. 6. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test. **PART – B** 1. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance. 2. Speed control of D.C. Shunt motor by Armature & flux control methods 3. Brake test on DC shunt motor. Determination of performance characteristics. 4. OC & SC tests on Single-phase	**PART – A** **Any five experiments are to be conducted from each part** Week 1. Series and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network. Week 2. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination. Week 3. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification. Week 4. Verification of Superposition and Reciprocity theorems. Week 5. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads. Week 6. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test. **PART – B** Week 7. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance. Week 8. Speed control of D.C. Shunt motor by Armature & flux control methods Week 9. Brake test on DC shunt motor.

	transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit). 5. Brake test on 3-phase Induction motor (performance characteristics). 6. Regulation of alternator by synchronous impedance method	Determination of performance characteristics. Week 10. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit). Week 11. Brake test on 3-phase Induction motor (performance characteristics). Week 12. Regulation of alternator by synchronous impedance method. **List of Augmented experiments (Week 13 &14)** **(Any one of the following experiments can be performed)** 1. To make scott connection on the given two 1-phase transformer and verifying the voltage on the secondary side of the Scott connected transformer. 2. Verification of Parallel Operation of Two Identical 1- phase Transformers 3. To separate the hysteresis losses and eddy current losses of a 1- phase transformer

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Department of Electronics and communication Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Analog Communications Lab	Analog Communications Lab
Course Code	R1622047	171EC4L03
Syllabus	List of Experiments (Twelve experiments to be done- **The students have to calculate the relevant parameters**) - (a. Hardware, b. MATLAB Simulink, c. MATLAB Communication tool box) A. Amplitude Modulation - Mod. & Demod. B. AM - DSB SC - Mod. & Demod. C. Spectrum Analysis of Modulated signal using Spectrum Analyser D. Diode Detector E. Pre-emphasis & De-emphasis F. Frequency Modulation - Mod. & Demod. G. AGC Circuits H. Sampling Theorem I. Pulse Amplitude Modulation - Mod. & Demod. J. PWM , PPM - Mod. & Demod. K. PLL L. Radio receiver characteristics	**List of Experiments:** (Minimum ten experiments to be done by using Hardware as well as MATLAB Simulink and Communication toolbox). Week1. Generate amplitude modulated signal and determine the percentage modulation and also demodulate the modulated signal using envelope detector. Week2. Generate AM-DSB SC Modulated signal and Demodulate the modulated signal using coherent detection. Week3. Generate AM-SSB SC Modulated signal and Demodulate the modulated signal using coherent detection Week4. Generate frequency modulated signal and determine the modulation index and bandwidth and also demodulate a Frequency Modulated signal using PLL. Week5. Verify the AGC characteristics of an AF amplifier. Week6. Plot the frequency response of the pre-emphasis and de-emphasis circuits. Week7. Generate the waveforms of different types of signal sampling and its reconstruction. Week8. Analyze the process of pulse Amplitude Modulation & Demodulation Techniques and the effect of amplitude

		of the modulating signal on the output. Week9. Generate pulse width and pulse position modulation and demodulation signals and study the effect of amplitude of the modulating signal on output Week10. Calculate the bandwidth of amplitude modulated and frequency modulated signals using Spectrum Analyzer. Week11. Experimentally study the characteristics of Radio receiver. **List of Augmented Experiments (Week 12 & 13)** **(Any two of the following Experiments can be performed)** 1. Determine the input amplitude response on the output of a squelch circuit. 2. Experimentally study the characteristics of a given mixer circuit. 3. Experimentally study the process of frequency division multiplexing and demultiplexing circuits and verify its operation. 4. Simulate the response of ring modulator using MATLAB Simulink. 5. Simulate the response of Foster Seeley Discriminator using MATLAB Simulink. 6. Simulate the effect of demodulator on modulation index of received AM signal using MATLAB Simulink.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	DIGITAL SYSTEM DESIGN & DIGITAL IC APPLICATIONS	Digital IC Applications
Course Code	RT31044	R1631042
SYLLABUS	**Unit-I:** **Digital Design Using HDL:** Design flow, program structure, History of VHDL, VHDL requirements, Levels of Abstraction, Elements of VHDL, Concurrent and Sequential Statements, Packages, Libraries and Bindings, Objects and Classes, Subprograms, Comparison of VHDL and Verilog HDL.	**UNIT-I :** **Digital Logic Families and Interfacing:** Introduction to logic families, CMOS logic, CMOS steady state and dynamic electrical behavior, CMOS logic families. Bipolar logic, transistor-transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic.
	Unit-II: **VHDL Modelling :** Simulation, Logic Synthesis, Inside a logic Synthesizer, Constraints, Technology Libraries, VHDL and Logic Synthesis, Functional Gate-Level verification, Place and Route, Post Layout Timing Simulation, Static Timing, Major Netlist formats for design representation, VHDL Synthesis-Programming Approach	**UNIT-II :** **Introduction to VHDL:** Design flow, program structure, levels of abstraction, Elements of VHDL: Data types, data objects, operators and identifiers. Packages, Libraries and Bindings, Subprograms. VHDL Programming using structural and data flow modeling
	Unit-III: **Programmable Logic Devices (PLDs) & Memories:** Programmable Read Only Memory, Programmable Logic Array, Programmable Array Logic Devices, ROM: Internal structure, 2D-Decoding, Commercial ROM types, timing and applications,. Static RAM: Internal structure, SRAM timing, standard, synchronous SRAMS, Dynamic RAM: Internal structure, timing, synchronous DRAMs. Design considerations of PLDs	**UNIT-III** **Behavioral Modeling:** Process statement, variable assignment statement, signal assignment statement, wait statement , if statement, case statement ,null statement, loop statement, exit statement, next statement ,assertion statement, more on signal assignment statement ,Inertial Delay Model, Transport Delay Model ,Creating Signal Waveforms, Signal Drivers , Other Sequential Statements , Multiple Processes. Logic Synthesis, Inside a logic Synthesizer

	with relevant Digital ICs	
	Unit-IV: **Digital Logic Families and Interfacing:** Introduction to logic families, CMOS logic, CMOS steady state and dynamic electrical behavior, CMOS logic families.bipolar logic, transistor-transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic.	**UNIT-IV :** **Combinational Logic Design:** Binary Adder-Subtractor, Ripple Adder, Look Ahead Carry Generator, ALU, Decoders, encoders, multiplexers and demultiplexers, parity circuits, comparators, Barrel Shifter, Simple FloatingPoint Encoder, Dual Priority Encoder, Design considerations of the above combinational logic circuits with relevant Digital ICs, modeling of above ICs using VHDL.
	Unit-V: **Combinational Logic Design:** Adders & Subtractors, Ripple Adder, Look Ahead Carry Generator, Binary Parallel Adder, Binary Adder-Subtractor, ALU, Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, parity circuits, comparators, multipliers, Barrel Shifter, Simple Floating-Point Encoder, Cascading Comparators, Dual Priority Encoder, Design considerations with relevant Digital ICs, modeling of Circuits by using VHDL.	**UNIT-V :** **Sequential Logic Design:** SSI Latches and flip flops, Ring Counter, Johnson Counter, Design of Modulus N Synchronous Counters, Shift Registers, Universal Shift Registers, Design considerations of the above sequential logic circuits with relevant Digital ICs, modeling of above ICs using VHDL.
	Unit-VI: **Sequential Logic Design:** SSI Latches and Flip-Flops, Counters, Design of Counters using Digital ICs, Ring Counter, Johnson Counter, Modulus N Synchronous Counters, MSI Registers, Shift Registers, Modes of Operation of Shift Registers, Universal Shift Registers, MSI Shift Registers, Design considerations with relevant Digital ICs, modeling of circuits by using VHDL.	**UNIT-VI:** **Synchronous and Asynchronous Sequential Circuits:** Basic design steps: State diagram, state table, state assignment, choice of flip flops and derivation of next state and output expressions, timing diagram. State assignment problem: One hot encoding. Mealy and Moore type FSM for serial adder, VHDL code for the serial adder. Analysis of Asynchronous circuits, State Reduction, State Assignment. A complete design example: The vending machine controller.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Digital System Design & DICA Laboratory**	**DICA LABORATORY**
Course Code	RT31049	R1631048
SYLLABUS	1. Realization of Logic Gates. 2. 3 to 8 Decoder- 74138. 3. 8*1 Multiplexer-74151 and 2*1 De-multiplexer-74155. 4. 4-Bit Comparator-7485. 5. D Flip-Flop- 7474. 6. Decade Counter- 7490. 7. 4 Bit Counter-7493. 8. Shift Register-7495. 9. Universal shift register-74194/195 10. Ram (16*4)-74189 (read and write operations). 11. ALU.	1. Realization of Logic Gates 2. Design of Full Adder using 3 modeling systems 3. 3 to 8 Decoder -74138 4. 8 to 3 Encoder (with and without priority) 5. 8 x 1 Multiplexer-74151 and 2x 4 De-multiplexer-74155 6. 4- Bit comparator-7485 7. D Flip-Flop-7474 8. Decade counter -7490 9. Shift registers-7495 10. 8-bit serial in-parallel out and parallel in-serial out SR 11. First In & First Out (FIFO) 12. MAC (Multiplier & Accumulator) 13. ALU Design.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	VLSI Laboratory	VLSI LABORATORY
Course Code	RT4104L	R1632047
SYLLABUS	1. Design and implementation of an inverter. 2. Design and implementation of universal gates. 3. Design and implementation of full adder. 4. Design and implementation of full subtractor. 5. Design and implementation of RS-latch. 6. Design and implementation of D-latch. 7. Design and implementation asynchronous counte.r 8. Design and Implementation of static RAM cell. 9. Design and Implementation of differential amplifier. 10. Design and Implementation of ring oscillator.	**i.** Design and Implementation of Universal Gates. **ii.** Design and Implementation of an Inverter. **iii.** Design and Implementation of Full Adder. **iv.** Design and Implementation of Full Subtractor. **v.** Design and Implementation of Decoder. **vi.** Design and Implementation of RS-Latch. **vii.** Design and Implementation of D-Latch. **viii.** Design and Implementation asynchronous counter. **ix.** Design and Implementation of static RAM cell. **x.** Design and Implementation of 8 bit DAC using R-2R ladder network

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Date: 25-05-2018

Department of Computer Science and Engineering

Syllabus revision Index 2018-2019

S.No	Name of the course	Percentage of syllabus change
1	Mathematical Foundations of Computer Science	25%
2	Statistics with R Programming	80%
3	Mathematical Foundations of Computer Science	25%
4	Object Oriented Programming Lab	80%
5	Advanced Data Structures Lab	30%
6	Software Engineering	50%
7	Computer Organization	20%
8	Java Programming Lab	50%
9	Database Management Systems Lab	20%
10	Software Testing Methodologies	70%

Program Coordinator

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Department of Humanities & Basic Sciences

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Mathematical Foundations of Computer Science	Mathematical Foundations of Computer Science
Course Code	R1621052	171BS3T08
Syllabus	UNIT -I: Mathematical Logic: Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus, Consistency of Premises, Indirect Method of Proof. Predicate Calculus: Predicative Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus.	Unit - I Mathematical Logic: Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus. Predicate Calculus: Predicate Logic, Statement Functions, Variables and Quantifiers, Free and Bound Variables, Inference Theory for Predicate Calculus.
	UNIT -II: Set Theory: Introduction, Operations on Binary Sets, Principle of Inclusion and Exclusion, Relations: Properties of Binary Relations, Relation Matrix and Digraph, Operations on Relations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering Relations, Hasse Diagrams, Functions: Bijective Functions, Composition of Functions, Inverse Functions, Permutation Functions, Recursive Functions, Lattice and its Properties.	Unit – II Binary Relations and Properties: Binary relations, Properties, Relation Matrix and Digraph, Operations on Relations, Partition and Covering, Transitive Closure, Warshall Algorithm, Equivalence relation, R-Equivalence class, Partial Ordering Relation, Partially ordered sets, Hasse Diagrams.
	UNIT- III: Algebraic Structures and Number Theory: Algebraic Structures: Algebraic Systems, Examples, General Properties, Semi Groups and Monoids, Homomorphism of Semi Groups and Monoids, Group, Subgroup, Abelian Group, Homomorphism, Isomorphism,	Unit – III Algebraic Structures:Algebraic Systems, Examples, General Properties, Semi Groups and Monoids, Group,Abelian Group, permutation groups. Number Theory: Properties of Integers ,Division Algorithm, The Greatest Common Divisor, Euclidean Algorithm, Least

	Number Theory: Properties of Integers, Division Theorem, The Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Modular Arithmetic (Fermat's Theorem and Euler's Theorem)	Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Addition modulo m, Multiplication modulo m, Congruence modulo m, Fermat's Theorem and Euler's Theorem without proof.
	UNIT -IV: Combinatorics: Basic of Counting, Permutations, Permutations with Repetitions, Circular Permutations, Restricted Permutations, Combinations, Restricted Combinations, Generating Functions of Permutations and Combinations, Binomial and Multinomial Coefficients, Binomial and Multinomial Theorems, The Principles of Inclusion–Exclusion, Pigeonhole Principle and its Application	Unit – IV Recurrence Relations: Recurrence Relations, Formation of Recurrence Relations , Solving Recurrence Relations by Substitution and Generating Functions, Method of Characteristic Roots
	UNIT -V: Recurrence Relations: Generating Functions, Function of Sequences, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, Method of Characteristic Roots, Solving Inhomogeneous Recurrence Relations	Unit – V Graph Theory : Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrix, Incidence Matrix, Isomorphic Graphs, Paths and Circuits, Trees-Properties, Spanning trees, Euler and Hamilton Graphs, Planar Graphs and Euler's Formula, Graph Colouring,Chromatic Number, BFS Algorithm, DFS Algorithm, Minimal Spanning Trees and Kruskal's Algorithm.
	UNIT -VI: Graph Theory: Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs, Multigraphs, Planar Graphs, Euler's Formula, Graph Colouring and Covering, Chromatic Number, Spanning Trees, Algorithms for Spanning Trees (Problems Only and Theorems without Proofs).	

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Signature of the HOD

Head of the Department
Department of H & BS
Aditya Engineering College (A9)

Department of Computer Science and Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Statistics with R Programming	Statistics with R Programming
Course Code	R1621051	171CS3T02
Syllabus	**UNIT-I:** Introduction, How to run R, R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes.	**UNIT-I:** **Random Variables and Introduction to R:** Random Variables- Discrete, Continuous variables-Expectation, Variance, Moment Generating Function. Introduction to R software – Vectors – Matrices – Arrays – Lists – Data frames – Basic mathematical operations in R, R functions, loops and Control statements, Basic Graphics.
	UNIT-II: R Programming Structures, Control Statements, Loops, - Looping Over Nonvector Sets,- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Deciding Whether to explicitly call return- Returning Complex Objects, Functions are Objective, No Pointers in R, Recursion, A Quicksort Implementation-Extended Extended Example: A Binary Search Tree.	**UNIT-II:** **Probability Distributions:** Discrete Probability distributions- Binomial distribution, Poisson distribution, Geometric distribution. Continuous Probability distributions- Normal distribution, Gamma distribution, Exponential distribution. Writing R commands for computing above probability distributions.
	UNIT-III: Doing Math and Simulation in R, Math Function, Extended Example Calculating Probability- Cumulative Sums and Products-Minima and Maxima- Calculus,	**UNIT-III:** Sampling Theory: Sampling – Central limit theorem (without proof) – Sampling distribution of means – point estimation – interval estimation. Built in R functions for sample

	Functions Fir Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices, Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains, Set Operation, Input /out put, Accessing the Keyboard and Monitor, Reading and writer Files,	statistics, construction of confidence intervals using R.
	UNIT-IV: Graphics, Creating Graphs, The Workhorse of R Base Graphics, the plot() Function – Customizing Graphs, Saving Graphs to Files.	**UNIT-IV:** **Test of Hypothesis:** Hypothesis, one tailed, two tailed test, types of errors in Sampling, Z-test, t-tests, ANOVA. Writing R programming for above statistical tests.
	UNIT-V: Probability Distributions, Normal Distribution- Binomial Distribution-Poisson Distributions Other Distribution, Basic Statistics, Correlation and Covariance, T-Tests,-ANOVA.	**UNIT-V:** **Correlation and Regression:** Correlation-Simple correlation, rank correlation, properties of correlation coefficient. Regression-Method of least squares-fitting a straight line and quadratic equation, multiple linear Regression. Writing R programs for simple linear correlation and regression.
	UNIT-VI Linear Models, Simple Linear Regression, -Multiple Regression Generalized Linear Models, Logistic Regression, - Poisson Regression- other Generalized Linear Models-Survival Analysis, Nonlinear Models, Splines- Decision-Random Forests,	

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Department of Computer Science and Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Object Oriented Programming Lab	Object Oriented Programming Lab
Course Code	16A91A0501	171CS3L01
Syllabus	**Exercise – 1 (Basics)** Write a Simple Program on printing "Hello World" and "Hello Name" where name is the input from the user a) Convert any two programs that are written in C into C++ b) Write a description of using g++ (150 Words) **Exercise – 2 (Expressions Control Flow)** Write a Program that computes the simple interest and compound interest payable on principal amount (inRs.) of loan borrowed by the customer from a bank for a giver period of time (in years) at specific rate of interest. Further determine whether the bank will benefit by charging simple interest or compound interest. b) Write a Program to calculate the fare for the passengers traveling in a bus. When a Passenger entersthe bus, the conductor asks "What distance will you travel?" On knowing distance frompassenger (as an approximate integer), the conductor mentions the fare to the passenger according to following criteria.	**Week 1 (Expressions Control Flow)** 1.1) Develop a C++ program to find the roots of a quadratic equation. 1.2) Develop a C++ program to find factorial of a given number using recursion. **Week 2 (Variables, Scope)** 2.1) Develop a C++ program to implement call-by-reference. 2.2) Develop a C++ program to illustrate scope resolution and namespaces. 2.3) Develop a C++ program illustrating Inline Functions. **Week 3 ((Classes and Objects)** 3.1) Develop a C++ program demonstrating a Bank Account with necessary data members and member functions. 3.2) Develop a C++ program for illustrating Access Specifiers public and private. 3.3) Develop a C++ program to illustrate this pointer. **Week 4 (Functions)** 4.1) Develop a C++ program illustrate function overloading. 4.2) Develop a C++ program to illustrate the use of default arguments. 4.3) Develop a C++ program illustrating friend function. **Week 5 (Constructors and**

	Exercise – 3 (Variables, Scope, Allocation) a) Write a program to implement call by value and call by reference using reference variable. b) Write a program to illustrate scope resolution, new and delete Operators. (Dyanamic Memory Allocation) c) Write a program to illustrate Storage classes d) Write a program to illustrate Enumerations **Exercises –4** (Functions) Write a program illustrating Inline Functions a) Write a program illustrate function overloading. Write 2 overloading functions for power. b) Write a program illustrate the use of default arguments for simple interest function. **Exercise -5** (Functions –Exercise Continued) a) Write a program to illustrate function overloading. Write 2 overloading functions for adding two numbers b) Write a program illustrate function template for power of a number. c) Write a program to illustrate function template for swapping of two numbers. **Exercise -6** (Classes Objects) Create a Distance class with: • feet and inches as data members • member function to input distance • member function to output distance • member function to add two distance objects a). Write a main function to create objects of DISTANCE class. Input two distances and output the sum. b). Write a C++ Program to illustrate the use of Constructors and Destructors (use the	**Destructors)** 5.1) Develop a C++ Program to illustrate the use of Constructors and Destructors. 5.2) Develop a C++ program illustrating Constructor overloading. 5.3) Develop a C++ program illustrating Copy Constructor. **Week 6 (Operator Overloading)** 6.1) Develop a C++ program to Overload Unary, and Binary Operators using member function. 6.2) Develop a C++ program to Overload Unary, and Binary Operators using friend function. 6.3) Develop a case study on Overloading Operators and Overloading Functions. (150 Words) **Week 7(Inheritance)** 7.1) Develop C++ Programs to incorporate various forms of Inheritance 7.2) Develop a C++ program in C++ to illustrate the order of execution of constructors and destructors in inheritance. **Week 8 (Access)** 8.1) Develop a C++ program to illustrate object as a class member. 8.2) Develop a C++ program to illustrate pointer to a class. 8.3) Develop a C++ program to illustrate Virtual Base Class. **Week 9 (Polymorphism)** 10.1) Develop a C++ program to illustrate virtual functions. 10.2) Develop a C++ program to illustrate runtime polymorphism. 10.3) Develop a C++ program to illustrate pure virtual function and calculate the area of different shapes by using abstract class. **Week 10(Templates)** 10.1) Develop a C++ Program illustrating function template. 10.1) Develop a C++ Program illustrating template class.

	above program.) c) Write a program for illustrating function overloading in adding the distance between objects (use the above problem) d). Write a C++ program demonstrating a BankAccount with necessary methods and variables **Exercise – 7** (Access) Write a program for illustratingAccess Specifiers public, private, protected a) Write a program implementing Friend Function b) Write a program to illustrate this pointer c) Write a Program to illustrate pointer to a class **Exercise -8** (Operator Overloading) a). Write a program to Overload Unary, and Binary Operators as Member Function, and Non Member Function. i. Unary operator as member function ii. Binary operator as nonmember function b). Write a c ++ program to implement the overloading assignment = operator c).Write a case study on Overloading Operators and Overloading Functions (150 Words) **Exercise -9** (Inheritance) a) Write C++ Programs and incorporating various forms of Inheritance i) Single Inheritance ii) Hierarchical Inheritance iii) Multiple Inheritances iv) Multi-level inheritance v) Hybrid inheritance b) Write a program to show Virtual Base Class c) Write a case study on using virtual classes (150 Words) **Exercise-10** (Inheritance –Continued) a) Write a Program in C++ to illustrate the order of execution of constructors	10.2) Develop a C++ program to illustrate class templates with multiple parameters. **Week 11(Exception Handling)** 11.1) Develop a C++ program for handling Exceptions. 11.2) Develop a C++ program to illustrate the use of multiple catch statements. **Week 12 (STL)** 12.1) Develop a C++ program to implement List, Vector and its Operations. 12.2) Develop a C++ program to implement Deque and Deque Operations. 12.3) Develop a C++ program to implement Map and Map Operations.

	and destructors in inheritance b) Write a Program to *show* how *constructors* are invoked in *derived class* **Exercise -11** (Polymorphism) a) Write a program to illustrate runtime polymorphism b) Write a program to illustrate this pointer c) Write a program illustrates pure virtual function and calculate the area of different shapes by using abstract class. d) Write a case study on virtual functions (150 Words) **Exercise -12**(Templates) a) Write a C++ Program to illustrate template class b) Write a Program to illustrate class templates with multiple parameters c) Write a Program to illustrate member function templates **Exercise -13** (Exception Handling) a).Write a Program for Exception Handling Divide by zero b). Write a Program to rethrow an Exception **Exercise -14** (STL) a) Write a Program to implement List and List Operations b) Write a Program to implementVector andVector Operations **Exercise -15** (STLContinued) a) Write a Program to implement Deque and Deque Operations b) Write a Program to implement Map and Map Operations	

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ADITYA ENGINEERING COLLEGE

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Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

Aditya Nagar, ADB Road, Surampalem - 533437, Near Kakinada, E.G.Dt., Ph:99498 76662

Department of Computer Science and Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Advanced Data Structures Lab	Advanced Data Structures Lab
Course Code	R1622057	171CS3L02
Syllabus	1. To perform various operations i.e., insertions and deletions on AVL trees. 2. To implement operations on binary heap. i) Vertex insertion ii) Vertex deletion iii) Finding vertex iv) Edge addition and deletion 3. To implement Prim's algorithm to generate a min-cost spanning tree. 4. To implement Krushkal's algorithm to generate a min-cost spanning tree. 5. To implement Dijkstra's algorithm to find shortest path in the graph. 6. To implementation of Static Hashing (Use Linear probing for collision resolution) 7. To implement of Huffmann coding. 8. To implement of B-tree.	1) Develop a recursive program to implement Breadth First Search and Depth First Search. 2) Develop a non recursive program to implement Breadth First Search and Depth First Search. 3) Develop a program to generate a minimum-cost spanning tree using Prim's algorithm. 4) Develop a program to generate a minimum-cost spanning tree using Kruskal's algorithm. 5) Develop a program to implement Huffman coding. 6) Develop a program to implement functions of dictionary using Hashing Techniques (division method, digit folding and mid square method). 7) Develop a program to implement Collision Resolution in Hash Table. 8) Develop a program to perform binary heap operations. 9) Develop a program to perform AVL tree operations. 10) Develop a program to perform Red-Black tree operations. 11) Develop a program to implement B-Tree operations. 12) Develop a program to implement B+ Tree operations.

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Department of Computer Science and Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Software Engineering	Software Engineering
Course Code	R1622051	171CS4T05
Syllabus	**UNIT-I:** Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths. Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.	**UNIT-I:** **Introduction to Software Engineering**: Software, Software Crisis, Software Engineering Definition, Evolution of Software Engineering Methodologies, Software Engineering Challenges. i) Advantages and Disadvantages of the models ii) Applicability of the model iii) Projects developed using the various models **Software Process:** Software Process, Process Classification, Phased Development Life Cycle, Software Development Process Models. **Case Study**: Survey on different process models including
	UNIT-II: **Requirements Analysis And Specification:** Requirements Gathering and Analysis, Software Requirement Specification (SRS), Formal System Specification. **Software Design:** Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design	**UNIT-II:** **Software Project Management:** Project Management Essentials, What is Project Management, Software Configuration Management, Risk management. **Project Planning and Estimation:** Project Planning Activities, Software Metrics and Measurements, Project Size Estimation, Effort Estimation Techniques. **Case Study:** Estimate the effort using function point analysis for a real time

		project
	UNIT-III: **Function-Oriented Software Design:** Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, over view of Object Oriented design. **User Interface Design:** Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.	**UNIT-III:** **Requirements Engineering:** Software Requirements, Requirements Engineering Process, Requirements Elicitation and Analysis, Requirements Specification, Requirements Validation, Requirements Management, **Case Study:** Create a SRS document for a real time scenario.
	UNIT-IV: **Coding And Testing:** Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing	**UNIT-IV:** **Software Design:** Software Design Process, Characteristics of Good Software Design, Design Principles, Modular Design, Software Architecture, Design Methodologies, **Implementation:** Coding Principles, Coding Process, Code Verification, Code Documentation. **Case Study:** Construct the HLD and LLD using SRS created.
	UNIT-V: **Software Reliability And Quality Management:** Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model. **Computer Aided Software Engineering:** Case and its Scope, Case Environment, Case Support in Software Life Cycle, Other Characteristics of Case Tools, Towards Second Generation CASE Tool, Architecture of a Case Environment .	**UNIT-V:** . **Software Testing:** Testing Fundamentals, Test Planning, Black-Box Testing, White-Box Testing, Levels of Testing, Usability Testing, Regression Testing, Debugging Approaches. **Software Quality and Reliability:** Software Quality factors, Verification & Validation, Software Quality Assurance, The Capability Maturity Model, Software Reliability. **Case Study:** Write the test cases for the real time scenario considered.

	UNIT-VI **Software Maintenance:** Software maintenance, Maintenance Process Models, Maintenance Cost, Software Configuration Management. **Software Reuse**: what can be reused? Why almost No Reuse So Far? Basic Issues in Reuse Approach, Reuse at Organization Level.	

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Department of Computer Science and Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Computer Organization	Computer Organization
Course Code	R1622054	171CS4T10
Syllabus	**UNIT-I:** Basic Structure Of Computers: Functional unit, Basic Operational concepts, Bus structures, System Software, Performance, The history of computer development.	**UNIT-I:** **Basic Structure of Computers:** Computer Types, Functional Units, Basic Operational Concepts, Bus structures, Software, Performance, Historical Perspective. **Machine Instruction and Programs:** Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Stacks and Queues, Additional Instructions. **Case Study:** ARM, Motorola and Intel Instruction sets.
	UNIT-II: **Machine Instruction and Programs:** Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types, Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation. Component of Instructions: Logic Instructions, shift and Rotate Instructions	**UNIT-II:** **Arithmetic :** Addition and Subtraction of Signed Numbers, Signed-Operand Multiplication, Floating-Point Numbers and Operations – IEEE Standard for Floating-Point Numbers, Arithmetic Operations on Floating-Point Numbers. **Basic Processing Unit:** Some Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Micro **programd** Control - Microinstructions, Micro program Sequencing, Wide Branch Addressing, Microinstructions with Next –Address Field.
	UNIT-III: Type of Instructions: Arithmetic and Logic Instructions, Branch Instructions, Addressing Modes, Input/output Operations	**UNIT-III:** **The Memory System:** Some Basic Concepts, Read-Only Memories - ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size and Cost, Cache

		Memories - Mapping Functions, Replacement Algorithms, Performance considerations – Interleaving, Hit Rate and Miss Penalty, Virtual Memories, Memory Management Requirements, Secondary Storage.
	UNIT-IV: **INPUT/OUTPUTORGANIZATION:** Accessing I/O Devices, Interrupts: Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses: Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB)	**UNIT-IV:** **Input/Output Organization:** Accessing I/O Devices, Interrupts - Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, modes of transfer –**Programd** I/O, Interrupt initiated I/O & Direct Memory Access, Buses - Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interfaces - Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB).
	UNIT-V: **The MEMORY SYSTEMS:** Basic memory circuits, Memory System Consideration, Read- Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory, Cache Memories: MappingFunctions, INTERLEAVING **Secondary Storage:** Magnetic Hard Disks, Optical Disks,	**UNIT-V:** **Pipelining :** Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets, Datapath and Control Considerations, Superscalar Operation.
	UNIT-VI Processing Unit: Fundamental Concepts: Register Transfers, Performing An Arithmetic Or Logic Operation, Fetching A Word From Memory, Execution of Complete Instruction, Hardwired Control, Micro programmed Control: Microinstructions, Micro program Sequencing, Wide Branch Addressing Microinstructions with next –Address Field	

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Department of Computer Science and Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Java Programming Lab	Java Programming Lab
Course Code	R1622058	171CS4L03
Syllabus	Exercise - 1 (Basics) a). Write a JAVA program to display default value of all primitive data type of JAVA b). Write a java program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root. c). Five Bikers Compete in a race such that they drive at a constant speed which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all 5 racers. Take as input the speed of each racer and print back the speed of qualifying racers. d) Write a case study on public static void main(250 words) Exercise - 2 (Operations, Expressions, Control-flow, Strings) a). Write a JAVA program to search for an element in a given list of elements using binary search mechanism. b). Write a JAVA program to sort for an element in a given list of elements using bubble sort (c). Write a JAVA program to sort for an element in a given list of elements using merge sort. (d) Write a JAVA program using StringBufferto delete, remove	1.1) Write a Java program to find the discriminent value D and find out the roots of **Week 1 (Basic Programs)** the quadratic equation of the form ax2+bx+c=0. 1.2) Five Bikers Compete in a race such that they drive at a constant speed which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all 5 racers. Take as input the speed of each racer and print back the speed of qualifying racers. **Week 2** (Control Flow Statements) 2.1) Write a Java program to select all the prime numbers within the range of 1 to 10000. 2.2) Write a Java program to Find the sum of all even terms in the Fibonacci sequence up to the given range N. 2.3) Write a Java program to check whether a given N digit number is Armstrong or not. **Week 3** (Class Mechanism) 3.1) Write a Java program to display the details of a person. Personal details should be given in one method and the qualification details in another method. 3.2) Write a Java program to implement constructor. 3.3) Write a Java program to implement

	character. Exercise - 3 (Class, Objects) a). Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method. b). Write a JAVA program to implement constructor. Exercise - 4 (Methods) a). Write a JAVA program to implement constructor overloading. b). Write a JAVA program implement method overloading. Exercise - 5 (Inheritance) a). Write a JAVA program to implement Single Inheritance b). Write a JAVA program to implement multi level Inheritance c). Write a java program for abstract class to find areas of different shapes Exercise - 6 (Inheritance - Continued) a). Write a JAVA program give example for "super" keyword. b). Write a JAVA program to implement Interface. What kind of Inheritance can be achieved? **Exercise - 7** (Exception) a).Write a JAVA program that describes exception handling mechanism b).Write a JAVA program Illustrating Multiple catch clauses **Exercise – 8** (Runtime Polymorphism) a). Write a JAVA program that implements Runtime polymorphism b). Write a Case study on run time polymorphism, inheritance that implements in above problem **Exercise – 9** (User defined Exception) a). Write a JAVA program for creation of Illustrating throw b). Write a JAVA program for creation of Illustrating finally c). Write a JAVA program for creation of Java Built-in Exceptions	method overloading. **Week 4** (Arrays) 4.1) Write a Java program to perform addition and multiplication of two matrices. 4.2) Write a Java program to implement binary search. 4.3) Write a Java program to sort the elements using Quick sort. **Week 5** (Strings) 5.1) Write a Java program to sort given set of strings. 5.2) Write a Java program for using StringBuffer to remove or delete a character. 5.3) Write a Java program to find the number of tokens in a given string without using countTokens() method but by using other methods of StringTokenizer class. **Week 6** (Inheritance, Interface & Abstract Class) 6.1) Write a Java program to find the available balance in a customer account. Customer's account details should be taken as input in one class, Transaction details should be taken in another class. (Note: Make use of Multi-Level Inheritance.) 6.2) Take the details of internal exam marks in one Interface. Take the details of external exam marks in another interface. Write a Java program to find the total marks obtained in each subject by a student. (Note: Make use of Multiple Inheritance using interfaces.) 6.3) Write a Java program to find the areas of different shapes using abstract classes. **Week 7** (Packages) 7.1) Write a Java program to illustrate the use of classpath using Java code. 7.2) Write a Java program that import

	d).Write a JAVA program for creation of User Defined Exception **Exercise – 10** (Threads) a). Write a JAVA program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds ,(Repeat the same by implementing Runnable) b). Write a program illustrating **isAlive** and **join ()** c). Write a Program illustrating Daemon Threads. **Exercise - 11** (Threads continuity) a).Write a JAVA program Producer Consumer Problem b).Write a case study on thread Synchronization after solving the above producer consumer problem **Exercise – 12** (Packages) a). Write a JAVA program illustrate class path b). Write a case study on including in class path in your os environment of your package. c). Write a JAVA program that import and use the defined your package in the previous Problem **Exercise - 13** (Applet) a).Write a JAVA program to paint like paint brush in applet. b) Write a JAVA program to display analog clock using Applet. c). Write a JAVA program to create different shapes and fill colors using Applet. **Exercise - 14** (Event Handling) a).Write a JAVA program that display the x and y position of the cursor movement using Mouse. b).Write a JAVA program that identifies key-up key-down event user entering text in a	and use user defined package. 7.3) Write a Java program to illustrate the use of protected members in a package. **Week 8 (Exception Handling)** 8.1) Write a Java program to illustrate exception handling mechanism using multiple catch clauses. 8.2) Write a Java program to make use of Built-in and user-defined Exceptions in handling a run time exception. **Week 9** (Multithreading) 9.1) Write a Java program to demonstrate the use of demon thread. 9.2) Write a Java program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds, (Repeat the same by implementing Runnable). 9.3) Write a Java program to solve Producer-Consumer problem using synchronization. **Week 10** (Applets) 10.1) Write a Java program to demonstrate the Life Cycle of an applet. 10.2) Write a Java program to draw different shapes and fill each shape with a colour using applets. **Week 11** (Event Handling) 11.1)Write a Java program to illustrate the Keyboard Events by using an applet code. 11.2) Write a Java program to illustrate the Mouse Events by using an applet code. **Week 12 (AWT & Swings)** 12.1) Write a Java program to generate a simple calculator using AWT components. 12.2) Write a Java program to create a single ball bouncing inside a JPanel.

	Applet. **Exercise - 15** (Swings) a).Write a JAVA programto build a Calculator in Swings b). Write a JAVA program to display the digital watch in swing tutorial. **Exercise – 16 (Swings - Continued)** a). Write a JAVA program that to create a single ball bouncing inside a JPanel. b). Write a JAVA program JTree as displaying a real tree upside down	**List of Augmented Experiments:** (Any 2 of the following experiments can be performed) 13) Create an interface which consists of methods with the name's no of watt's consumable, luminescent value, efficiency in percentage. Write classes for different categories of bulbs like LED, tube light and find out which light is efficient in terms of consumption. 14) Write a Java program to display analog clock using Applet. 15) Write a Java program to create a menu of a restaurant which includes starters, veggies, delights etc. Ask the user to select the items from the menu and generate bill for those items which he has chosen. (Make use of Swing Components). 16) Write a Java program to display all drives in our system as a tree structure using JTree.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Database Management System Lab	Database Management System Lab
Course Code	R1631058	171CS4L04
Syllabus	SQL 1. Queries to facilitate acquaintance of Built-In Functions, String Functions, Numeric Functions, Date Functions and Conversion Functions. 2. Queries using operators in SQL 3. Queries to Retrieve and Change Data: Select, Insert, Delete, and Update 4. Queries using Group By, Order By, and Having Clauses 5. Queries on Controlling Data: Commit, Rollback, and Save point 6. Queries to Build Report in SQL *PLUS 7. Queries for Creating, Dropping, and Altering Tables, Views, and Constraints 8. Queries on Joins and Correlated Sub-Queries 9. Queries on Working with Index, Sequence, Synonym, Controlling Access, and Locking Rows for Update, Creating Password and Security features PL/SQL 10. Write a PL/SQL Code using Basic Variable, Anchored Declarations, and Usage of Assignment Operation 11. Write a PL/SQL Code Bind and Substitution Variables. Printing in PL/SQL	Week 1 1) Queries for Creating, Altering and Dropping Tables, Views and Constraints. Week 2 2) Queries to Retrieve and Change Data: Select, Insert, Delete and Update. 4.1) Queries using Group By, Order By, and Having Clauses. 4.2) Queries on Controlling Data: Commit, Rollback, and Save point. Week 3 3.1) Queries to facilitate acquaintance of Built-in Functions: String Functions, Numeric Functions, Date Functions and Conversion Functions. 3.2) Queries using operators in SQL. Week 4 Week 5 5) Queries on Joins and Correlated Sub-queries. Week 6 6) Queries on Working with Index, Sequence, Synonyms. Week 7 7) Queries to Build Views. PL/SQL Week 8 8) Write a PL/SQL Code using Basic Variables and Usage of Assignment Operation. Week 9 9) Write a PL/SQL Code to Bind and Substitute variables in PL/SQL.

	12. Write a PL/SQL block using SQL and Control Structures in PL/SQL 13. Write a PL/SQL Code using Cursors, Exceptions and Composite Data Types 14. Write a PL/SQL Code using Procedures, Functions, and Packages FORMS 15. Write a PL/SQL Code Creation of forms for any Information System such as Student Information System, Employee Information System etc. 18 16. Demonstration of database connectivity	Week 10 10) Write a PL/SQL block using SQL and Control Structures. Week 11 11) Write a PL/SQL Code using Cursors, Exceptions and Composite Data Types. Week 12 12) Write a PL/SQL Code using Procedures, Functions, Packages. List of Augmented Experiments: (Any 2 of the following experiments can be performed) 13) For a Sales Order Database System, based on the given E-R diagram

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Software Testing Methodologies	Software Testing Methodologies
Course Code	RT41054	R1632054
Syllabus	**UNIT-I:** **Software Testing:** Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing **Software Testing Terminology and Methodology:** Software Testing Terminology, Software Testing Life Cycle, relating test life cycle to developmentlife cycle Software Testing Methodology.	**UNIT-I:** **Introduction:** Purpose of Testing, Dichotomies, Model for Testing, Consequences of Bugs,Taxonomy of Bugs. **Flow graphs and Path testing:** Basics Concepts of Path Testing, Predicates, Path Predicates andAchievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.
	UNIT-II: **Verification and Validation:** Verification & Validation Activities, Verification, Verification of Requirements, High level and low level designs, How to verify code, Validation **Dynamic Testing I: Black Box testing techniques:** Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing	**UNIT-II:** **Transaction Flow Testing:** Transaction Flows, Transaction Flow Testing Techniques. **Dataflow testing:** Basics of Dataflow Testing, Strategies in Dataflow Testing, Application Of Dataflow Testing.
	UNIT-III: Dynamic Testing II: White-Box	**UNIT-III:** Domain Testing: Domains and Paths,

	Testing: need, Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing, mutation testing Static Testing: inspections, Structured Walkthroughs, Technical reviews	Nice & Ugly Domains, Domain testing, Domains And Interfaces Testing, Domain and Interface Testing, Domains and Testability. Paths, Path products and Regular expressions: Path Products & Path Expression, Reduction Procedure, Applications, Regular Expressions & Flow Anomaly Detection.
	UNIT-IV: **Validation activities:** Unit testing, Integration Testing,. Function testing, system testing, acceptance testing **Regression testing:** Progressives Vs regressive testing, Regression testability, Objectives of regression testing, When regression testing done?, Regression testing types, Regression testing techniques	**UNIT-IV:** **Syntax Testing:** Why, What and How, A Grammar for formats, Test Case Generation, Implementation and Application and Testability Tips. **Logic Based Testing:** Overview, Decision Tables, Path Expressions, KV Charts, and Specifications.
	UNIT-V: . **Efficient Test Suite Management:** Test case deisgnWhy does a test suite grow, Minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite **Software Quality Management:** Software Quality metrics, SQA models Debugging: process, techniques, correcting bugs, Basics of testing management tools, test link and Jira	**UNIT-V:** . **State, State Graphs and Transition Testing:** State Graphs, Good & Bad State Graphs, State Testing, and Testability Tips. **Graph Matrices and Application:-** Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm.
	UNIT-VI **Automation and Testing Tools:** need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for	**UNIT-VI** **Software Testing Tools**: Introduction to Testing, Automated Testing, Concepts of Test Automation, Introduction to list of tools

	automated testing, overview of some commercial testing tools. **Testing Object Oriented Software:** basics, Object oriented testing **Testing Web based Systems:** Challenges in testing for web based software, quality aspects, web engineering, testing of web based systems, Testing mobile systems	like Win runner, Load Runner, Jmeter, About Win Runner ,Using Win runner, Mapping the GUI, Recording Test, Working with Test, Enhancing Test, Checkpoints, Test Script Language, Putting it all together, Running and Debugging Tests, Analyzing Results, Batch Tests, Rapid Test Script Wizard.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Statistics with R Programming	Statistics with R Programming
Course Code	R1621051	171CS3T02
Syllabus	**UNIT-I:** Introduction, How to run R, R Sessions and Functions, Basic Math, Variables, Data Types, Vectors, Conclusion, Advanced Data Structures, Data Frames, Lists, Matrices, Arrays, Classes.	**UNIT-I:** **Random Variables and Introduction to R:** Random Variables- Discrete, Continuous variables-Expectation, Variance, Moment Generating Function. Introduction to R software – Vectors – Matrices – Arrays – Lists – Data frames – Basic mathematical operations in R, R functions, loops and Control statements, Basic Graphics.
	UNIT-II: R Programming Structures, Control Statements, Loops, - Looping Over Nonvector Sets,- If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, Deciding Whether to explicitly call return- Returning Complex Objects, Functions are Objective, No Pointers in R, Recursion, A Quicksort Implementation-Extended Extended Example: A Binary Search Tree.	**UNIT-II:** **Probability Distributions:** Discrete Probability distributions- Binomial distribution, Poisson distribution, Geometric distribution. Continuous Probability distributions- Normal distribution, Gamma distribution, Exponential distribution. Writing R commands for computing above probability distributions.
	UNIT-III: Doing Math and Simulation in R, Math Function, Extended Example Calculating Probability- Cumulative Sums and Products-Minima and Maxima- Calculus,	**UNIT-III:** Sampling Theory: Sampling – Central limit theorem (without proof) – Sampling distribution of means – point estimation – interval estimation. Built in R functions for sample

	Functions Fir Statistical Distribution, Sorting, Linear Algebra Operation on Vectors and Matrices, Extended Example: Vector cross Product- Extended Example: Finding Stationary Distribution of Markov Chains, Set Operation, Input /out put, Accessing the Keyboard and Monitor, Reading and writer Files,	statistics, construction of confidence intervals using R.
	UNIT-IV: Graphics, Creating Graphs, The Workhorse of R Base Graphics, the plot() Function – Customizing Graphs, Saving Graphs to Files.	**UNIT-IV:** **Test of Hypothesis:** Hypothesis, one tailed, two tailed test, types of errors in Sampling, Z-test, t-tests, ANOVA. Writing R programming for above statistical tests.
	UNIT-V: Probability Distributions, Normal Distribution- Binomial Distribution- Poisson Distributions Other Distribution, Basic Statistics, Correlation and Covariance, T-Tests,- ANOVA.	**UNIT-V:** **Correlation and Regression:** Correlation-Simple correlation, rank correlation, properties of correlation coefficient. Regression-Method of least squares-fitting a straight line and quadratic equation, multiple linear Regression. Writing R programs for simple linear correlation and regression.
	UNIT-VI Linear Models, Simple Linear Regression, -Multiple Regression Generalized Linear Models, Logistic Regression, - Poisson Regression- other Generalized Linear Models-Survival Analysis, Nonlinear Models, Splines- Decision-Random Forests,	

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Department of Information Technology

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Object Oriented Programming Lab	Object Oriented Programming Lab
Course Code	16A91A0501	171CS3L01
Syllabus	**Exercise – 1 (Basics)** Write a Simple Program on printing "Hello World" and "Hello Name" where name is the input from the user a) Convert any two programs that are written in C into C++ b) Write a description of using g++ (150 Words) **Exercise – 2 (Expressions Control Flow)** Write a Program that computes the simple interest and compound interest payable on principal amount (inRs.) of loan borrowed by the customer from a bank for a giver period of time (in years) at specific rate of interest. Further determine whether the bank will benefit by charging simple interest or compound interest. b) Write a Program to calculate the fare for the passengers traveling in a bus. When a Passenger entersthe bus, the conductor asks "What distance will you travel?" On knowing distance frompassenger (as an approximate integer), the conductor mentions the fare to the passenger according to following criteria.	**Week 1 (Expressions Control Flow)** 1.1) Develop a C++ program to find the roots of a quadratic equation. 1.2) Develop a C++ program to find factorial of a given number using recursion. **Week 2 (Variables, Scope)** 2.1) Develop a C++ program to implement call-by-reference. 2.2) Develop a C++ program to illustrate scope resolution and namespaces. 2.3) Develop a C++ program illustrating Inline Functions. **Week 3 ((Classes and Objects)** 3.1) Develop a C++ program demonstrating a Bank Account with necessary data members and member functions. 3.2) Develop a C++ program for illustrating Access Specifiers public and private. 3.3) Develop a C++ program to illustrate this pointer. **Week 4 (Functions)** 4.1) Develop a C++ program illustrate function overloading. 4.2) Develop a C++ program to illustrate the use of default arguments. 4.3) Develop a C++ program illustrating friend function. **Week 5 (Constructors and**

	Exercise – 3 (Variables, Scope, Allocation) a) Write a program to implement call by value and call by reference using reference variable. b) Write a program to illustrate scope resolution, new and delete Operators. (Dyanamic Memory Allocation) c) Write a program to illustrate Storage classes d) Write a program to illustrate Enumerations **Exercises –4** (Functions) Write a program illustrating Inline Functions a) Write a program illustrate function overloading. Write 2 overloading functions for power. b) Write a program illustrate the use of default arguments for simple interest function. **Exercise -5** (Functions –Exercise Continued) a) Write a program to illustrate function overloading. Write 2 overloading functions for adding two numbers b) Write a program illustrate function template for power of a number. c) Write a program to illustrate function template for swapping of two numbers. **Exercise -6** (Classes Objects) Create a Distance class with: • feet and inches as data members • member function to input distance • member function to output distance • member function to add two distance objects a). Write a main function to create objects of DISTANCE class. Input two distances and output the sum. b). Write a C++ Program to illustrate the use of Constructors and Destructors (use the	**Destructors)** 5.1) Develop a C++ Program to illustrate the use of Constructors and Destructors. 5.2) Develop a C++ program illustrating Constructor overloading. 5.3) Develop a C++ program illustrating Copy Constructor. **Week 6 (Operator Overloading)** 6.1) Develop a C++ program to Overload Unary, and Binary Operators using member function. 6.2) Develop a C++ program to Overload Unary, and Binary Operators using friend function. 6.3) Develop a case study on Overloading Operators and Overloading Functions. (150 Words) **Week 7(Inheritance)** 7.1) Develop C++ Programs to incorporate various forms of Inheritance 7.2) Develop a C++ program in C++ to illustrate the order of execution of constructors and destructors in inheritance. **Week 8 (Access)** 8.1) Develop a C++ program to illustrate object as a class member. 8.2) Develop a C++ program to illustrate pointer to a class. 8.3) Develop a C++ program to illustrate Virtual Base Class. **Week 9 (Polymorphism)** 10.1) Develop a C++ program to illustrate virtual functions. 10.2) Develop a C++ program to illustrate runtime polymorphism. 10.3) Develop a C++ program to illustrate pure virtual function and calculate the area of different shapes by using abstract class. **Week 10(Templates)** 10.1) Develop a C++ Program illustrating function template. 10.1) Develop a C++ Program illustrating template class.

	above program.) c) Write a program for illustrating function overloading in adding the distance between objects (use the above problem) d). Write a C++ program demonstrating a BankAccount with necessary methods and variables **Exercise – 7** (Access) Write a program for illustratingAccess Specifiers public, private, protected a) Write a program implementing Friend Function b) Write a program to illustrate this pointer c) Write a Program to illustrate pointer to a class **Exercise -8** (Operator Overloading) a). Write a program to Overload Unary, and Binary Operators as Member Function, and Non Member Function. i. Unary operator as member function ii. Binary operator as nonmember function b). Write a c ++ program to implement the overloading assignment = operator c).Write a case study on Overloading Operators and Overloading Functions (150 Words) **Exercise -9** (Inheritance) a) Write C++ Programs and incorporating various forms of Inheritance i) Single Inheritance ii) Hierarchical Inheritance iii) Multiple Inheritances iv) Multi-level inheritance v) Hybrid inheritance b) Write a program to show Virtual Base Class c) Write a case study on using virtual classes (150 Words) **Exercise-10** (Inheritance –Continued) a) Write a Program in C++ to illustrate the order of execution of constructors	10.2) Develop a C++ program to illustrate class templates with multiple parameters. **Week 11(Exception Handling)** 11.1) Develop a C++ program for handling Exceptions. 11.2) Develop a C++ program to illustrate the use of multiple catch statements. **Week 12 (STL)** 12.1) Develop a C++ program to implement List, Vector and its Operations. 12.2) Develop a C++ program to implement Deque and Deque Operations. 12.3) Develop a C++ program to implement Map and Map Operations.

	and destructors in inheritance b) Write a Program to *show* how *constructors* are invoked in *derived class* **Exercise -11** (Polymorphism) a) Write a program to illustrate runtime polymorphism b) Write a program to illustrate this pointer c) Write a program illustrates pure virtual function and calculate the area of different shapes by using abstract class. d) Write a case study on virtual functions (150 Words) **Exercise -12**(Templates) a) Write a C++ Program to illustrate template class b) Write a Program to illustrate class templates with multiple parameters c) Write a Program to illustrate member function templates **Exercise -13** (Exception Handling) a).Write a Program for Exception Handling Divide by zero b). Write a Program to rethrow an Exception **Exercise -14** (STL) a) Write a Program to implement List and List Operations b) Write a Program to implementVector andVector Operations **Exercise -15** (STLContinued) a) Write a Program to implement Deque and Deque Operations b) Write a Program to implement Map and Map Operations	

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Department of Information Technology

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Advanced Data Structures Lab	Advanced Data Structures Lab
Course Code	R1622057	171CS3L02
Syllabus	1. To perform various operations i.e., insertions and deletions on AVL trees. 2. To implement operations on binary heap. i) Vertex insertion ii) Vertex deletion iii) Finding vertex iv) Edge addition and deletion 3. To implement Prim's algorithm to generate a min-cost spanning tree. 4. To implement Krushkal's algorithm to generate a min-cost spanning tree. 5. To implement Dijkstra's algorithm to find shortest path in the graph. 6. To implementation of Static Hashing (Use Linear probing for collision resolution) 7. To implement of Huffmann coding. 8. To implement of B-tree.	1) Develop a recursive program to implement Breadth First Search and Depth First Search. 2) Develop a non recursive program to implement Breadth First Search and Depth First Search. 3) Develop a program to generate a minimum-cost spanning tree using Prim's algorithm. 4) Develop a program to generate a minimum-cost spanning tree using Kruskal's algorithm. 5) Develop a program to implement Huffman coding. 6) Develop a program to implement functions of dictionary using Hashing Techniques (division method, digit folding and mid square method). 7) Develop a program to implement Collision Resolution in Hash Table. 8) Develop a program to perform binary heap operations. 9) Develop a program to perform AVL tree operations. 10) Develop a program to perform Red-Black tree operations. 11) Develop a program to implement B-Tree operations. 12) Develop a program to implement B+ Tree operations.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Software Engineering	Software Engineering
Course Code	R1622051	171CS4T05
Syllabus	**UNIT-I:** Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths. Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.	**UNIT-I:** **Introduction to Software Engineering**: Software, Software Crisis, Software Engineering Definition, Evolution of Software Engineering Methodologies, Software Engineering Challenges. i) Advantages and Disadvantages of the models ii) Applicability of the model iii) Projects developed using the various models **Software Process:** Software Process, Process Classification, Phased Development Life Cycle, Software Development Process Models. **Case Study**: Survey on different process models including
	UNIT-II: **Requirements Analysis And Specification:** Requirements Gathering and Analysis, Software Requirement Specification (SRS), Formal System Specification. **Software Design:** Overview of the Design Process, How to Characterise of a Design?, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design	**UNIT-II:** **Software Project Management:** Project Management Essentials, What is Project Management, Software Configuration Management, Risk management. **Project Planning and Estimation:** Project Planning Activities, Software Metrics and Measurements, Project Size Estimation, Effort Estimation Techniques. **Case Study: E**stimate the effort using function point analysis for a real time

		project
	UNIT-III: **Function-Oriented Software Design:** Overview of SA/SD Methodology, Structured Analysis, Developing the DFD Model of a System, Structured Design, Detailed Design, Design Review, over view of Object Oriented design. **User Interface Design**: Characteristics of Good User Interface, Basic Concepts, Types of User Interfaces, Fundamentals of Component-based GUI Development, A User Interface Design Methodology.	**UNIT-III:** **Requirements Engineering:** Software Requirements, Requirements Engineering Process, Requirements Elicitation and Analysis, Requirements Specification, Requirements Validation, Requirements Management, **Case Study:** Create a SRS document for a real time scenario.
	UNIT-IV: **Coding And Testing:** Coding, Code Review, Software Documentation, Testing, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tool, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing	**UNIT-IV:** **Software Design:** Software Design Process, Characteristics of Good Software Design, Design Principles, Modular Design, Software Architecture, Design Methodologies, **Implementation:** Coding Principles, Coding Process, Code Verification, Code Documentation. **Case Study:** Construct the HLD and LLD using SRS created.
	UNIT-V: **Software Reliability And Quality Management:** Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model. **Computer Aided Software Engineering:** Case and its Scope, Case Environment, Case Support in Software Life Cycle, Other Characteristics of Case Tools, Towards Second Generation CASE Tool, Architecture of a Case Environment .	**UNIT-V:** . **Software Testing**: Testing Fundamentals, Test Planning, Black-Box Testing, White-Box Testing, Levels of Testing, Usability Testing, Regression Testing, Debugging Approaches. **Software Quality and Reliability:** Software Quality factors, Verification & Validation, Software Quality Assurance, The Capability Maturity Model, Software Reliability. **Case Study:** Write the test cases for the real time scenario considered.

	UNIT-VI **Software Maintenance:** Software maintenance, Maintenance Process Models, Maintenance Cost, Software Configuration Management. **Software Reuse**: what can be reused? Why almost No Reuse So Far? Basic Issues in Reuse Approach, Reuse at Organization Level.	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Computer Organization	Computer Organization
Course Code	R1622054	171CS4T10
Syllabus	**UNIT-I:** Basic Structure Of Computers: Functional unit, Basic Operational concepts, Bus structures, System Software, Performance, The history of computer development.	**UNIT-I:** **Basic Structure of Computers:** Computer Types, Functional Units, Basic Operational Concepts, Bus structures, Software, Performance, Historical Perspective. **Machine Instruction and Programs:** Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Stacks and Queues, Additional Instructions. **Case Study:** ARM, Motorola and Intel Instruction sets.
	UNIT-II: **Machine Instruction and Programs:** Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types, Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation. Component of Instructions: Logic Instructions, shift and Rotate Instructions	**UNIT-II:** **Arithmetic :** Addition and Subtraction of Signed Numbers, Signed-Operand Multiplication, Floating-Point Numbers and Operations – IEEE Standard for Floating-Point Numbers, Arithmetic Operations on Floating-Point Numbers. **Basic Processing Unit:** Some Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Micro **programd** Control - Microinstructions, Micro program Sequencing, Wide Branch Addressing, Microinstructions with Next –Address Field.
	UNIT-III: Type of Instructions: Arithmetic and Logic Instructions, Branch Instructions, Addressing Modes, Input/output Operations	**UNIT-III:** **The Memory System:** Some Basic Concepts, Read-Only Memories - ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size and Cost, Cache

		Memories - Mapping Functions, Replacement Algorithms, Performance considerations – Interleaving, Hit Rate and Miss Penalty, Virtual Memories, Memory Management Requirements, Secondary Storage.
	UNIT-IV: **INPUT/OUTPUTORGANIZATION:** Accessing I/O Devices, Interrupts: Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses: Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB)	**UNIT-IV:** **Input/Output Organization:** Accessing I/O Devices, Interrupts - Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, modes of transfer –**Programd** I/O, Interrupt initiated I/O & Direct Memory Access, Buses - Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interfaces - Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB).
	UNIT-V: **The MEMORY SYSTEMS:** Basic memory circuits, Memory System Consideration, Read- Only Memory: ROM, PROM, EPROM, EEPROM, Flash Memory, Cache Memories: MappingFunctions, INTERLEAVING **Secondary Storage:** Magnetic Hard Disks, Optical Disks,	**UNIT-V:** **Pipelining :** Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets, Datapath and Control Considerations, Superscalar Operation.
	UNIT-VI Processing Unit: Fundamental Concepts: Register Transfers, Performing An Arithmetic Or Logic Operation, Fetching A Word From Memory, Execution of Complete Instruction, Hardwired Control, Micro programmed Control: Microinstructions, Micro program Sequencing, Wide Branch Addressing Microinstructions with next –Address Field	

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Java Programming Lab	Java Programming Lab
Course Code	R1622058	171CS4L03
Syllabus	Exercise - 1 (Basics) a). Write a JAVA program to display default value of all primitive data type of JAVA b). Write a java program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root. c). Five Bikers Compete in a race such that they drive at a constant speed which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all 5 racers. Take as input the speed of each racer and print back the speed of qualifying racers. d) Write a case study on public static void main(250 words) Exercise - 2 (Operations, Expressions, Control-flow, Strings) a). Write a JAVA program to search for an element in a given list of elements using binary search mechanism. b). Write a JAVA program to sort for an element in a given list of elements using bubble sort (c). Write a JAVA program to sort for an element in a given list of elements using merge sort. (d) Write a JAVA program using StringBufferto delete, remove	1.1) Write a Java program to find the discriminent value D and find out the roots of **Week 1 (Basic Programs)** the quadratic equation of the form ax2+bx+c=0. 1.2) Five Bikers Compete in a race such that they drive at a constant speed which may or may not be the same as the other. To qualify the race, the speed of a racer must be more than the average speed of all 5 racers. Take as input the speed of each racer and print back the speed of qualifying racers. **Week 2** (Control Flow Statements) 2.1) Write a Java program to select all the prime numbers within the range of 1 to 10000. 2.2) Write a Java program to Find the sum of all even terms in the Fibonacci sequence up to the given range N. 2.3) Write a Java program to check whether a given N digit number is Armstrong or not. **Week 3** (Class Mechanism) 3.1) Write a Java program to display the details of a person. Personal details should be given in one method and the qualification details in another method. 3.2) Write a Java program to implement constructor. 3.3) Write a Java program to implement

	character. Exercise - 3 (Class, Objects) a). Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method. b). Write a JAVA program to implement constructor. Exercise - 4 (Methods) a). Write a JAVA program to implement constructor overloading. b). Write a JAVA program implement method overloading. Exercise - 5 (Inheritance) a). Write a JAVA program to implement Single Inheritance b). Write a JAVA program to implement multi level Inheritance c). Write a java program for abstract class to find areas of different shapes Exercise - 6 (Inheritance - Continued) a). Write a JAVA program give example for "super" keyword. b). Write a JAVA program to implement Interface. What kind of Inheritance can be achieved? **Exercise - 7** (Exception) a).Write a JAVA program that describes exception handling mechanism b).Write a JAVA program Illustrating Multiple catch clauses **Exercise – 8** (Runtime Polymorphism) a). Write a JAVA program that implements Runtime polymorphism b). Write a Case study on run time polymorphism, inheritance that implements in above problem **Exercise – 9** (User defined Exception) a). Write a JAVA program for creation of Illustrating throw b). Write a JAVA program for creation of Illustrating finally c). Write a JAVA program for creation of Java Built-in Exceptions	method overloading. **Week 4** (Arrays) 4.1) Write a Java program to perform addition and multiplication of two matrices. 4.2) Write a Java program to implement binary search. 4.3) Write a Java program to sort the elements using Quick sort. **Week 5** (Strings) 5.1) Write a Java program to sort given set of strings. 5.2) Write a Java program for using StringBuffer to remove or delete a character. 5.3) Write a Java program to find the number of tokens in a given string without using countTokens() method but by using other methods of StringTokenizer class. **Week 6** (Inheritance, Interface & Abstract Class) 6.1) Write a Java program to find the available balance in a customer account. Customer's account details should be taken as input in one class, Transaction details should be taken in another class. (Note: Make use of Multi-Level Inheritance.) 6.2) Take the details of internal exam marks in one Interface. Take the details of external exam marks in another interface. Write a Java program to find the total marks obtained in each subject by a student. (Note: Make use of Multiple Inheritance using interfaces.) 6.3) Write a Java program to find the areas of different shapes using abstract classes. **Week 7** (Packages) 7.1) Write a Java program to illustrate the use of classpath using Java code. 7.2) Write a Java program that import

	d).Write a JAVA program for creation of User Defined Exception **Exercise – 10** (Threads) a). Write a JAVA program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds ,(Repeat the same by implementing Runnable) b). Write a program illustrating **isAlive** and **join ()** c). Write a Program illustrating Daemon Threads. **Exercise - 11** (Threads continuity) a).Write a JAVA program Producer Consumer Problem b).Write a case study on thread Synchronization after solving the above producer consumer problem **Exercise – 12** (Packages) a). Write a JAVA program illustrate class path b). Write a case study on including in class path in your os environment of your package. c). Write a JAVA program that import and use the defined your package in the previous Problem **Exercise - 13** (Applet) a).Write a JAVA program to paint like paint brush in applet. b) Write a JAVA program to display analog clock using Applet. c). Write a JAVA program to create different shapes and fill colors using Applet. **Exercise - 14** (Event Handling) a).Write a JAVA program that display the x and y position of the cursor movement using Mouse. b).Write a JAVA program that identifies key-up key-down event user entering text in a	and use user defined package. 7.3) Write a Java program to illustrate the use of protected members in a package. **Week 8 (Exception Handling)** 8.1) Write a Java program to illustrate exception handling mechanism using multiple catch clauses. 8.2) Write a Java program to make use of Built-in and user-defined Exceptions in handling a run time exception. **Week 9** (Multithreading) 9.1) Write a Java program to demonstrate the use of demon thread. 9.2) Write a Java program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds, (Repeat the same by implementing Runnable). 9.3) Write a Java program to solve Producer-Consumer problem using synchronization. **Week 10** (Applets) 10.1) Write a Java program to demonstrate the Life Cycle of an applet. 10.2) Write a Java program to draw different shapes and fill each shape with a colour using applets. **Week 11** (Event Handling) 11.1)Write a Java program to illustrate the Keyboard Events by using an applet code. 11.2) Write a Java program to illustrate the Mouse Events by using an applet code. **Week 12 (AWT & Swings)** 12.1) Write a Java program to generate a simple calculator using AWT components. 12.2) Write a Java program to create a single ball bouncing inside a JPanel.

	Applet. **Exercise - 15** (Swings) a).Write a JAVA programto build a Calculator in Swings b). Write a JAVA program to display the digital watch in swing tutorial. **Exercise – 16 (Swings - Continued)** a). Write a JAVA program that to create a single ball bouncing inside a JPanel. b). Write a JAVA program JTree as displaying a real tree upside down	**List of Augmented Experiments:** (Any 2 of the following experiments can be performed) 13) Create an interface which consists of methods with the name's no of watt's consumable, luminescent value, efficiency in percentage. Write classes for different categories of bulbs like LED, tube light and find out which light is efficient in terms of consumption. 14) Write a Java program to display analog clock using Applet. 15) Write a Java program to create a menu of a restaurant which includes starters, veggies, delights etc. Ask the user to select the items from the menu and generate bill for those items which he has chosen. (Make use of Swing Components). 16) Write a Java program to display all drives in our system as a tree structure using JTree.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Database Management System Lab	Database Management System Lab
Course Code	R1631058	171CS4L04
Syllabus	SQL 1. Queries to facilitate acquaintance of Built-In Functions, String Functions, Numeric Functions, Date Functions and Conversion Functions. 2. Queries using operators in SQL 3. Queries to Retrieve and Change Data: Select, Insert, Delete, and Update 4. Queries using Group By, Order By, and Having Clauses 5. Queries on Controlling Data: Commit, Rollback, and Save point 6. Queries to Build Report in SQL *PLUS 7. Queries for Creating, Dropping, and Altering Tables, Views, and Constraints 8. Queries on Joins and Correlated Sub-Queries 9. Queries on Working with Index, Sequence, Synonym, Controlling Access, and Locking Rows for Update, Creating Password and Security features PL/SQL 10. Write a PL/SQL Code using Basic Variable, Anchored Declarations, and Usage of Assignment Operation 11. Write a PL/SQL Code Bind and Substitution Variables. Printing in PL/SQL	Week 1 1) Queries for Creating, Altering and Dropping Tables, Views and Constraints. Week 2 2) Queries to Retrieve and Change Data: Select, Insert, Delete and Update. 4.1) Queries using Group By, Order By, and Having Clauses. 4.2) Queries on Controlling Data: Commit, Rollback, and Save point. Week 3 3.1) Queries to facilitate acquaintance of Built-in Functions: String Functions, Numeric Functions, Date Functions and Conversion Functions. 3.2) Queries using operators in SQL. Week 4 Week 5 5) Queries on Joins and Correlated Sub-queries. Week 6 6) Queries on Working with Index, Sequence, Synonyms. Week 7 7) Queries to Build Views. PL/SQL Week 8 8) Write a PL/SQL Code using Basic Variables and Usage of Assignment Operation. Week 9 9) Write a PL/SQL Code to Bind and Substitute variables in PL/SQL.

	12. Write a PL/SQL block using SQL and Control Structures in PL/SQL 13. Write a PL/SQL Code using Cursors, Exceptions and Composite Data Types 14. Write a PL/SQL Code using Procedures, Functions, and Packages FORMS 15. Write a PL/SQL Code Creation of forms for any Information System such as Student Information System, Employee Information System etc. 18 16. Demonstration of database connectivity	Week 10 10) Write a PL/SQL block using SQL and Control Structures. Week 11 11) Write a PL/SQL Code using Cursors, Exceptions and Composite Data Types. Week 12 12) Write a PL/SQL Code using Procedures, Functions, Packages. List of Augmented Experiments: (Any 2 of the following experiments can be performed) 13) For a Sales Order Database System, based on the given E-R diagram

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Software Testing Methodologies	Software Testing Methodologies
Course Code	RT41054	R1632054
Syllabus	**UNIT-I:** **Software Testing:** Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing **Software Testing Terminology and Methodology:** Software Testing Terminology, Software Testing Life Cycle, relating test life cycle to developmentlife cycle Software Testing Methodology.	**UNIT-I:** **Introduction:** Purpose of Testing, Dichotomies, Model for Testing, Consequences of Bugs,Taxonomy of Bugs. **Flow graphs and Path testing:** Basics Concepts of Path Testing, Predicates, Path Predicates andAchievable Paths, Path Sensitizing, Path Instrumentation, Application of Path Testing.
	UNIT-II: **Verification and Validation:** Verification & Validation Activities, Verification, Verification of Requirements, High level and low level designs, How to verify code, Validation **Dynamic Testing I: Black Box testing techniques:** Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing	**UNIT-II:** **Transaction Flow Testing:** Transaction Flows, Transaction Flow Testing Techniques. **Dataflow testing:** Basics of Dataflow Testing, Strategies in Dataflow Testing, Application Of Dataflow Testing.
	UNIT-III: Dynamic Testing II: White-Box	**UNIT-III:** Domain Testing: Domains and Paths,

	Testing: need, Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing, mutation testing Static Testing: inspections, Structured Walkthroughs, Technical reviews	Nice & Ugly Domains, Domain testing, Domains And Interfaces Testing, Domain and Interface Testing, Domains and Testability. Paths, Path products and Regular expressions: Path Products & Path Expression, Reduction Procedure, Applications, Regular Expressions & Flow Anomaly Detection.
	UNIT-IV: **Validation activities:** Unit testing, Integration Testing,. Function testing, system testing, acceptance testing **Regression testing:** Progressives Vs regressive testing, Regression testability, Objectives of regression testing, When regression testing done?, Regression testing types, Regression testing techniques	**UNIT-IV:** **Syntax Testing:** Why, What and How, A Grammar for formats, Test Case Generation, Implementation and Application and Testability Tips. **Logic Based Testing:** Overview, Decision Tables, Path Expressions, KV Charts, and Specifications.
	UNIT-V: . **Efficient Test Suite Management:** Test case deisgn Why does a test suite grow, Minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite **Software Quality Management:** Software Quality metrics, SQA models Debugging: process, techniques, correcting bugs, Basics of testing management tools, test link and Jira	**UNIT-V:** . **State, State Graphs and Transition Testing:** State Graphs, Good & Bad State Graphs, State Testing, and Testability Tips. **Graph Matrices and Application:-** Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm.
	UNIT-VI **Automation and Testing Tools:** need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for	**UNIT-VI** **Software Testing Tools**: Introduction to Testing, Automated Testing, Concepts of Test Automation, Introduction to list of tools

	automated testing, overview of some commercial testing tools. **Testing Object Oriented Software:** basics, Object oriented testing **Testing Web based Systems:** Challenges in testing for web based software, quality aspects, web engineering, testing of web based systems, Testing mobile systems	like Win runner, Load Runner, Jmeter, About Win Runner ,Using Win runner, Mapping the GUI, Recording Test, Working with Test, Enhancing Test, Checkpoints, Test Script Language, Putting it all together, Running and Debugging Tests, Analyzing Results, Batch Tests, Rapid Test Script Wizard.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Management Science	Management Science
Course Code	RT32054	R1632054
Syllabus	UNIT-I Introduction to Management: Concept –nature and importance of Management –Generic Functions of Management – Evaluation of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization-Organizational typology- International Management: Global Leadership and Organizational behavior Effectiveness(GLOBE) structure	**UNIT-I** Introduction to Management: Concept nature and importance of Management, Generic Functions of Management, and Evaluation of Management thought, Theories of Motivation, Decision making process, Designing organization structure, Principles of organization & Organizational typology
	UNIT-II Operations Management: Principles and Types of Management – Work study- Statistical Quality Control- Control charts (P-chart, R-chart, and C-chart) Simple problems- Material Management: Need for Inventory control- EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis).	**UNIT-II** Operations Management : Principles and Types of Management, Work study, Statistical Quality Control, Control charts (P-chart, R-chart, and C-chart) Simple problems, Material Management: Need for Inventory control, EOQ, ABC analysis (simple problems) and Types of ABC analysis (HML, SDE, VED, and FSN analysis), Justin- Time(JIT) system, Total Quality Management(TQM), Six sigma, Supply chain management
	UNIT-III: Functional Management: Concept of HRM, HRD and PMIR- Functions of HR Manager- Wage payment	UNIT-III Functional Management :Concept of HRM, HRD and PMIR, Functions of HR Manager, Wage payment plans(Simple Problems),Job Evaluation

	plans(Simple Problems) – Job Evaluation and Merit Rating - Marketing ManagementFunctions of Marketing – Marketing strategies based on product Life Cycle, Channels of distributions. Operationlizing change through performance management.	and Merit Rating, Marketing Management, Functions of Marketing, Strategies based on product Life Cycle, Channels of distributions.
	UNIT-IV: Project Management: (PERT/CPM): Development of Network – Difference between PERT and CPM Identifying Critical Path- Probability- Project Crashing (Simple Problems)	**UNIT-IV:** Project Management: Development of Network, Difference between PERT and CPM, Identifying Critical Path, Probability, Project Crashing (Simple Problems).
	UNIT-V: . Strategic Management: Vision, Mission, Goals, Strategy – Elements of Corporate Planning Process – Environmental Scanning – SWOT analysis- Steps in Strategy Formulation and Implementation, Generic Strategy Alternatives. Global strategies, theories of Multinational Companies.	**UNIT-V:** . Strategic Management :Vision, Mission, Goals, Strategy, Elements of Corporate Planning Process, Environmental Scanning ,SWOT analysis, Steps in Strategy Formulation and Implementation, Generic Strategy Alternatives, Basic concepts of MIS, ERP, Capability Maturity Model(CMM) Levels, Balanced Score Card.

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Department of Petroleum Technology

Syllabus revision Index 2018-2019

S.No	Name of the course	Percentage of syllabus change
1.	Probability & Statistics	25
2.	Complex Variables	25
3.	Drilling Technology	72
4.	Petroleum Production Engineering	20

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Department of Petroleum Technology

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	PETROLEUM PRODUCTION ENGINEERING AND DESIGN	PETROLEUM PRODUCTION ENGINEERING
Course Code	RT32273	R1632272
Syllabus	UNIT-VI Production Stimulation: Well problem identification - Matrix acidizing- Hydraulic fracturing	UNIT-VI: Production Optimization: Self flowing wells, wells on gas lift, wells on sucker rod, separator, pipeline network, gas lift facilities, producing fields.

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		selection method. Cementation: Introduction cement slurries- Typical field calculations- Cementing nomenclature- Cement additives – Cementation of liners.
	UNIT-V Directional drilling: Applications- Well planning- Down-hole motors- Deflection tools and techniques- Face orientation- Direction control with rotary assemblies- Navigation drilling systems- Fishing operations- Bi-centric bits.	UNIT-V: Directional drilling: Applications- Well planning- Down-hole motors- Deflection tools and techniques- Face orientation- Direction control with rotary assemblies- Navigation drilling systems;. Horizontal wells–Well profile design considerations – Torque and drag – Horizontal borehole stability – Extended reach well design – Multilateral wells.
	UNIT-VI Stuck pipe, well control: Kicks- Kick control- Pressure control theory- BOP-Special kick problems and procedures to free the pipes and Fishing operations. Driller's logs: Sample logs- Miscellaneous logging devices.	UNIT-VI: Stuck pipe, well control: Kicks- Kick control- Pressure control theory- BOP-Special kick problems and procedures to free the pipes and Fishing operations. Types of fishing tools, Case studies of blow out control.

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Department of Agricultural Engineering

Syllabus revision Index 2018-19

S.No	Name of the course	Percentage of syllabus change
1	Principles of Soil Science and Agronomy	20
2	Renewable Energy Sources	20
3	Properties and Strength of Materials	20
4	Electrical and Electronics Engineering	25
5	Heat and Mass Transfer	20
6	Fluid Mechanics and Open Channel Hydraulics	20
7	Surface Water Hydrology	20

Department of Agricultural Engineering

1.1.2. Table-Prior/Post revision of syllabus

1	Regulation	Pre-Revision	Post-Revision
	Course Title	Principles of soil science and agronomy	Principles of soil science and agronomy
	Course Code	16A91A3501	171AG3T01
	Syllabus	**Unit –I:** Soil: Definition –soil as a three phase four component system-branches of Soil science difference between surface and sub surface soil, Rocks: Definition – classification of rocks based on mode of formationigneous sedimentary and metamorphic rocks, Minerals: Definition, classification, primary, secondary, essential, accessory, silicate, non silicate minerals, light and heavy minerals primary silicate minerals; quartz, feldsparsmicas pyroxenes amphiboles secondary silicate; secondary minerals, Ca, Mg, S and Micronutrient containing minerals-chemical formulate, Weathering:- Definition-types of weathering physical weathering of rocks, agents of physical weathering, temperature, water, wind and glaciers, Chemical weathering, solution, hydration, hydrolysis carbonation-oxidation-reduction biological weathering role of plants and animals in weathering. Soil formation: Soil forming factors – active and passive soil factors and their role in soil formation, Soil forming processes: Elluviation, illuviation, humification, calcification, laterization, podzolozation, salinization, alkalization and gleization, Soil Profile, Detailed description of theoretical soil profile, Soil physical properties:- Soil separates and their properties. Specific surface, soil texture-definition-textural classes-	**UNIT –I** **Soil:** Definition -branches of Soil science difference between surface and sub surface soil, Rocks: Definition – classification of rocks based on mode of formation igneous, sedimentary and metamorphic rocks, Minerals: Definition, classification, primary, secondary, essential, accessory, silicate, non-silicate minerals, light and heavy minerals primary silicate minerals; quartz, feldsparsmicas pyroxenes amphiboles secondary silicate; secondary minerals, Ca, Mg, S and Micronutrient containing minerals-chemical formulate. **Weathering:** Definition-types of weathering physical weathering of rocks, agents of physical weathering, temperature, water, wind and glaciers, Chemical weathering, solution, hydration, hydrolysis carbonation-oxidation-reduction biological weathering role of plants and animals in weathering. Soil formation: Soil forming factors –active and passive soil factors and their role in soil formation, Soil forming processes: Eluviations, illuviation, humification, calcification, laterization, podzolozation, salinization, alkalization and gleization, Soil Profile, Detailed description of theoretical soil profile.

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		methods of determination of soil texture, importance of soil structure	
		Unit:- II Soil structure; Definition-classification based on type, class and grade, factors influencing formation of aggregates-importance and management of soil structure, Soil structure; Definition-classification based on type, class and grade-factors influencing formation of aggregates-importance and management of soil structure, Soil consistency; Definition-forms of consistency and importance of soil consistency, Bulk density and particle density; factors influencing and their importance; porosity – types-calculation-importance, Soil water; structure o f water and the effect of H-bonding on properties of water retention of water in soils-soil moisture tension-soil moisture potential –soil moisture constants. Soil water movement; saturated, unsaturated and vapour flows, laws governing water flow-Darcy's and poiseuille's law- Infiltration; Factors-importance. Evaporation; Factors influencing evaporation-Ways to minimize it-soil mulch-organic mulch etc, Soil air; Composition of soil air-processes of gaseous exchange –soil aeration indices –and their importance (oxygen content-ODR-aeration porosity-redox potential) management of soil air, Soil temperature; influence of soil temperature on plant growth-factors influencing soil temperature-management of soil temperature. Soil color determination importance, Soil colloids:-Definition-general properties-inorganic and organic colloids origin of charge on colloids (positive & negative)	**UNIT- II** **Physical properties of soil** **Soil structure:** Definition-classification based on type, class and grade, factors influencing formation of aggregates-importance and management of soil structure, Soil structure; Definition- classification based on type, class and grade-factors influencing formation of aggregates-importance and management of soil structure. **Soil consistency:** Definition-forms of consistency and importance of soil consistency, Soil air; Composition of soil air-processes of gaseous exchange –soil aeration indices –and their importance (oxygen content-ODR-aeration porosity-redox potential) management of soil air, Soil temperature; influence of soil temperature on plant growth-factors influencing soil temperature-management of soil temperature. Soil color determination and importance
		Unit-III: Secondary silicate clay minerals (inorganic soil colloids) Kaolinite montmoriloniteillite their tructures and properties, Ion exchange, Cation and anion exchange –factors influencing ion exchange capacity	**UNIT-III** **Ion exchange**: Cation and anion exchange –factors influencing ion exchange capacity of soils importance of ion exchange calculation of base saturation and exchangeable acidity, Soil organic matter: importance of

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		of soils importance of ion exchange calculation of base saturation and exchangeable acidity, Soil organic matter: importance of organic matter CN ration of organic matter and its importance, Soil biology;- Soil flora and fauna their characteristics role of beneficial organisms mineralization– immobilization, nitrogen fixation, nitrification, denitrification, solubilization of phosphorus and sulphur, Soil fertility:- Concepts of soil fertility and soil productivity:- definitions and differences Arnon's criteria of essentiality-essential and beneficial elements-factors influencing availability of nutrients. Problem Soils:- Definition – Physical problems soil depth slope soil crust soil compaction drainage submergence (formation-adverse effects-effect on soil properties and plant growth management), Chemical problems –classification acid, saline, saline saline-sodic and calcareous soilscharacteristics-nutrient availability in problem soils and their reclamation	organic matter CN ration of organic matter and its importance. **Soil biology:** Soil flora and fauna their characteristics role of beneficial organisms mineralization– immobilization, nitrogen fixation, nitrification, denitrification, solubilization of phosphorus and sulphur, Soil fertility; Concepts of soil fertility and soil productivity; definitions and differences Arnon's criteria of essentiality-essential and beneficial elements-factors influencing availability of nutrients. Chemical problems –classification acid, saline, saline saline-sodic and calcareous soils characteristics-nutrient availability in problem soils and their reclamation
		Unit-IV: Irrigation water:- Quality of irrigation water-classification based on EC, SAR,RSC and Boron content-use of saline waters in agriculture, Soil taxonomy:- New comprehensive system of soil classification (7^{th} approximation) soil orders and their characteristics, Important soil groups of India:- Alluvial soils-black soils –red soils laterite soils and coastal soils. Meaning and scope of agronomy, History of agricultural development in ancient India, Agriculture in civilization era, National and International Agricultural Research Institutes in India, Classification of crops, Classification of field crops, According to Origin, Botanical Commercial, Economical, seasonal, Ontogeny, Agronomic, Lead Morphology and Special Purpose crops, Definition of climate and weather, Definition of meteorology, Climatology, Agri-meteorology,	**UNIT-IV** **Classification of field crops:**National and International Agricultural Research Institutes in India, Classification of crops, Classification of field crops, According to Origin, Botanical Commercial, Economical, seasonal, Ontogeny, Agronomic, Lead Morphology and Special Purpose crops, Definition of climate and weather, Definition of meteorology, Climatology, Agri-meteorology, Introduction, scope and practical utility of Agricultural meteorology, composition and structure of atmosphere, Influence of weather on crop grain development, essential Resources for crop production, factors influencing plant growth, Biotic and A biotic factors.-Agro climatic zones of A.P. and India

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		Introduction, scope and practical utility of Agricultural meteorology, composition and structure of atmosphere, Influence of weather on crop grain development, essential Resources for crop production, factors influencing plant growth, Biotic and Abiotic factors, Crop seasons, Kharif, Rabi and summer seasons in A.P.-Agro climatic zones of A.P. and India	
		Unit-V: Tillage and tilth, Objective of tillage, characteristic of good seed bed, effect of tillage on soil properties (Pore space, texture, structure, bulk density, colour of the soil), Types of Tillage, preparatory cultivation, inter cultivation, after cultivation and preparatory cultivation for lowland rice pudding, implement used for seed bed preparation, sowing, inter-cultivation and special operation, Sowing, Methods of sowing, time and depth of sowing of major agricultural crops, Methods and time of application of manure and fertilizers. **Unit – VI:** Weeds- Influence of weeds on crop production, principles and practices of weed management, Basics on soil plant-water relationship, Types of Soil Erosion, Factors influencing soil erosion, Soil conservation, erosion preventive measures, Agronomic measures for soil and water conservation, Dry land Agriculture, Problems of Crop production in dry farming, Agronomic measure in reducing evapo-transpiration losses, Watershed management, aims and Objectives, Organic farming-Sustainable Agriculture, Definition, Principles and importance	**UNIT-V** **Tillage and Tilth:** Objective of tillage, characteristic of good seed bed, effect of tillage on soil properties (Pore space, texture, structure, bulk density, colour of the soil), Types of Tillage. **Sowing:** Methods of sowing, time and depth of sowing of major agricultural crops, Methods and time of application of manure and fertilizers. **Weeds:** Influence of weeds on crop production, principles and practices of weed management., Dry land Agriculture, Problems of crop production in dry farming, Agronomic measure in reducing evapo-transpiration losses, Organic farming-Sustainable Agriculture

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2	Regulation	Pre-Revision	Post-Revision
	Course Title	Renewable Energy Sources	Renewable Energy Sources
	Course Code	R1621352	171AG3T02
	Syllabus	**UNIT – I** **PRINCIPLES OF SOLAR RADIATION**: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data. Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors	**UNIT – I** **Introduction:** Role and potential of renewable energy source, Status of renewable energy in India. **Principle of solar radiation:** Physics of the sun, the solar constant, solar radiation at the earth surface, solar radiation geometry, problems, solar radiation measurements, solar radiation on titledsurface. **Solar energy collectors:** Flat plate and concentrating collectors, classification of concentrating collectors, advanced collectors, performance parameter
		UNIT-II **SOLAR ENERGY STORAGE AND APPLICATIONS:** Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications-solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion. Wind Energy Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria	**UNIT – II** **Solar Energy Storage and Applications:** Different methods, Sensible, latent heat, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, problems, solar water pumping and cooking. Environmental impact of solar power, **Wind Energy:** Potentials, site selection, horizontal and vertical axis windmills, power in the wind, problems, applications (wind pump), performance characteristics, Betz criteria
		UNIT-III **BIO-MASS:** Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects	**UNIT – III** **Bio-nergy:** biomass,classification, methods and principle of bio mass conversion, Anaerobic/aerobic digestion, biogas, types of Bio-gas digesters, combustion characteristics of bio-gas, classification of biogas plants, biogas plant design, problems. **Bio-diesel:** Need, feed stock, bio-diesel production methods (Transesterification), applications

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		UNIT-IV **GEOTHERMAL ENERGY:** Resources, types of wells, methods of harnessing the energy, potential inIndia	**UNIT – IV** **Geothermal Energy:** Resources, methods of harnessing the energy, applications, potential in India. **Ocean energy:** OTEC, Principles utilization, method of OTEC power generation, Tidal and wave energy: Potential, principle and conversion techniques, mini-hydel power plants, and their economics
		UNIT-V **OCEAN ENERGY:** OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics. **UNIT-VI** **DIRECT ENERGY CONVERSION**: Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, seebeck, peltier and Joule-Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions	**UNIT – V** **Direct Energy Conversion**: Thermo-electric generators, seebeck, peltier and Joule-Thomson effects, Figure of merit, materials, applications, MHD generators, principles, power generation systems, MHD accelerator, materials, applications. Fuel cells, principles, classification, applications

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3	Regulation	Pre-Revision	Post-Revision
	Course Title	Properties and Strength of Materials	Properties and Strength of Materials
	Course Code	R1621354	171ES3T19
	Syllabus	**Unit- I:** Properties of Engineering Materials, Classifications of Rocks, Sources of Stones and Natural bed of Stones, Properties, Varieties and uses of stones, Properties, Composition and uses of Bricks, Classification and tests of bricks, Properties, varieties and uses of Tiles, Properties, varieties and uses of Lime, Properties, varieties and uses of Cement, Properties, varieties and uses of Cement Mortar, Properties	**UNIT I** **Properties of Engineering Materials:** Properties of Engineering Materials, Properties, Composition and uses of Bricks; Classification and tests of bricks; Properties and uses of Tiles, Lime, Cement, Cement Mortar, Concrete, Sand, Paints, Varnishes, and Distempers
		Unit - II Varieties and uses of Concrete, Properties, varieties and uses of Sand, Properties, varieties and usesof Paints, Properties, varieties and uses of Varnishes, Properties, varieties and uses of Distempers. Characteristics and uses of Glass, Characteristics and uses of Rubber, Characteristics and uses of Plywood, Characteristics and uses of Plastics	**UNIT II** **Characteristics and Uses of Engineering Materials:** Characteristics and uses of Glass, Rubber, Plywood, Wrought Iron, Cast Iron, Steel, Aluminium, Copper, Nickel; Alloys of Aluminium, Copper, Nickel and its properties. Definition and Types of Timber (Seasoning of Timber, Industrial Timber) and uses of Timber
		Unit-III: Characteristics and uses of Wrought Iron, Characteristics and uses of Cast Iron, Characteristics and uses of Steel, Characteristics and uses of Aluminium, Characteristics and uses of Copper, Characteristics and uses of Nickel, Alloys of Aluminium and its properties, Alloys of Copper and its properties, Alloys of Nickel and its properties, Definition and Types of Timber, Seasoning of Timber, Industrial Timber and uses of Timber, Methods of heat treatment of Steel	**UNIT III** **Simple Stresses and Strains:** Introduction – Stresses, Tensile, Compressive and Shear-strains, Units-Elastic Curve- Elastic Limit – Poisons Ratio, Stresses in uniformity tapered circular sections- Stresses in bars of composite, Sections, Thermal Stresses and Strains in simple bars and composite bars, Elastic Constants- Young's Modulus (E), Bulk Modulus (K) and shear Modulus (G)- Relation between them. **Complex Stresses and Strains:** Stresses on oblique planes, Mohr's Circle method- Direct stressesin one plane and two planes- accompanied by shear stress

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		Unit-IV: Introduction – Stresses, Tensile, Compressive and Shear-strains, Units-Elastic Curve- Elastic Limit – Poisons Ratio, Stresses in uniformity tapered circular sections- Stresses in bars of composite , Sections, Thermal Stresses and Strains in simple bars and composite bars, Elastic Constants- Young's Modulus (E), Bulk Modulus 9K0 and shear Modulus (G)- Relation between them, Stresses on oblique planes, Mohr's Circle method- Direct stresses in one plane, Direct Stresses in two planes-accompanied by shear stress. Deflection of beams, Relation between slope, deflection and radios of curvature. Methods of finding out slopes & deflections of beams, Double integration method. Slope and Deflection equations off a simply supported beam with a central point load, simply supported beam with eccentric point load. Simply supported beam with a uniformly distributed load, Columns and Struts	**UNIT – IV** **SFD and BMD for Beams:** Shear force and bending moment diagrams for different beams underpoint loads and udl loading condition. **Deflection of Beams:** Deflection of beams, Relation between slope, deflection and radios of curvature. Methods of finding out slopes & deflections of beams, Double integration method. Slope and Deflection equations off a simply supported beam with a central point load, simply supported beam with eccentric point load. Simply supported beam with a uniformly distributed load. **Columns:** Euler's column theory. Assumptions of Euler's column theory, Buckling load, Types of end conditions of columns; both ends hinged, both ends fixed, one end fixed and other hinged, Expression for buckling load of a column with one end fixed other free- with one end fixed and other hinged Expression for buckling load of a column with both ends hinged- with both ends. Limitations of Euler's formula-Rankine's formula for columns
		Unit-V: Euler's column theory. Assumptions of Euler's column theory, Buckling load-derivations, Types of end conditions of columns; both ends hinged, both ends fixed, one end fixed and other hinged, Expression for buckling load of a column with one end fixed other free- with one end fixed and other hinged Expression for buckling load of a column with both ends hinged- with both ends. Fixed Types of end conditions of columns; both ends hinged, both ends fixed, one end fixed and other is hinged & one end fixed and other end is free. Types of end conditions of columns; both ends hinged, both ends fixed, one end fixed and other is hinged & one end fixed and other end is free. Limitations of euler's formula-Rankine's formula for columns.	**UNIT V** **Connections in Steel Structures:** Riveted joints, types of joints-strength of a rivet and riveted joint-efficiency of a riveted joint. Design of riveted joints, Welded joint, types of welded joints, Strength of welded joints and technical terms. Design of welded joints

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		Unit-VI: Riveted joints, types of joints-strength of a rivet and riveted joint-efficiency of a riveted joint Design ofriveted joints, Eccentric riveted connections, Welded joist, types of welded joints, Strength of welded joints, technical terms. Design of welded joints, eccentric welded joints. Design of welded joints, eccentric welded joints. Dams, forces acting, stressed at the base of dam. Stability of dams, design of base width of dams. Propped cantilever and beams – Deflection and slope Equations, Fixed and continuous beams – Deflection and Slope Equations, Super position theorem – claypeyron's theorem of three moments, Application of Clayperon's theorem of three moments, Moment distribution methods. Analysis of statistically indeterminate beams	

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4	Regulation	Pre-Revision	Post-Revision
	Course Title	Electrical Systems	Electrical and Electronics Engineering
	Course Code	R1621355	171ES3T20
	Syllabus	**Unit- I:** Independent, Dependent Sources and Kirchoff's Laws, Maxwell's Loop current method and its problems, Nodal Voltage Method and its problems, Thevenin's Theorem and its problems, Norton's Theorem and its problems, Superposition Theorem and its problems, Reciprocity and Maximum power Transfer, Star-Delta Conversion Method and its problems. Solution of DC circuit by Network Theorems, Sinusoidal steady state response of circuits, Instantaneous and Average Methods, Concept of Power Factor, Reactive and Apparent Poser, Concept and Analysis of Balanced Polyphase circuits, Laplace Transform method of finding step response of DC circuits, Series and Parallel Resonance	**UNIT – I** **Electrical Circuits:** Independent, Dependent Sources, Ohm's law and Kirchhoff's Laws – mesh analysis - Series - Parallel circuits–Thevenin's Theorem and its problems, Superposition Theorem and its problems, Star-Delta Conversion Method and its problems. Various stators and batteries for agricultural machinery. Basic introduction to ac circuits
		Unit-II: Electromotive force, Reluctance, Magnetic circuit, Determination of Ampere Turn Hysteretic losses and eddy current losses, Transformer-working principle, Construction of single phase transformer, EMF equation of transfer, Core type transformer, shall type and difference between shell and core type transformer, Electric circuit, dielectric insulation, leakage reactance in transformer	**UNIT – II** **Transformers:** Construction of single phase transformer, EMF equation of transfer, Core type transformer, shall type and difference between shell and core type transformer, transformer test - open circuit and short circuit tests, Losses in a transformer, efficiency and Voltage regulation of transformer for various power factors
		Unit III: Voltage regulation, transformer test, open circuit and short circuit tests, Losses in a transformer efficiency of transformer, condition for maximum	**UNIT – III** **DC Machines:** Principle of operation of DC generator – EMF equation - types of DC generator –applications- DC Motor-working principle, value of back EMF, voltage equation of DC

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		efficiency, Equivalent circuit of transformer, theory of an ideal transformer, Phaser diagram of an ideal transformer, transformer on non load, Phaser diagram of transformer on load, problems solved. DC Generator, Principle of working construction, field system, armature, Commentator, other accessories of DC generator, EMF equation of DC generator, Torque equation, DC armature winding, lap winding wave winding terms used in armature winding, Armature reaction, Demagnetizing & Cross magnetizing ampere turns, methods of compensating armature reaction	motor, types of DC motors-torque equation - Factors controlling the speed, Flux control and armature control of shunt motors, three point starter and their necessity
		Unit – IV Excitation of DC generator-shunt generator, series generator, compound generator, Commutation- Resistance commutation, EMF commutation, Characteristics of DC generator-separately exited, shunt, series, compound generator, DC Motor-working principle, value of back EMF, voltage equation of DC motor, Characteristics of DC motor–Characteristics of series, shunt, compound motor, Torque of DC motor, Armature Torque, shaft Torque-efficiency of DC motor	**UNIT – IV** **AC Rotating Machines:** Principle of operation of single phase induction motor, double field revolving theory, Equivalent circuit of single phase induction motor. Three phase induction motor – working principle, production of rotation field, Construction – Stator, rotor, Slip-torque characteristics
		Unit-V: Factors controlling the speed, Flux control and armature control of shunt motors, Motors starters and their necessity, shunt motor and series motor starter, Principle of operation of single phase induction motor, double field revolving theory Equivalent circuit of single phase induction motor without core loss and with core loss, Single phase – split induction motor, shaded pole, motor, Power factor, disadvantage low power factor, power factor improvement. **Unit – VI** Measurement of power in three phase system, single watt meter,	**UNIT V** **Rectifiers &Transistors:** PN junction diodes - diode applications (Half wave and Full waverectifiers) - PNP and NPN junction transistor - transistor as an amplifier

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		two watt meter method, Measurement of power in single phase system, using current transformer and voltage transformer, Three phase induction motor – working principle, production of rotation field, Construction – Starter, rotor, operation, Torque equation, Starting (DOL, Autotransformer, Star delta starter) and speed control methods	

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5	Regulation	Pre-Revision	Post-Revision
	Course Title	Heat and Mass Transfer	Heat and Mass Transfer
	Course Code	R1622352	171AG4T05
	Syllabus	**Unit – I:** Introductory concepts, application of Heat and mass transfer-modes of heat transfer examples, Fourier's law of heat transport, Introduction to steady state heat transfer –one dimensional steady state heat conduction equation. Thermal conductivity of different materials – measurement-Insulation Materials, One dimensional steady state conduction through plane and composite walls, Conduction through tubes and spheres with and without heat generation, Conduction through multilayer tubes	**UNIT-I** **Introduction:** Application of Heat and mass transfer-modes of heat transfer examples, Fourier's law of heat transport, Introduction to steady state heat transfer –one state heat conduction equation, dimensional steady **Thermal conductivity of different materials**: Measurement-Insulation Materials, One dimensional steady state conduction through plane and composite walls, Conduction through tubes and spheres with and without heat generation, Conduction through multilayer tubes
		Unit – II: Electrical analogy-conduction through materials in parallel, Combined convection and conduction and overall heat transfer coefficients-problem solving, Concept of critical thickness of insulation for a cylinder-problem solving	**UNIT-II** **Convective Heat Transfer:** Electrical analogy-conduction through materials in parallel, Combined convection and conduction and overall heat transfer coefficients-problem solving, Concept of critical thickness of insulation for a cylinder, sphere-problem solving
		Unit III: Radiation heat transfer-Introduction. Absorptivity, reflectivity and transmissivity. Black body and monochromatic radiation, Plank's law, Stefan-Boltzman law, Kichoff's law, grey bodies and emissive power, solid angle intensity of radiation, Radiation exchange between black surfaces, geometric configuration factor. Heat transfer analysis involving conduction, convection and radiation by networks	**UNIT-III** **Unsteady State Heat Transfer:** Unsteady state system with negligible internal thermal resistance equation for different geometries, Fins-heat transfer from extended surfaces-types of fins- numerical. Newton's law of cooling, heat transfer coefficient in convection. Dimensional analysis of free and forced convection
		Unit IV: Unsteady state heat transfer-unsteady state system with	**UNIT-IV** **Heat Exchangers**: Equation of laminar boundary layer on flat plate

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		negligible internal thermal resistance- equation for different geometries, Fins-heat transfer from extended surfaces-types of fins-numiricals, Free and force convection. Newton's law of cooling, heat transfer coefficient in convection. Dimensional analysis of free and forced convection. Useful non dimensional numbers and empirical relationships for free and forced convection	and a tube, Laminar forced convection on a flat plate and in a tube, Combined free and forced convection, Types of heat exchangers, fouling factor, log mean temperature difference, heat exchanger performance, transfer units, Heat exchanger analysis restricted to parallel and counter flow heat exchangers
		Unit V: Equation of laminar boundary layer on flat plate and a tube, Laminar forced convection on a flat plate and in a tube, Combined free and forced convection, Types of heat exchangers, fouling factor, log mean temperature difference, heat exchanger performance, transfer units, Heat exchanger analysis restricted to parallel and counter flow heat exchangers. **Unit – VI:** Steady state molecular diffusion in fluids at rest and in laminar flow-Flick's law mass transfer coefficients-Reynold's analogy	**UNIT-V** **Radiative Heat Transfer:** Introduction. Absorptivity, Reflectivity and Transmissivity, Black body and monochromatic radiation, Plank's law, Stefan-Boltzman law, Kichoff's law, grey bodiesand emissive power, solid angle intensity of radiation, Radiation exchange between black surfaces, geometric configuration factor. **Mass Transfer:** Steady state molecular diffusion in fluids at rest and in laminar flow-Flick's law mass transfer Coefficients-Reynold's analogy

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6	Regulation	Pre-Revision	Post-Revision
	Course Title	Fluid Mechanics and Open Channel Hydraulics	Fluid Mechanics and Open Channel Hydraulics
	Course Code	R1621351	171ES4T25
	Syllabus	**Unit – I:** Fluids-definitions-classification-properties, dimensions. Fluid pressure–introduction–Measurement of fluid pressure–peizometer tube manometry–types of manometers. Mechanical gauges-Bourdon's tube pressure gauge-Diaphragm pressure gauge–Dead weight pressure gauge. Fluid Static force on submerged surfaces–Total force on horizontal, vertical and inclined surfaces. Center of pressure of an inclined immersed surface-Centre of pressure of a composite section. Pressure on a curved surface and its applications. Kinematics of fluid flow– introduction – continuity of fluid flow – Types of flow lines	**UNIT I** **Introduction:** Fluids- definitions-classification-properties, dimensions. Fluid pressure– introduction–Measurement of fluid pressure–piezometer tube manometry–types of manometers. Mechanical gauges-Bourdon's tube pressure gauge-Diaphragm pressure gauge–Dead weightpressure gauge. Buoyancy and flotation – metacentric height **Hydro Statics & Kinematics:** Fluid Static force on submerged surfaces–Total force on horizontal, vertical and inclined surfaces. Center of pressure of an inclined immersed surface. Pressure on a curved surface and its applications. Kinematics of fluid flow– introduction – continuity of fluid flow – Types of flow lines
		Unit –II: Boundary layer theory- Thickness of Boundary layer, Thickness of Boundary layer in a laminar flow, Thickness of Boundary layer in a turbulent flow, Prandtl's Experiment of Boundary Layer separation. Dynamics of fluid flow – Various forms of energy in fluid flow, frictional loss, general equation. Bernoulli's theorem, Euler's equation of motion. Practical applications of Bernoulli's theorem, Verturimeter, pitot tube, Orifice meter	**UNIT II** **Fluid Dynamics:** Dynamics of fluid flow –Various forms of energy in fluid flow, frictional loss general equation. Euler's equation of motion, Bernoulli's theorem and Practical applications of Bernoulli's theorem, Venturimeter, Orifice meter, pitot tube. **Boundary layer theory:** Boundary layer theory- Thickness of Boundary layer, Thickness of Boundary layer in a laminar flow, Thickness of Boundary layer in a turbulent flow, **Measurement of flow:** Flow through orifices (Measurement of Discharge) – Types of orifices
		Unit – III: Buoyancy of flotation – metacentric height. Flow through orifices (Measurement of Discharge) – Types of orifices, Jet of water, vena contracta,	**UNIT-III** Jet of water, vena contracta, Hydraulic coefficients, Experimental Method for Hydraulic Coefficients, Discharge through a rectangular orifice. Flow through Mouthpieces –

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		Hydraulic coefficients, Experimental Method for Hydraulic Coefficients, Discharge through a rectangular orifice. Flow through Orifices (Measurement of Time) – Time of Emptying a square, rectangular or circular tank through an orifice at its bottom, time of emptying a hemispherical tank through an orifice at its bottom. Time of emptying a circular horizontal tank through an orifice at its bottom. Time of emptying a tank of variable cross-section through an orifice. Flow through Mouthpieces – Types of Mouthpieces – Loss of Head of a liquid flowing in a pipe, Discharge through a Mouthpiece. Flow over Notches- Types of notches, Discharge over a Rectangular Notch, Triangular Notch, Stepped Notch. Time of emptying a tank over a Rectangular Notch, Triangular Notch. Flow over weirs – Types of weirs, Discharge over a weir, Francis's formula for Discharge over a Rectangular weir (Effect of End Contractions), Bazin's formula for Discharge over a rectangular weir, velocity of approach, Determination of Velocity of Approach	Types of Mouthpieces – Loss of Head of a liquid flowing in a pipe, Discharge through a Mouthpiece. Flowover Notches-Types of notches, Discharge over a Rectangular Notch, Triangular Notch, Stepped Notch. Time of emptying a tank over a Rectangular Notch, Triangular Notch. Flow over weirs – Types of weirs, formula for Discharge over a rectangular weir, velocity of approach, Determination of Velocity of Approach
		Unit – IV: Flow through simple pipes – Loss of head in pipes, Darcy's formula for loss of Head in pipes, Chezy's formula for loss of head in pipes. Transmission of power through pipes, Time of emptying a tank through a long pipe, Time of flow from one tank into another through a long pipe. Flow through compound pipes – Discharge through a compound pipe (Pipes in series)-Discharge through pipes in parallel, Equivalent size of a pipe, Discharge through branded pipes from one reservoir to another	**UNIT IV** **Flow through pipes:** Flow through simple pipes – Loss of head in pipes, Darcy's formula for lossof Head in pipes, Chezy's formula for loss of head in pipes. Transmission of power through pipes. Flow through compound pipes – Discharge through a compound pipe (Pipes in series)-Discharge through pipes in parallel, Equivalent size of a pipe
		Unit – V Dimensional analysis and similitude – Rayleigh's method & Buckingham's pi theorem. Types	**UNIT V** **Open channel hydraulics:** classification of open channel and definitions. Chezy's formula for

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		of similarities, Dimensional analysis, dimensionless numbers, introduction to fluid machinery. Open channel hydraulics-classification of open channel and definitions. Chezy's formula for discharge through an open channel. **Unit – VI:** Bazin's formula for discharge through open channel, Numerical Problems on design through open channel, Kutter's formula for discharge, Problems on design. Manning's formula for discharge throughan open channel. Channels of most economical cross sections – Conditions for maximum discharge through a channel of rectangular section, trapezoidal section, circular section. Specific energy concept-Specific energy of a following fluid, specific energy diagram, critical depth, Type of flows, critical velocity. Velocity and Pressure profiles in open channels. Hydraulic jump, Types of Hydraulic Jumps, Depth of Hydraulic Jump, Loss of Head due to Hydraulic Jump	discharge through an open channel, Bazin's formula for discharge through open channel, Manning's formula for discharge through an open channel. Numerical Problems on design through open channel, Kutter's formula for discharge, Problems on design; Channels of most economical cross sections – Conditions for maximum discharge through a channel of rectangular section, trapezoidal section, circular section; Specific energy concept-Specific energy of a following fluid, specific energy diagram, critical depth, Type of flows, critical velocity. Velocity and Pressure profiles in open channels

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7	Regulation	Pre-Revision	Post-Revision
	Course Title	Surface Water Hydrology	Surface Water Hydrology
	Course Code	R1622355	171AG4T07
	Syllabus	**Unit-I:** Hydrology-definition, hydrology cycle and its components. Forms of Precipitation Rainfall, Characteristics of rainfall in India (types of monsoon). Measurement of Rainfall – Recording and Non-Recording Rain gauges- Rain gauge network density for different topographic conditions – Point rainfall analysis - Presentation of Rainfall data – Mass Curve and hyetograph, Mean Precipitation over an area – Arithmetic Mean, Thiessen Polygon, Isohyetal methods, DAD Relationships and curves. Probability Analysis of Rainfall – Return Period, Plotting position by Weibull's method – Rainfall events at different probability levels (20% , 40%, 60%, 80%)	**UNIT-I** **Precipitation:** Hydrology-definition, hydrological cycle and its components. Forms of Precipitation, Characteristics of rainfall in India (types of monsoon). Measurement of Rainfall – Recording and Non-Recording Rain gauges- Rain gauge network density for different topographic conditions – Point rainfall analysis - Presentation of Rainfall data – Mass Curve and hyetograph, Mean Precipitation over an area – Arithmetic Mean, Thiessen Polygon, Isohyetal methods, DAD Relationships and curves. Probability Analysis of Rainfall – Return Period, Plotting position by Weibull's method – Rainfall events at different probability levels (20%, 40%, 60%, 80%).
		Unit-II: Intensity-Duration-Frequency-Relationship ($i=((KT^x)/(D+A)^n$)Determination of net effective rainfall- infiltration indices- Phi index.. Runoff-definition-components of runoff-direct runoff and base flow, overload flow and interflows, pictorial representation of different routes of runoff. Runoff characteristics of streams – perennial, intermittent and ephemeral streams, Measurement of stream flows.	**UNIT-II** **Runoff:** definition-components of runoff-direct runoff and base flow, overload flow and interflows, pictorial representation of different routes of runoff. Runoff characteristics of streams – perennial, intermittent and ephemeral streams. Definition and Estimation of peak runoff using rational method. **Stream flow measurement:** Measurement of stream flows. Measurement of stage and velocities, staff gauge, wire gauge, automatic stage recorders, current meters (horizontal and vertical axis meters), calibration ($V= a N_S + b$). Rainfall-Runoff relations ($R=a P + b$), curve fitting and determination of 'a' and 'b' and (correlation coefficient).Intensity-Duration-Frequency- Relationship (i=

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			$((KT^x)/(D+A)^n)$. Determination of net effective rainfall-infiltration indices-Phi
		Unit-III: Measurement of stage and velocities, staff gauge, wire gauge, automatic stage recorders, current meters (horizontal and vertical axis meters), calibration ($V= a N_s + b$). Rainfall-Runoff relations ($R=a P + b$), curve fitting and determination of 'a' and 'b' and (correlation coefficient), factors affecting runoff. Definition and Estimation of peak runoff and design peak runoff rate, rational method and curve number techniques	**UNIT-III** **Hydrographs:** definition and components, factors affecting flood hydrographs, hydrograph separation for simple and complex storms – Method I, II and III. Unit Hydrograph-concept and the three implications of the definitions and the two basic assumptions. Effects of the characteristics of storms (duration of rain, time-intensity pattern, areal distribution of runoff and amount of runoff) on the shape of the resulting hydrographs. Derivation of Unit hydrographs for simple and complex storms. Derivation of an average unit hydrographs from several storms of thesame duration (proper procedure of computing average peak flow and time to peak)
		Unit-IV: Hydrographs-definitions and components, factors affecting flood hydrographs, hydrograph separationfor simple and complex storms – Method I (straight line method, $N=b A^{0.2}$), other Methods II and III. Unit Hydrographs-concept and the three implications of the definitions and the two basic assumptions (linear response and time invariance). Effects of the characteristics of storms(duration of rain, time- intensity pattern, areal distribution of runoff and amount of runoff) on the shape of the resulting hydrographs .Derivation of Unit hydrographs, average unit hydrographs from several storms of the same duration (proper procedure of computing average perk flow and time to peak). Derivation of unit hydrographs for complex storms	**UNIT-IV** **Unit Hydrographs:** The methods for conversion of unit hydrograph of different durations, (1) method of superposition and (2) S-curve. Concept of S-curve method, explanation application and determination of lower duration graph from the given higher duration graph and vice-versa. Concepts of Synthetic unit hydrograph, Snyder' synthetic unit hydrograph and formulas relating to hydrograph features (basin lag, Peak flow and time base of the unit hydrograph). Concept and application of Instantaneous unit hydrograph and SCS Triangular Hydrograph.
		Unit-V: The conversion of unit hydrograph duration, methods for unit hydrographs of different durations, (1) method of superposition and (2) S-curve. S-curve method, explanation of	**UNIT V** **Flood Routing:** Flood Routing-introduction, two broad categories of flood routing and channel routing, hydrologic routing and hydraulic routing, basic equations. Hydrologic storage routing, Schematic

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		concept and application. conversion of unit graph duration by S-curve method, determination of lower duration graph from the given higher duration graph and vice-versa. Synthetic unit hydrograph, Concept, Snyder' synthetic unit hydrograph, formulas relating hydrograph features (basin lag, Peak flow and time base of the unithydrograph). Instantaneous unit hydrograph, Concept and application, SCS Triangular Hydrograph - Application of Hydrology - Flood control and Regulation, Flood mitigation, Floodplain mapping, Retards. **Unit VI :** Flood Routing-introduction, two broad categories of flood routing and channel routing, hydrologic routing and hydraulic routing, basic equations. Hydrologic storage routing, Schematic representation of storage routing, modified Pul's method (semi-graphical method). Explanation of the features of the modified Pul's method. Flood routing through a reservoir by modified Pul's method. Applications of Hydrology in land and water management, watershed management	representation of storage routing, modified Pul's method (semi-graphical method). Explanation of the features of the modified Pul's method. Flood routing through a reservoir by modified Pul's method. Applications of Hydrology in land and water management, watershed management, Flood mitigation, Floodplain mapping, Retards, Flood control and Regulation

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Dt-25-05-2018

Department of Mining Engineering

Syllabus revision Index

2018-2019

S.No	Name of the course	Percentage of syllabus change
1	Introduction To Mining Technology	20
2	Basic Mechanical Engineering For Mines	50
3	Electrical and Electronics Lab	30
4	Fundamentals Of Rock Mechanics	50
5	Mechanical Engineering Lab	90
6	Mine Safety Engineering	30

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Dt-25-05-2018

Department of Mining Engineering

1.1.2. Table-Prior/Post revision of syllabus

2018-2019

Regulation	Pre-Revision	Post-Revision
Course Title	Development of Mineral Deposits	Introduction To Mining Technology
Course Code	R1621261	171MI3T01
	UNIT I: Various types of development openings shape and size, Selection of suitable type for actual situations raises, winzes or passes, ore chutes.	**UNIT I** : Distribution of mineral deposits in India and other countries: Mining contribution to civilization, Mining terminologies, Stages in the life of the mines Prospecting, Exploration, Development, Exploitation, Reclamation. Brief overview of Surface & Underground Mining Methods.
	UNIT II Location of shaft shape and size, incline and vertical shafts. Surface arrangements for sinking shafts, tools and equipments ordinary methods of sinking drilling, blasting removal of debris and water.	**UNIT II** : Transportation and Handling of Materials in Mines: Various types of development openings shape and size, Selection of suitable type for actual situations. Raises, winzes, ore passes, ore chutes. Shafts
	UNIT III Ventilation and lighting, temporary and permanent lining, widening and deepening of shafts	**UNIT III** : Access to Deposits Introduction to Development of Shafts Inclines: Location, shape and size of shafts/ incline. Drilling, blasting and removal of debris. Surface arrangements for sinking shafts, tools and equipment. Methods of shaft sinking.
	UNIT IV Special methods of shaft sinking piling, caisson, freezing and cementation method of shaft sinking Modern techniques of shaft sinking. Design of shafts inserts and pit bottoms	**UNIT IV** : Drivage of drifts, organization and cycle of operations: drilling, blasting, loading, transport, support, drainage, ventilation and lighting. Mechanized drifting, road heading and tunnel boring.

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Syllabus	**UNIT -V** Classification and properties of explosives, detonators. Detonating cords, and detonating fuse and nonel detonator. Blasting systems, electrical and non electrical methods, delay blasting techniques. Blasting in open pit mines, blasting in underground coal and metal mines. Mechanics of blasting.	**UNIT V** Classification and properties of explosive: Detonators. Detonating cords, and detonating fuse and nonel detonator. Blasting systems, electrical and non electrical methods, delay blasting techniques. Mechanics of blasting.
	UNIT -VI: Drivage of drifts, organization and cycle of operations, drilling, blasting, blasting patterns, loading, transport, support, drainage, ventilation and lighting. Mechanized drifting, road heading and tunnel boring.	

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Regulation	Pre-Revision	Post-Revision
Course Title	Fluid mechanics and Hydraulic machines	Basic mechanical engineering for mines
Course Code	R1621034	171MI3T02
Syllabus	**UNIT I** Fluid statics: Dimensions and units: physical properties of fluids- specific gravity, viscosity and its significance, surface tension, capillarity, vapor pressure. Atmospheric gauge and vacuum pressure – measurement of pressure. Manometers- Piezometer, U-tube, inverted and differential manometers. Pascal's law, hydrostatic law. Buoyancy and floatation: Meta center, stability of floating body. Submerged bodies. Calculation of metacenter height. Stability analysis and applications.	**UNIT-I**: Laws of Thermodynamics: First, Second & Third law of Thermodynamics and their applications.
	UNIT-II Fluid kinematics: Introduction, flow types. Equation of continuity for one dimensional flow. circulation and vorticity. Stream line, path line and streak lines and stream tube. Stream function and velocity potential function, differences and relation between them. Condition for irrotational flow, flow net, source and sink, doublet and vortex flow. Fluid dynamics: surface and body forces – Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its applications, force on pipe bend. Closed conduit flow: Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line- hydraulic gradient line.	**UNIT-II**: I. C. ENGINES: Classification - Working principles, Valve and Port Timing Diagrams, - Engine systems – Fuel, Carburetor, Fuel Injection System, Ignition, Cooling and Lubrication, principle of Wankle engine, principles of supercharging and turbo charging.
	UNIT-III: Boundary Layer Theory: Introduction, momentum integral equation, displacement, momentum and energy thickness, separation of boundary layer, control of flow separation, Stream lined body, Bluff body and its applications, basic concepts of velocity profiles. Dimensional Analysis: Similitude and modeling – Dimensionless numbers.	**UNIT-III:** Fluid statics: Dimensions and units: physical properties of fluids- specific gravity, viscosity and its significance, surface tension, capillarity, and vapor pressure. Atmospheric gauge and vacuum pressure – measurement of pressure. Manometers- Piezometer, U-tube, inverted and differential manometers. Pascal's law, hydrostatic law.
	UNIT-IV	**UNIT-IV**:

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Syllabus	Basics of turbo machinery: hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes.	Fluid kinematics: Introduction, flow types. Equation of continuity for one dimensional flow. Circulation and vorticity. Stream line, path line and streak lines and stream tube. Stream function and velocity potential function, differences and relation between them. Condition for rotational flow, flow net, source and sink, doublet and vortex flow. Fluid dynamics: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its applications, force on pipe bend. Closed conduit flow: Reynolds's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line.
	UNIT-V Centrifugal pumps: classification, working, work done – manometric head-losses and efficiencies- specific speed-pumps in series and parallel-performance characteristic curves, cavitation & NPSH. Reciprocating pumps: Working, Discharge, slip, indicator diagrams.	**UNIT-V:** Boundary Layer Theory: Introduction, momentum integral equation, displacement, momentum and energy thickness, separation of boundary layer, control of flow separation, Stream lined body, Bluff body and its applications, basic concepts of velocity profiles.
	UNIT-VI Hydraulic Turbines: classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies, hydraulic design –draft tube-theory- functions and efficiency. Performance of hydraulic turbines: Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer. Hydraulic systems- hydraulic ram, hydraulic lift, hydraulic coupling. Fluidics – amplifiers, sensors and oscillators. Advantages, limitations and applications	

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Regulation	Pre-Revision	Post-Revision
Course Title	Electrical and Electronics Engineering Lab	Electrical and Electronics Lab
Course Code	R1621036	171ES3L12
Syllabus Syllabus	The following experiments are required to be conducted as compulsory experiments: 1. Swinburne's test on D.C. Shunt machine (Predetermination of efficiency of a given D.C. Shunt machine working as motor and generator). 2. OC and SC tests on single phase transformer (Predetermination of efficiency and regulation at given power factors). 3. Brake test on 3-phase Induction motor (Determination of performance characteristics) 4. Regulation of alternator by Synchronous impedance method. 5. Speed control of D.C. Shunt motor by a) Armature Voltage control b) Field flux control method 6. Brake test on D.C. Shunt Motor. Section B: Electronics Engineering. The following experiments are required to be conducted as compulsory experiments: 1.PNjunction diode characteristics a) Forward bias b) Reverse bias (Cut in voltage and resistance calculations) 2. Transistor CE characteristics (Input and output) 3. Half wave rectifier with and with out filters. 4. Full wave rectifier with and with out filters. 5. CE amplifiers. 6. OP- Amp applications (inverting, non inverting, integrator and differentiator)	Section A: Electrical Engineering The following experiments are required to be conducted as compulsory experiments: Week 1. 1.To predetermine the efficiency of a given D.C. Shunt machine working as motor and generator using Swinburne's test Week 2. 2.To predetermine the efficiency and regulation of single phase transformer at given power factors by conducting OC and SC tests. Week 3. 3.To determine of performance characteristics of 3-phaseInduction motor by conducting Brake test. Week 4. 4.To determine the Regulation of alternator by using Synchronous impedance method. Week 5. 5.To determine the Speed control of D.C. Shunt motor by a. Armature Voltage control method b. Field flux control method Week 6. 6. To determination of performance characteristics of D.C Shunt Motor (Braketest). Section B: Electronics Engineering The following experiments are required to be conducted as compulsory experiments: Week 7. 7.To plot the characteristics of PN junction diode forward bias & reverse bias, calculate cut in voltage, static & dynamic resistance. Week 8. 8.To draw the input & output characteristics in a graph in common emitter configuration Week 9. 9.To calculate the ripple factor &percentage regulation of a half wave rectifier with and without filters Week 10. 10.To calculate the ripple factor &percentage regulation of a full wave rectifier with and without filters Week 11. 11.To calculate the gain and bandwidth for a common emitter amplifier Week 12. 12.To calculate the gain and bandwidth for a common field effect

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		amplifier
		List of Augmented experiments Section A: Electrical Engineering 13. To make scott connection on the given two 1-Ø transformer and verifying the voltage on the secondary side of the Scott connected transformer. 14. To verification of Parallel Operation of Two Identical 1-ØTransformers 15. To separate the hysteresis losses and eddy current losses of a 1-Ø transformer Section B: Electronics Engineering 16. To draw the V I characteristics of a P-N Junction Diode (Ge &Si). 17. To draw the V I characteristics of a Zener Diode. 18. To verify the operation of Zener Diode as a voltage regulator

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Regulation	Pre-Revision	Post-Revision
Course Title	Rock Mechanics and Ground Control	Fundamentals Of Rock Mechanics
Course Code	RT41263	171MI4T08
Syllabus	**UNIT - I** Historical Development: Definition, scope and development of the science of Rock Mechanics. Analysis of stress and strain in three dimensions, principal stress, stress ellipsoid and stress directors surface; Determine of principal stress stress invariants Determination of maximum shearing stress, Octahedral stresses Homogeneous deformation Strain at a point principal axes of strains Differential equations of equilibrium.Compatibility equation of stains Compatibility equation in terms of stress components, stress function.	**UNIT – I** : Historical Development: Definition, scope and development of the science of Rock Mechanics. Analysis of stress and strain in three dimensions, stress ellipsoid and stress directors surface; Determine of principal stress stress invariants Determination of maximum shearing stress, Octahedral stresses Homogeneous Deformation Strain at a point principal axes of strains Differential equations of equilibrium. Compatibility equation of stains Compatibility equation in terms of stress components, stress function
	UNIT – II Geo-Engineering Studies:- Under ground geo-technical mapping. Physico – mechanical properties and strength indices of rock and their determination: density, Tensile Compressive and shear strength young's modulus, Poissin's ratio Impact strength and protodya Konov's strength index, point load index, Rock quality designation (RQD); Slack durability index. Rock mass rating (RMR) Cavability index Brinnels hard ness and contact strengths.	**UNIT – II**: Geo-Engineering Studies: Physico – mechanical properties and strength indices of rock and their determination. Compressive, Tensile and shear strength, Young's modulus, Poisson's ratio, Protodyakonov's index, point load index. Slake durability index. Dynamic elastic properties.
	UNIT – III Rock Behavior: Confining pressures, effect of water, time temperature In-situ stresses and their estimation, Horizontal stress and vertical stress, Intact rock strength and defomability; measuring devices Load, stress, strain Dynamic loading of rocks. Photo – elastic experimental methods: Photo elastic stress measurement, circular Polariscope, Photo elastic stress determination, Determination of the principal stesses –	**UNIT – III**: Rock Behavior: Confining pressures, effect of water, time temperature In-situ stresses and their estimation, Horizontal stress and vertical stress, intact rock strength and deformability; measuring devices Load, stress, strain Dynamic loading of rocks

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	Moire method Engineering classification of rocks. Theories of failure of rock and their applications.	
	UNIT –IV Definition and concept of ground control in mines, ground control practices in mines. Constraints on ground control design, characterestics of coal measures strata. Pre mining stresses. Theories of mechanics of strata behavior	**UNIT –IV**: Rock stress: Stresses around mine openings of different cross sections
	UNIT – V Roof supports: timber and steel supports, friction and hydraulic prop arches, shorcret, roof truss, roof bolts, powered supports, stowing caving strip packing pump packing rock reinforcement. Design of structures and rock, design of underground openings, design of pillars, design of open pit slopes, waste dumps and embankments. Design of stopes.	**UNIT – V**: Rock mass failure theories: Theories of failure of rocks and their applications. Mohr's theory, Mohr-Coulomb failure criteria, Griffiths' theory, Different modes of failure of rocks.
	UNIT – VI Subsidence: theories of subsidence, factors affecting subsidence, prediction and measurement of subsidence. Damage and prevention of damage due to subsidence. Bumps and rock bursts – causes ,occurrence and control.	

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Regulation	Pre-Revision	Post-Revision
Course Title	Fluid Mechanics and Hydraulics machines lab	Mechanical Engineering Lab
Course Code	R1621264	R1631268
Syllabus	(A) Mechanics of solids lab: 1. Direct tension test 2. Bending test on a) Simply supported b) Cantilever beam 3. Torsion test 4. Hardness test a) Brinells hardness test b) Rockwell hardness test 5. Compression test on cubes 6. Impact test	THERMAL EXPERIMENTS 1.Study of I.C. engines and components 2. Performance test on 4 S diesel engine 3. Performance test on reciprocating air-compressor 4. Study of refrigeration system 5. Study of Boilers 6. Disassembly /Assembly of Engines.
	(B) Metallurgy Lab : 1. Preparation and study of the Micro Structure of pure metals like Iron, Cu and Al. 2. Preparation and study of the Microstructure of Mild steels, low carbon steels, high – C steels. 3. Study of the Micro Structures of Cast Irons. 4. Study of the Micro Structures of Non-Ferrous alloys. 5. Study of the Micro structures of Heat treated steels. 6. Hardenability of steels by Jominy End Quench Test. 7. To find out the hardness of various treated and untreated steels.	Engineering Design 1. Cam displacement and velocity analysis 2. Whirling of shaft-determination of critical speed of shaft with concentrated loads 3. Determination of moment of inertia by oscillation method for connecting rod and flywheel. 4. Vibrating system – spring mass system – determination of damping co-efficient of single degree of freedom system. 5. Transverse vibration – free – beam, determination of natural frequency and deflection of beam. 6. Study of Gears and linkage mechanisms

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Regulation	Pre-Revision	Post-Revision
Course Title	Mine Health and Safety Engineering	Mine Safety Engineering
Course Code	RT42264C	R163226C
Syllabus	**UNIT I** Mine accidents, types of accidents, roof fall accidents.	**UNIT I** MINE ACCIDENTS Accident in mines;- different types, accident investigations; accident analysis; accident prevention and corrective action, accident proneness, creating and maintaining safety awareness, ZAP and MAP, job safety analysis, safety meeting and committee.
	UNIT II Planning for safety, Safety analysis, Safety prevention and precautions.	**UNIT II** HEALTH AND MINE SAFETY Definition of health and safety, management's role – function; evolution of management involvement, management's training, responsibility, cost of health and safety, role of labour organizations – Union impact and involvement, role of government – statutory controls and directions, spot and regular inspections, enforcement of standards, penalties for violations, collection and distribution of statistical data.
	UNIT III Information system and safety audits.	**UNIT III** FAULT TREE ANALYSIS Introduction – methodology, symbols and Boolean techniques, qualitative analysis, computerized methods, statistical analysis, safety information, systems design
	UNIT IV Hazard control- engineering approach, systems approach, Hazard analysis	**UNIT IV** RISK ASSESSEMENT Principles, risk and hazard control, risk and hazard evaluation and data collection for identified health risks, exposure assessment and risk characterization, probabilistic risk analysis,
Syllabus	**UNIT V** Safety management, Economics of safety and cost- effectiveness.	**UNIT V** DISASTER MANAGEMENT Risk management, safety culture, human factors, reliability evaluation, safety audit. Identification of causes of mine disasters, preventive action, disaster management and mitigation, typical cases of mine disasters in India
	UNIT VI Occupational hygiene, occupational diseases, Occupational hazards in	**UNIT VI** MINER'S OCCUPATIONAL DISEASES AND ENQUIRY COMMITTEE Miner's occupational health and diseases, preventive

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	mines.	medical examinations, various types of injuries, compensable diseases, medical attention and removable of causative factors in the mines. Recommendations of inquiry committee carried out for safety and health issues in India.

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Department of M.Tech (Software Engineering)

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Software Project and Process Management	Software Project and Process Management
Course Code	162SO1T03	172SO1T03
Syllabus	**UNIT-I:** Basic Structure Of Computers: Functional unit, Basic Operational concepts, Bus structures, System Software, Performance, The history of computer development.	**UNIT-I:** Basic Structure of Computers: Computer Types, Functional Units, Basic Operational Concepts, Bus structures, Software, Performance, Historical Perspective. Machine Instruction and Programs: Instructions and Instruction Sequencing, Addressing Modes, Basic Input/output Operations, Stacks and Queues, Additional Instructions.Case Study: ARM, Motorola and Intel Instruction sets.
	UNIT-II: Machine Instruction and Programs: Instruction and Instruction Sequencing: Register Transfer Notation, Assembly Language Notation, Basic Instruction Types, Addressing Modes, Basic Input/output Operations, The role of Stacks and Queues in computer programming equation. Component of Instructions: Logic Instructions, shift and Rotate Instructions	**UNIT-II:** Arithmetic : Addition and Subtraction of Signed Numbers, Signed-Operand Multiplication, Floating-Point Numbers and Operations – IEEE Standard for Floating-Point Numbers, Arithmetic Operations on Floating-Point Numbers. Basic Processing Unit: Some Fundamental Concepts, Execution of a Complete Instruction, Multiple-Bus Organization, Hardwired Control, Micro programd Control -Microinstructions, Micro program Sequencing, Wide Branch Addressing, Microinstructionswith Next –Address
	UNIT-III: Type of Instructions: Arithmetic and Logic Instructions, Branch Instructions, Addressing Modes, Input/output Operations	**UNIT-III:** The Memory System: Some Basic Concepts, Read-Only Memories - ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size and Cost, Cache Memories - Mapping Functions, Replacement Algorithms, Performance considerations – Interleaving, Hit Rate and Miss Penalty, Virtual Memories, Memory Management Requirements, Secondary Storage
	UNIT-IV: INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices,	**UNIT-IV:** Input/Output Organization: Accessing I/O Devices, Interrupts -

	Interrupts: Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, Direct Memory Access, Buses: Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interface: Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB)	Interrupt Hardware, Enabling and Disabling Interrupts, Handling Multiple Devices, modes of transfer –Programd I/O, Interrupt initiated I/O & Direct Memory Access, Buses - Synchronous Bus, Asynchronous Bus, Interface Circuits, Standard I/O Interfaces - Peripheral Component Interconnect (PCI) Bus, Universal Serial Bus (USB).
	UNIT-V: The MEMORY SYSTEMS: Basic memory circuits, Memory System Consideration, ReadOnly Memory: ROM, PROM, EPROM, EEPROM, Flash Memory, Cache Memories: Mapping Functions, INTERLEAVING Secondary Storage: Magnetic Hard Disks, Optical Disks,	**UNIT-V:** Pipelining : Basic Concepts, Data Hazards, Instruction Hazards, Influence on Instruction Sets, Datapath and Control Considerations, Superscalar Operation.

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Department of Electrical and Electronics Engineering

(Power Electronics and Drives)

Syllabus revision Index for 2018-2019

S. No	Name of the course	Percentage of syllabus change
1	Reactive Power Compensation & Management	25
2	Electrical Distribution System	20
3	Smart Grid Technologies	20
4	Programmable Logic Controllers & Applications	20

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Dept: Of Electrical & Electronics Engineering
Aditya Engineering College (A9)

Department of Electrical and Electronics Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Reactive Power Compensation & Management**	**Reactive Power Compensation & Management**
Course Code	**172PD2E08**	**172PD2E08**
Syllabus	**UNIT-1: Load Compensation:** Objectives and specifications - reactive power characteristics - inductive and capacitive approximate biasing - Load compensator as a voltage regulator - phase balancing and power factor correction of unsymmetrical loads- examples.	**UNIT-i: Load Compensation:** Objectives and specifications - reactive power characteristics - inductive and capacitive approximate biasing - Load compensator as a voltage regulator - phase balancing and power factor correction of unsymmetrical loads- examples.
	UNIT-II: Reactive power compensation in transmission system: Steady state -Uncompensated line - types of compensation - Passive shunt and series and dynamic shunt compensation – examples Transient state - Characteristic time periods - passive shunt compensation - static compensations- series capacitor compensation -compensation using synchronous condensers - examples	**UNIT-II: Reactive power compensation in transmission system:** Steady state -Uncompensated line - types of compensation - Passive shunt and series and dynamic shunt compensation – examples Transient state - Characteristic time periods - passive shunt compensation - static compensations- series capacitor compensation -compensation using synchronous condensers - examples
	UNIT -III: Reactive power coordination: Objective - Mathematical modeling - Operation planning - transmission benefits - Basic concepts of quality of power supply - disturbances- steady - state variations - effects of under voltages - frequency - Harmonics, radio frequency and electromagnetic interferences	**UNIT -III: Reactive power coordination:** Objective - Mathematical modeling - Operation planning - transmission benefits - Basic concepts of quality of power supply - disturbances- steady - state variations - effects of under voltages - frequency - Harmonics, radio frequency and electromagnetic interferences
	UNIT -IV: Distribution side Reactive power Management: System losses -loss reduction methods	**UNIT -IV: Demand Side Management:** Load patterns – basic methods load

	- examples - Reactive power planning - objectives - Economics Planning capacitor placement - retrofitting of capacitor banks User side reactive power management: KVAR requirements for domestic appliances - Purpose of using capacitors - selection of capacitors - deciding factors - types of available capacitor, characteristics and Limitations	shaping – power tariffs- KVAR based tariffs penalties for voltage flickers and Harmonic voltage levels Distribution side Reactive power Management:: System losses –loss reduction methods – examples – Reactive power planning – objectives – Economics Planning capacitor placement – retrofitting of capacitor banks
	UNIT-V: **Reactive power management in electric traction systems and are furnaces:** Typical layout of traction systems - reactive power control requirements – distribution transformers- Electric arc furnaces - basic operations- furnaces transformer - filter requirements - remedial measures -power factor of an arc furnace	**UNIT-V: User Side Reactive Power Management:** KVAR requirements for domestic appliances – Purpose of using capacitors – selection of capacitors – deciding factors – types of available capacitor, characteristics and Limitations Reactive power management in electric traction systems and are furnaces: Typical layout of traction systems – reactive power control requirements – distribution transformers- Electric arc furnaces – basic operations- furnaces transformer – filter requirements – remedial measures –power factor of an arc furnace

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Electrical Distribution Systems**	**Electrical Distribution Systems**
Course Code	**172PD2E09**	**172PD2E09**
Syllabus	**UNIT- I: Load characteristics:** Residential, Commercial, Agricultural and Industrial and their characteristics.	**UNIT I: GENERAL CONCEPTS:** Introduction to distribution system, Distribution system planning, Factors effecting the distribution system planning, Load modeling and characteristics. Coincidence factor – Contribution factor – Loss factor – Relationship between the load factor and loss factor. Load growth, Classification of Loads (Residential, Commercial, Agricultural and Industrial) and their characteristics.
	UNIT -II: Distribution Feeders and Substations : Design consideration of Distribution feeders: Radial and loop types of primary feeders, voltage levels, feeder-loading. Design practice of the secondary distribution system. Location of Substations : Rating of a Distribution Substation, service area with 'n' primary feeders. Benefits derived through optimal location of substations.	**UNIT -II: Distribution Feeders and Substations :** Design consideration of Distribution feeders: Radial and loop types of primary feeders, voltage levels, feeder-loading. Design practice of the secondary distribution system. Location of Substations : Rating of a Distribution Substation, service area with 'n' primary feeders. Benefits derived through optimal location of substations.
	UNIT- III: System Analysis : Voltage drop and power loss calculations : Derivation for volt-drop and power loss in lines, manual methods of solution for radial networks, three-phase balanced primary lines, non-three-phase primary lines.	**UNIT- III: System Analysis :** Voltage drop and power loss calculations : Derivation for volt-drop and power loss in lines, manual methods of solution for radial networks, three-phase balanced primary lines, non-three-phase primary lines.
	UNIT -IV : Protective devices and	**UNIT -IV : Protective devices and**

	coordination : Objectives of distribution system protection, types of common faults and procedure for fault calculation. Protective Devices: Principle of operation of fuses, circuit reclosers, line sectionalizer and circuit breakers. Coordination of protective devices, General coordination procedure.	**coordination** : Objectives of distribution system protection, types of common faults and procedure for fault calculation. Protective Devices: Principle of operation of fuses, circuit reclosers, line sectionalizer and circuit breakers. Coordination of protective devices, General coordination procedure.
	UNIT - V : Capacitive compensation for power factor control: Different types of power capacitors, shunt and series capacitors, effect of shunt capacitors (Fixed and switched) power factor correction, capacitor location. Economic justification. Procedure to determine the best capacitor location. Voltage control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR, line drop compensation.	**UNIT - V : Capacitive compensation for power factor control:** Different types of power capacitors, shunt and series capacitors, effect of shunt capacitors (Fixed and switched) power factor correction, capacitor location. Economic justification. Procedure to determine the best capacitor location. Voltage control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR, line drop compensation.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Smart Grid Technologies	Smart Grid Technologies
Course Code	172PD2E10	172PD2E10
Syllabus	**UNIT- I: Introduction to Smart Grid:** Evolution of Electric Grid, Concept of Smart Grid, Definitions,Need of Smart Grid, Functions of Smart Grid, Opportunities & Barriers of Smart Grid, Difference between conventional & smart grid, Concept of Resilient &Self Healing Grid, Present development & International policies on Smart Grid. Case study of Smart Grid.	**UNIT I: Introduction to Smart Grid:** Basics of power systems, definition of smart grid, need for smart grid, smart grid domain, enablers of smart grid, smart grid priority areas, regulatory challenges, smart-grid activities in India.
	UNIT - II: Smart Grid Technologies: Part 1: Introduction to Smart Meters, Real Time Prizing, Smart Appliances, Automatic Meter Reading(AMR), Outage Management System(OMS), Plug in Hybrid Electric Vehicles(PHEV), Vehicle to Grid, Smart Sensors, Home & Building Automation, Phase Shifting Transformers.	**UNIT - II: Smart Grid Technologies: Part 1:** Introduction to Smart Meters, Real Time Prizing, Smart Appliances, Automatic Meter Reading(AMR), Outage Management System(OMS), Plug in Hybrid Electric Vehicles(PHEV), Vehicle to Grid, Smart Sensors, Home & Building Automation, Phase Shifting Transformers.
	UNIT - III: Smart Grid Technologies: Part 2: Smart Substations, Substation Automation, Feeder Automation. Geographic Information System(GIS), Intelligent Electronic Devices(IED) & their application for monitoring & protection, Smart storage like Battery, SMES, Pumped Hydro, Compressed Air Energy Storage, Wide Area	**UNIT - III: Smart Grid Technologies: Part 2:** Smart Substations, Substation Automation, Feeder Automation. Geographic Information System(GIS), Intelligent Electronic Devices(IED) & their application for monitoring & protection, Smart storage like Battery, SMES, Pumped Hydro, Compressed Air Energy Storage, Wide Area

	Measurement System(WAMS), Phase Measurement Unit(PMU).	Measurement System(WAMS), Phase Measurement Unit(PMU).
	UNIT - IV: Micro-grids and Distributed Energy Resources: Concept of micro grid, need & applications of Micro grid, formation of micro grid, Issues of interconnection, protection & control of micro grid. Plastic & Organic solar cells, Thin film solar cells, Variable speed wind generators, fuel cells, micro turbines, Captive power plants, Integration of renewable energy sources.	**UNIT - IV: Micro-grids and Distributed Energy Resources:** Concept of micro grid, need & applications of Micro grid, formation of micro grid, Issues of interconnection, protection & control of micro grid. Plastic & Organic solar cells, Thin film solar cells, Variable speed wind generators, fuel cells, micro turbines, Captive power plants, Integration of renewable energy sources.
	UNIT - V: Power Quality Management in Smart Grid: Power Quality & EMC in Smart Grid, Power Quality issues of Grid connected Renewable Energy Sources, Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring, Power Quality Audit. Information and Communication Technology for Smart Grid: Advanced Metering Infrastructure (AMI), Home Area Network (HAN), Neighborhood Area Network (NAN), Wide Area Network (WAN).	**UNIT - V: Power Quality Management in Smart Grid:** Power Quality & EMC in Smart Grid, Power Quality issues of Grid connected Renewable Energy Sources, Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring, Power Quality Audit. Information and Communication Technology for Smart Grid: Advanced Metering Infrastructure (AMI), Home Area Network (HAN), Neighborhood Area Network (NAN), Wide Area Network (WAN).

Course Coordinator

Head of the Department

Head of The Department
Dept. Of Electrical & Electronics Engineering
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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Programmable Logic Controllers & Applications**	**Programmable Logic Controllers & Applications**
Course Code	**172PD2E12**	**172PD2E12**
Syllabus	**UNIT - I: PLC Basics:** PLC system, I/O modules and interfacing, CPU processor, programming equipment, programming formats, construction of PLC ladder diagrams, devices connected to I/O modules	**UNIT - I: PLC Basics:** PLC system, I/O modules and interfacing, CPU processor, programming equipment, programming formats, construction of PLC ladder diagrams.
	UNIT - II: PLC Programming: Input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation. Digital logic gates, programming in the Boolean algebra system, conversion examples. Ladder diagrams for process control: Ladder diagrams and sequence listings, ladder diagram construction and flow chart for spray process system.	**UNIT - II: PLC Programming:** Input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation. Digital logic gates, programming in the Boolean algebra system, conversion examples. Ladder diagrams for process control: Ladder diagrams and sequence listings, ladder diagram construction.
	UNIT - III: PLC Registers: Characteristics of Registers, module addressing, holding registers, input registers, output registers. PLC Functions: Timer functions and Industrial applications, counters, counter function industrial applications, Arithmetic functions, Number comparison functions, number conversion functions.	**UNIT - III: PLC Registers:** Characteristics of Registers, module addressing, holding registers, input registers, output registers. PLC Functions: Timer functions and Industrial applications, counters, counter function industrial applications, Arithmetic functions.
	UNIT - IV: Data Handling functions: SKIP, Master control Relay, Jump, Move, FIFO, FAL, ONS, CLR and Sweep functions and	**UNIT - IV: Data Handling functions:** SKIP, Master control Relay, Jump, Move, FIFO, FAL, ONS, CLR and Sweep functions and their applications.

	their applications. Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axis and three axis Robots with PLC, Matrix functions	Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axis and three axis Robots with PLC.
	UNIT - V: Analog PLC operation: Analog modules and systems, Analog signal processing, multi bit data processing, analog output application examples, PID principles, position indicator with PID control., PID modules, PID tuning, PID functions	**UNIT - V: Analog PLC operation:** Analog modules and systems, Analog signal processing, multi bit data processing, analog output application examples, PID principles, position indicator with PID control.

Course Coordinator

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Department of Mechanical Engineering

M.Tech-Thermal Engineering

Syllabus revision Index (2018-19)

S. No	Name of the course	Percentage of syllabus change
1	Advanced Automobile Engineering	20
2	Equipment design for Thermal Systems	20

Program Coordinator

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SURAMPALEM-533 437

Department of Mechanical Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Advanced Automobile Engineering**	**Advanced Automobile Engineering**
Course Code	**172TE2E12**	**172TE2E12**
Syllabus	**UNIT I:** **Transmission Systems:** Clutch, gearbox, propeller shaft, differential, axle and wheels	**UNIT I:** **Transmission Systems:** Clutch, gearbox, propeller shaft, differential, axle and wheels
	UNIT II: **Breaking Systems:** Mechanical, hydraulic & pneumatic breaking systems. Antilock breaking systems. Safety and Security	**UNIT II:** **Breaking Systems:** Mechanical, hydraulic & pneumatic breaking systems. Antilock breaking systems. Safety and Security
	UNIT III: **Steering & Suspension Systems:** Mechanical and power steering. Mechanical, electronic and adaptive suspension systems	**UNIT III:** **Steering & Suspension Systems:** Mechanical and power steering. Mechanical, electronic and adaptive suspension systems
	UNIT IV: **Electrical & Electronic Systems:** Wiring circuits, Trouble diagnosis & Trouble shooting, charging, starting and lighting system.	**UNIT IV:** **Propeller shaft and Braking system Design and Calculation of CG of the vehicle** Propeller shaft; Design of Propeller shafts for a give torque rating; types of drive shafts; Mechanics of Hotchkiss drive and Torque tube drive; Numerical- Braking of vehicles; Brakes applied to the rear wheels & front wheels; Calculation of mean lining pressure and heat generation during braking; braking of vehicle in a curved path; Numerical- Importance of CG – Calculating CG location in Lateral, Side, and its height
	UNIT V: **Hybrid Vehicles & Motor Vehicle Act:** Components of hybrid vehicles, Motor vehicle act.	**UNIT V:** **Electrical & Electronic Systems:** Wiring circuits, Trouble diagnosis & Trouble shooting, charging, starting and lighting system. **Hybrid Vehicles & Motor Vehicle Act:** Components of hybrid vehicles, Motor vehicle act.

Course Coordinator

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Surampalem

Department of Mechanical Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Equipment Design for Thermal Systems	Equipment Design for Thermal Systems
Course Code	172TE2E16	172TE2E16
Syllabus	**UNIT-I:** **Classification of Heat Exchangers**: Introduction, Recuperation & regeneration, Tabular heat exchangers, Double pipe, shell & tube heat exchanger, Plate heat Exchangers, Gasketed plate heat exchanger. Spiral plate heat exchanger, Lamella heat exchanger, Extended surface heat exchanger, Plate fin and Tabular fin. **Basic Design Methods of Heat Exchanger**: Introduction, Basic equations in design, Overall heat transfer coefficient, LMTD method for heat exchanger analysis, Parallel flow, Counter flow. Multipass, cross flow heat exchanger design calculations:	**UNIT-I:** **Classification of Heat Exchangers**: Introduction, Recuperation & regeneration, Tabular heat exchangers, Double pipe, shell & tube heat exchanger, Plate heat Exchangers, Gasketed plate heat exchanger. Spiral plate heat exchanger, Lamella heat exchanger, Extended surface heat exchanger, Plate fin and Tabular fin. **Basic Design Methods of Heat Exchanger**: Introduction, Basic equations in design, Overall heat transfer coefficient, LMTD method for heat exchanger analysis, Parallel flow, Counter flow. Multipass, cross flow heat exchanger design calculations:
	UNIT-II: **Double Pipe Heat Exchanger**: Film coefficient for fluids in annulus, fouling factors, Calorific temperature, Average fluid temperature, The calculation of double pipe exchanger, Double pipe exchangers in series parallel arrangements. Shell & Tube Heat Exchangers: Tube layouts for exchangers, Baffle heat exchangers, Calculation of shell and tube heat exchangers, Shell side film coefficients, Shell side equivalent diameter, The true temperature difference in a 1-2 heat exchanger. Influence of approach temperature on correction factor. Shell side pressure drop, Tube side pressure drop, Analysis of	**UNIT-II:** **Double Pipe Heat Exchanger**: Film coefficient for fluids in annulus, fouling factors, Calorific temperature, Average fluid temperature, The calculation of double pipe exchanger, Double pipe exchangers in series parallel arrangements. Shell & Tube Heat Exchangers: Tube layouts for exchangers, Baffle heat exchangers, Calculation of shell and tube heat exchangers, Shell side film coefficients, Shell side equivalent diameter, The true temperature difference in a 1-2 heat exchanger. Influence of approach temperature on correction factor. Shell side pressure drop, Tube side pressure drop, Analysis of

	performance of 1-2 heat exchanger and design of shell & tube heat exchangers, Flow arrangements for increased heat recovery, the calculation of 2-4 exchangers.	performance of 1-2 heat exchanger and design of shell & tube heat exchangers, Flow arrangements for increased heat recovery, the calculation of 2-4 exchangers.
	UNIT-III **Condensation of Single Vapours**: Calculation of horizontal condenser, Vertical condenser, De-Super heater condenser, Vertical condenser-sub-Cooler, Horizontal Condenser-Sub cooler, Vertical reflux type condenser. Condensation of steam.	**UNIT-III** **Condensation of Single Vapours**: Calculation of horizontal condenser, Vertical condenser, De-Super heater condenser, Vertical condenser-sub-Cooler, Horizontal Condenser-Sub cooler, Vertical reflux type condenser. Condensation of steam.
	UNIT-IV: **Vaporizers, Evaporators And Reboilers**: Vaporizing processes, Forced circulation vaporizing exchanger, Natural circulation vaporizing exchangers, Calculations of a reboiler. Extended Surfaces: Longitudinal fins. Weighted fin efficiency curve, Calculation of a Double pipe fin efficiency curve. Calculation of a double pipe finned exchanger, Calculation of a longitudinal fin shell and tube exchanger.	**UNIT-IV:** **Vaporizers, Evaporators And Reboilers**: Vaporizing processes, Forced circulation vaporizing exchanger, Natural circulation vaporizing exchangers, Calculations of a reboiler. Extended Surfaces: Longitudinal fins. Weighted fin efficiency curve, Calculation of a Double pipe fin efficiency curve. Calculation of a double pipe finned exchanger, Calculation of a longitudinal fin shell and tube exchanger. **Direct Contact Heat Exchanger**: Cooling towers, relation between wet bulb & dew point temperatures, The Lewis number and Classification of cooling towers, Cooling tower internals and the roll of fill, Heat Balance. Heat Transfer by simultaneous diffusion and convection Deign of cooling towers, Calculation of cooling tower performance.

	Unit-V: **Direct Contact Heat Exchanger**: Cooling towers, relation between wet bulb & dew point temperatures, The Lewis number and Classification of cooling towers, Cooling tower internals and the roll of fill, Heat Balance. Heat Transfer by simultaneous diffusion and convection, Analysis of cooling tower requirements, Deign of cooling towers, Determination of the number of diffusion units, Calculation of cooling tower performance.	UNIT-V **Simulation and optimization of thermal systems:** Numerical modeling of thermal equipment-pumps, turbines and heat exchangers, simulation methods, optimization techniques- linear programming, geometric programming. Dynamic behavior of one-dimensional steady state thermal systems

Course Coordinator

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Department of Electronics and communication Engineering

Syllabus revision Index (V.L.S.I.D.)

2018-19

S.No	Name of the course	Percentage of syllabus change
1	Cyber security	20
2	CPLD/FPGA architecture and applications	25
3	CAD for VLSI	20

Head of the department

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Department of Electronics and communication Engineering

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Cyber security	Cyber security
Course Code	172EM1E01	172EM1E01
syllabus	UNIT-I Introduction: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks	UNIT-I Introduction: Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks
	UNIT-II Conventional Encryption: Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC	UNIT-II **Classical Encryption Techniques :** Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines , Steganography **Block Ciphers and the Data Encryption Standard:** Traditional Block Cipher Structure , The Data Encryption Standard, A DES Example, The Strength of DES
	UNIT-III Number Theory: Prime and Relatively Prime Numbers, Modular Arithmetic, Fermat's and Euler's Theorems, The Chinese Remainder theorem, Discrete logarithms Public key: Public key cryptography principles, public key cryptography algorithms, digital	UNIT-III Number Theory: Prime and Relatively Prime Numbers, Modular Arithmetic, Fermat's and Euler's Theorems, The Chinese Remainder theorem, Discrete logarithms Public key: Public key cryptography principles, public key cryptography algorithms, digital signatures, digital

	signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service	Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service
	UNIT-IV IP Security: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management Transport Level Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET) Email Privacy: Pretty Good Privacy (PGP) and S/MIME	UNIT-IV IP Security: IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management Transport Level Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET) Email Privacy: Pretty Good Privacy (PGP) and S/MIME
	UNIT-V Intrusion Detection: Intruders, Intrusion Detection systems, Password Management. Malicious Software: Viruses and related threats & Countermeasures. Fire walls: Firewall Design principles, Trusted Systems.	UNIT-V Intrusion Detection: Intruders, Intrusion Detection systems, Password Management. Malicious Software: Viruses and related threats & Countermeasures. Fire walls: Firewall Design principles, Trusted Systems. Introduction to Malware: What is Malware? Malware Family, History and Evolution of Malware, Malware Distribution Technique, How much damages malwares cause, How to defend Malware Infection

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	CPLD/FPGA architecture and applications	CPLD/FPGA architecture and applications
Course Code	172EM2T08	172EM2T08
Syllabus	UNIT-I Introduction to Programmable Logic Devices: Introduction, Simple Programmable Logic Devices - Read Only Memories, Programmable Logic Arrays, Programmable Array Logic, Programmable Logic Devices/Generic Array Logic; Complex Programmable Logic Devices – Architecture of Xilinx Cool Runner XCR3064XL,CPLD, CPLD Implementation of a Parallel Adder with Accumulation.	UNIT-I Introduction to Programmable Logic Devices: Introduction, Simple Programmable Logic Devices - Read Only Memories, Programmable Logic Arrays, Programmable Array Logic, Programmable Logic Devices/Generic Array Logic; Complex Programmable Logic Devices – Architecture of Xilinx Cool Runner XCR3064XL,CPLD, CPLD Implementation of a Parallel Adder with Accumulation.
	UNIT-II Field Programmable Gate Arrays: Organization of FPGAs, FPGA Programming Technologies, Programmable Logic Block Architectures, Programmable Interconnects, Programmable I/O blocks in FPGAs, Dedicated Specialized Components of FPGAs, Applications of FPGAs.	UNIT-II Field Programmable Gate Arrays: Organization of FPGAs, FPGA Programming Technologies, Programmable Logic Block Architectures, Programmable Interconnects, Programmable I/O blocks in FPGAs, Dedicated Specialized Components of FPGAs, Applications of FPGAs.
	UNIT–III Programming FPGAs: SRAM Programmable FPGAs, Introduction, Programming Technology, Device Architecture, The Xilinx XC2000, XC3000 and XC4000 Architectures.	UNIT–III Programming FPGAs: SRAM Programmable FPGAs, Introduction, Programming Technology, Device Architecture, The Xilinx XC2000, XC3000 and XC4000 Architectures.

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	UNIT-IV ACT FPGA Architectures: Anti-Fuse Programmed FPGAs, Introduction, Programming Technology, Device Architecture, TheActel ACT1, ACT2 and ACT3 Architectures	UNIT-IV ACT FPGA Architectures: Anti-Fuse Programmed FPGAs, Introduction, Programming Technology, Device Architecture, TheActel ACT1, ACT2 and ACT3 Architectures
	UNIT-V Applications: Design Applications, General Design Issues, Counter Examples, A Fast Video Controller, A Position Tracker for a Robot Manipulator, A Fast DMA Controller, Designing Counters with ACT devices, Designing Adders and Accumulators with the ACT Architecture.	UNIT-V Applications: Design Applications Designing with ACT! and ACT2 FPGAs, Designing with ACT FPGAs: A 1TL Perspective, Migrating PLD Designs to FPGAs, Synthesis Design Flow, Designing Counters with ACT Devices, Designing Adders and Accumulators with the ACT Architecture, State Machine Design, Using FPGAs for Digital PLLs.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	CAD for VLSI	CAD for VLSI
Course Code	172VD2E04	172VD2E04
Syllabus	UNIT-I VLSI Physical Design Automation: VLSI Design Cycle, New Trends in VLSI Design Cycle, Physical Design Cycle, New Trends in Physical Design Cycle, Design Styles, System Packaging Styles;	UNIT-I VLSI Physical Design Automation: VLSI Design Cycle, New Trends in VLSI Design Cycle, Physical Design Cycle, New Trends in Physical Design Cycle, Design Styles, System Packaging Styles;
	UNIT-II Partitioning, Floor Planning, Pin Assignment and Placement: Partitioning – Problem formulation, Classification of Partitioning algorithms, Kernighan-Lin Algorithm, Simulated Annealing, Floor Planning – Problem formulation, Classification of floor planning algorithms, constraint based floor planning, Rectangular Dualization, Pin Assignment – problem formulation, Classification of pin assignment algorithms, General and channel Pin assignments, Placement – Problem formulation, Classification of placement algorithms, Partitioning based placement algorithms	UNIT-II Partitioning, Floor Planning, Pin Assignment and Placement: Partitioning – Problem formulation, Classification of Partitioning algorithms, Kernighan-Lin Algorithm, Simulated Annealing, Floor Planning – Problem formulation, Classification of floor planning algorithms, constraint based floor planning, Rectangular Dualization, Pin Assignment –problem formulation, Classification of pin assignment algorithms, General and channel Pin assignments, Placement – Problem formulation, Classification of placement algorithms, Partitioning based placement algorithms
	UNIT-III Global Routing and Detailed Routing: Global Routing – Problem formulation, Classification of global routing algorithms, Maze routing algorithms, Detailed Routing – Problem formulation, Classification of routing algorithms, Single layer routing algorithms;	UNIT-III Global Routing and Detailed Routing: Global Routing – Problem formulation, Classification of global routing algorithms, Maze routing algorithms, Detailed Routing – Problem formulation, Classification of routing algorithms, Single layer routing algorithms;

	UNIT-IV Physical Design Automation of FPGAs and MCMs: FPGA Technologies, Physical Design cycle for FPGAs, Partitioning, Routing – Routing Algorithm for the Non-Segmented model, Routing Algorithms for the Segmented Model; Introduction to MCM Technologies, MCM Physical Design Cycle.	UNIT-IV Clock and Power Routing Clock Routing, Clocking Schemes, Design Considerations for the Clocking System, Delay Calculation for Clock Trees, Clock Routing Algorithms, H-tree Based Algorithm, The MMM Algorithm, Geometric Matching based Algorithm, Weighted Center Algorithm, Exact Zero Skew Algorithm, DME Algorithm, Power and Ground Routing
	UNIT-V Chip Input and Output Circuits: ESD Protection, Input Circuits, Output Circuits and noise, On-chip clock Generation and Distribution, Latch-up and its prevention.	UNIT-V Physical Design Automation of FPGAs and MCMs: FPGA Technologies, Physical Design cycle for FPGAs, Partitioning, Routing – Routing Algorithm for the Non-Segmented model, Routing Algorithms for the Segmented Model; Introduction to MCM Technologies, MCM Physical Design Cycle.

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Department of Electronics and communication Engineering

Syllabus revision Index (E.S.)

2018-19

S.No	Name of the course	Percentage of syllabus change
1	Sensorsandactuators	20
2	Devicedrivers	20

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Sensors and actuators	Sensors and actuators
Course Code	172EM1E02	172EM1E02
Syllabus	**UNIT-I:** **Sensors / Transducers:** Principles – Classification – Parameters – Characteristics - Environmental Parameters (EP) – Characterization. **Mechanical and Electromechanical Sensors:** Introduction – Resistive Potentiometer – Strain Gauge – Resistance Strain Gauge – Semiconductor Strain Gauges - Inductive Sensors: Sensitivity and Linearity of the Sensor –Types- Capacitive Sensors:– Electrostatic Transducer– Force/Stress Sensors Using Quartz Resonators – Ultrasonic Sensor	**UNIT-I** **Sensors / Transducers:** Principles, Classification, Parameters, Characteristics, Environmental Parameters (EP), Characterization, Mechanical and Electromechanical Sensors, Introduction, Resistive Potentiometer, Strain Gauge, Resistance Strain Gauge, Semiconductor Strain Gauges, Inductive Sensors, Sensitivity and Linearity of the Sensor, Types, Capacitive Sensors, Electrostatic Transducer,
	UNIT-II: **Thermal Sensors:** Introduction – Gas thermometric Sensors – Thermal Expansion Type Thermometric Sensors – Acoustic Temperature Sensor – Dielectric Constant and Refractive Index thermosensors – Helium Low Temperature Thermometer – Nuclear Thermometer – Magnetic Thermometer – Resistance Change Type Thermometric Sensors – Thermoemf Sensors– Junction Semiconductor Types– Thermal Radiation Sensors – Quartz Crystal	**UNIT-II** **Thermal Sensors:** Introduction, Gas thermometric Sensors, Thermal Expansion Type Thermometric Sensors, Acoustic Temperature Sensor, Dielectric Constant and Refractive Index thermo sensors, Helium Low Temperature Thermometer, Nuclear Thermometer, Magnetic Thermometer, Resistance Change Type Thermometric Sensors, Thermo emf Sensors, Junction Semiconductor Types, Thermal Radiation Sensors, **Magnetic sensors:** Introduction, Sensors and the Principles Behind, Magneto, resistive Sensors,

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	Thermoelectric Sensors – NQR Thermometry – Spectroscopic Thermometry – Noise Thermometry – Heat Flux Sensors **Magnetic sensors:** Introduction – Sensors and the Principles Behind – Magneto-resistive Sensors – Anisotropic Magnetoresistive Sensing – Semiconductor Magnetoresistors– Hall Effect and Sensors – Inductance and Eddy Current Sensors– Angular/Rotary Movement Transducers – Synchros – Synchro-resolvers - Eddy Current Sensors – Electromagnetic Flowmeter – Switching Magnetic Sensors SQUID Sensors	Anisotropic Magneto resistive Sensing, Semiconductor Magneto resistors, Hall Effect and Sensors, Inductance and Eddy Current Sensors, Angular/Rotary Movement Transducers, Switching Magnetic Sensors SQUID Sensors.
	UNIT-III: **Radiation Sensors:** Introduction – Basic Characteristics – Types of Photosensistors/Photo detectors– X-ray and Nuclear Radiation Sensors– Fiber Optic Sensors. **Electro analytical Sensors:** Introduction – The Electrochemical Cell – The Cell Potential - Standard Hydrogen Electrode (SHE) – Liquid Junction and Other Potentials – Polarization – Concentration Polarization– Reference Electrodes - Sensor Electrodes – Electro ceramics in Gas Media	**UNIT-III** **Position, distance, direction and motion sensors:** position sensing, direction sensing, distance measurement- large scale, distance travelled, accelerometer systems, rotation measurement
	UNIT - IV: **Smart Sensors:** Introduction – Primary Sensors – Excitation – Amplification – Filters – Converters – Compensation– Information Coding/Processing - Data Communication – Standards for Smart Sensor Interface – The Automation **Sensors-Applications:** Introduction – On-board Automobile Sensors (Automotive Sensors)– Home Appliance Sensors – Aerospace	**UNIT-IV** **Smart Sensors:** Introduction, Primary Sensors, Excitation, Amplification, Filters, Converters, Compensation, Information Coding/Processing, Data Communication, Standards for Smart Sensor Interface, the Automation Sensors. **Applications:** Introduction, On, board Automobile Sensors (Automotive Sensors), Home Appliance Sensors, Aerospace Sensors,,

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	Sensors — Sensors for Manufacturing –Sensors for environmental Monitoring	Sensors for Manufacturing, Sensors for environmental Monitoring.
	UNIT-V: Actuators Pneumatic and Hydraulic Actuation Systems- Actuation systems – Pneumatic and hydraulic systems - Directional Control valves – Presure control valves – Cylinders - Servo and proportional control valves – Process control valves – Rotary actuators Mechanical Actuation Systems- Types of motion – Kinematic chains – Cams – Gears – Ratchet and pawl – Belt and chain drives – Bearings – Mechanical aspects of motor selection Electrical Actuation Systems-Electrical systems -Mechanical switches – Solid-state switches Solenoids – D.C. Motors – A.C. motors – Stepper motors	**UNIT-V** **Actuators** Pneumatic and Hydraulic Actuation Systems: Actuation systems, Pneumatic and hydraulic systems, Directional Control valves, Pressure control valves, Cylinders, Servo and proportional control valves, Mechanical aspects of motor selection Electrical Actuation Systems, Electrical systems, Mechanical switches, Solid, state switches Solenoids, D.C. Motors, A.C. motors, Stepper motors

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	**Device Drivers**	**Device Drivers**
Course Code	172EM2E10	172EM2E10
syllabus	**UNIT-I** **An Introduction to Device Drivers:** The Role of the Device Driver, Splitting the Kernel, Classes of Devices and Modules, Security Issues. **Building and Running Modules:** Setting Up Your Test System, The Hello World Module, Kernel Modules Versus Applications, Compiling and Loading, The Kernel Symbol Table, Preliminaries, Initialization and Shutdown, Module Parameters, Doing It in User Space. **Char Drivers:** The Design of scull, Major and Minor Numbers, Some Important Data Structures, Char Device Registration, open and release, scull's Memory Usage, read and write, Playing with the New Devices.	**UNIT-I** **An Introduction to Device Drivers:** The Role of the Device Driver, Splitting the Kernel, Classes of Devices and Modules, Security Issues. **Building and Running Modules:** Setting Up Your Test System, The Hello World Module, Kernel Modules Versus Applications, Compiling and Loading, The Kernel Symbol Table, Preliminaries, Initialization and Shutdown, Module Parameters, Doing It in User Space. **Char Drivers:** The Design of scull, Major and Minor Numbers, Some Important Data Structures, Char Device Registration, open and release.
	UNIT-II **Debugging Techniques:** Debugging Support in the Kernel, Debugging by Printing, Debugging by Querying, Debugging by Watching, Debugging System Faults, Debuggers and Related Tools. **Concurrency and Race Conditions:** Pitfalls in scull, Concurrency and Its Management, Semaphores and Mutexes, Completions, Spinlocks, Locking Traps, Alternatives to Locking. **Advanced Char Driver Operations:** ioctl, Blocking I/O, poll and select, Asynchronous Notification, Seeking a	**UNIT-II** **Debugging Techniques:** Debugging Support in the Kernel, Debugging by Printing, Debugging by Querying, Debugging by Watching, Debugging System Faults, Debuggers and Related Tools. **Concurrency and Race Conditions:** Pitfalls in scull, Concurrency and Its Management, Semaphores and Mutexes, Completions, Spinlocks, Locking Traps, Alternatives to Locking. **Advanced Char Driver Operations:** ioctl, Blocking I/O, poll and select, Asynchronous Notification, Seeking a Device, Access Control on a Device

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	Device, Access Control on a Device File.	File.
	UNIT–III **Time, Delays, and Deferred Work:** Measuring Time Lapses, Knowing the Current Time, Delaying Execution, Kernel Timers, Tasklets, Workqueues. **Allocating Memory:** The Real Story of kmalloc, Lookaside Caches, get_free_page and Friends, vmalloc and Friends, Per-CPU Variables, Obtaining Large Buffers. **Communicating with Hardware:** I/O Ports and I/O Memory, Using I/O Ports, An I/O Port Example, Using I/O Memory. **Interrupt Handling:** Preparing the Parallel Port, Installing an Interrupt Handler, Implementing a Handler, Top and Bottom Halves, Interrupt Sharing, Interrupt-Driven I/O	**UNIT–III** **Time, Delays, and Deferred Work:** Measuring Time Lapses, Knowing the Current Time, Delaying Execution, Kernel Timers, Tasklets, Workqueues. **Allocating Memory:** The Real Story of kmalloc, Lookaside Caches, get_free_page and Friends, vmalloc and Friends, Per-CPU Variables, Obtaining Large Buffers.
	UNIT-IV **The Linux Device Model:** Kobjects, Ksets and Subsystems, Low-Level Sysfs Operations, Hotplug Event Generation, Buses, Devices, and Drivers, Classes, Putting It All Together, Hotplug, Dealing with Firmware. **Memory Mapping and DMA:** Memory Management in Linux, The mmap Device Operation, Performing Direct I/O, Direct Memory Access. **USB Drivers:** USB Device Basics, USB and Sysfs, USB Urbs, Writing a USB Driver, USB Transfers Without Urbs.	**Unit-IV** **Communicating with Hardware:** I/O Ports and I/O Memory, Using I/O Ports, An I/O Port Example, Using I/O Memory. **Interrupt Handling:** Preparing the Parallel Port, Installing an Interrupt Handler, Implementing a Handler, Top and Bottom Halves, Interrupt Sharing, Interrupt-Driven I/O
	UNIT-V **Block Drivers:** Registration, The Block Device Operations, Request Processing. **Network Drivers:** How snull Is Designed, Connecting to the Kernel, The net device Structure in Detail, Opening and Closing, Packet Transmission, Packet Reception, The Interrupt Handler, Receive Interrupt Mitigation, Changes in Link State, The Socket Buffers, MAC Address	**UNIT-V** **The Linux Device Model:** Kobjects, Ksets and Subsystems, Low-Level Sysfs Operations, Hotplug Event Generation, Buses, Devices, and Drivers, Classes, Putting It All Together, Hotplug, Dealing with Firmware. **Memory Mapping and DMA:** Memory Management in Linux, The mmap Device Operation, Performing Direct I/O, Direct Memory Access.

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	Resolution, Custom ioctl Commands, Statistical Information, Multicast. **TTY Drivers:** A Small TTY Driver, tty_driver Function Pointers, TTY Line Settings, ioctls,,proc and sysfs Handling of TTY Devices, The tty_driver Structure in Detail, The tty_operations Structure in Detail, The tty_struct Structure in Detail	**USB Drivers:** USB Device Basics, USB and Sysfs, USB Urbs, Writing a USB Driver, USB Transfers Without Urbs.

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Department of Computer Science and Engineering

Syllabus revision Index 2018-2019

S.No	Name of the course	Percentage of syllabus change
1	Advanced Operating Systems	20%
2	Digital Image Processing	20%

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Advanced Operating Systems	Advanced Operating Systems
Course Code	172CO1E02	172CO1E02
Syllabus	**UNIT-I:** Architectures of Distributed Systems System Architecture types - issues in distributed operating systems - communication networks - communication primitives. Theoretical Foundations - inherent limitations of a distributed system - lamp ports logical clocks - vector clocks - casual ordering of messages global state - termination detection.	**UNIT-I:** Architectures of Distributed Systems System Architecture types - issues in distributed operating systems - communication networks - communication primitives. Theoretical Foundations - inherent limitations of a distributed system - lamp ports logical clocks - vector clocks - casual ordering of messages global state - termination detection. Distributed Mutual Exclusion - introduction - the classification of mutual exclusion and associated algorithms.
	UNIT-II: Distributed Deadlock Detection – Strategies and Protocols Deadlock handling strategies in distributed systems - issues in deadlock detection and resolution - control organizations for distributed deadlock detection - centralized and distributed deadlock detection algorithms -hierarchical deadlock detection algorithms. Agreement protocols - introduction-the system mode, A classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms.	**UNIT-II:** Distributed Deadlock Detection – Strategies and Protocols Deadlock handling strategies in distributed systems - issues in deadlock detection and resolution - control organizations for distributed deadlock detection - centralized and distributed deadlock detection algorithms - hierarchical deadlock detection algorithms. Agreement protocols - introduction-the system mode, A classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms. Distributed resource management: introduction-architecture -

		mechanism for building distributed file systems - design issues.
	UNIT-III: **Distributed Shared Memory**-Concepts Algorithms for implementing DSM - memory coherence and protocols - design issues. Distributed Scheduling - introduction - issues in load distributing - components of a load distributing algorithm - stability - load distributing algorithm - performance comparison - selecting a suitable load sharing algorithm - requirements for load distributing -task migration and associated issues.	**UNIT-III:** **Distributed Shared Memory**-Concepts Algorithms for implementing DSM - memory coherence and protocols - design issues. Distributed Scheduling - introduction - issues in load distributing - components of a load distributing algorithm - stability - load distributing algorithm - performance comparison - selecting a suitable load sharing algorithm - requirements for load distributing -task migration and associated issues. Failure Recovery and Fault tolerance: introduction- basic concepts - classification of failures - backward and forward error recovery, backward error recovery- recovery in concurrent systems - consistent set of check points - synchronous and asynchronous check pointing and recovery.
	UNIT-IV: **Protection and Security** – Preliminaries Access matrix model and its implementations. Safety in matrix model- advanced models of protection. Data security - cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard-public key cryptography	**UNIT-IV:** **Protection and Security** –Preliminaries Access matrix model and its implementations. Safety in matrix model- advanced models of protection. Data security - cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard-public key cryptography - multiple encryption - authentication in distributed systems
	UNIT-V: **Multiprocessor Operating** Systems - basic multiprocessor system architectures - inter connection networks for multiprocessor systems -	**UNIT-V:** **Multiprocessor Operating** Systems - basic multiprocessor system architectures - inter connection networks for multiprocessor systems - caching -

	caching - hypercube architecture..	hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads- process synchronization and scheduling.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Digital Image Processing	Digital Image Processing
Course Code	172CO2E06	172CO2E06
Syllabus	**UNIT-I:** **Introduction:** Applications of Computer Graphics and Image Processing, Fundamentals on Pixel concepts, effect of Aliasing and Jaggles, Advantages of high resolution systems.	**UNIT-I:** **Introduction:** Applications of Computer Graphics and Image Processing, Fundamentals on Pixel concepts, effect of Aliasing and Jaggles, Advantages of high resolution systems. **DDA line algorithms:** Bresenhams line and circle derivations and algorithms.
	UNIT-II: **2-D Transformations:** Translations, Scaling, rotation, reflection and shear transformations, Homogeneous coordinates, **Composite Transformations-** Reflection about an arbitrary line; Windowing and clipping, viewing transformations, Cohen- Sutherland clipping algorithm.	**UNIT-II:** **2-D Transformations:** Translations, Scaling, rotation, reflection and shear transformations, Homogeneous coordinates, **Composite Transformations-** Reflection about an arbitrary line; Windowing and clipping, viewing transformations, Cohen- Sutherland clipping algorithm.
	UNIT-III: **Digital Image Properties:** Metric and topological properties of Digital Images, Histogram, entropy, Visual Perception, Image Quality, Color perceived by humans, Color Spaces, Palette Images, color Constancy. **Color Images:** Pixel brightness transformations, Local Preprocessing, image smoothing, Edge detectors, Robert Operators, Laplace, Prewitt, Sobel,	**UNIT-III:** **Digital Image Properties:** Metric and topological properties of Digital Images, Histogram, entropy, Visual Perception, Image Quality, Color perceived by humans, Color Spaces, Palette Images, color Constancy. **Color Images:** Pixel brightness transformations, Local Preprocessing, image smoothing, Edge detectors, Robert Operators, Laplace, Prewitt, Sobel, Fri-chen, Canny Edge detection.

	Fri-chen, Canny Edge detection.	
	UNIT-IV: **Mathematical Morphology:** Basic Mathematical Concepts, Binary dilation and Erosion, Opening and closing, Gray Scale dilation and erosion, Skeleton, Thinning, Thickening Ultimate erosion.	**UNIT-IV:** **Mathematical Morphology:** Basic Mathematical Concepts, Binary dilation and Erosion, Opening and closing, Gray Scale dilation and erosion, Skeleton, Thinning, Thickening Ultimate erosion, Geodesic transformations, Morphology and reconstruction, Morphological Segmentation.
	UNIT-V: **SEGMENTATION:** Threshold detection methods, Optimal Thresholding, Edge based Segmentation-Edge image thresholding, Edge relaxation, Border tracing, Hough Transforms, Region based segmentation: Region Merging Region Splitting, Splitting and Merging, Watershed Segmentation. **Image Data Compression:** Image data Properties, Discrete Image Transformations in data compression, Discrete Cosine and Wavelet Transforms, Types of DWT and merits.	**UNIT-V:** **SEGMENTATION:** Threshold detection methods, Optimal Thresholding, Edge based Segmentation-Edge image thresholding, Edge relaxation, Border tracing, Hough Transforms, Region based segmentation: Region Merging Region Splitting, Splitting and Merging, Watershed Segmentation. **Image Data Compression:** Image data Properties, Discrete Image Transformations in data compression, Discrete Cosine and Wavelet Transforms, Types of DWT and merits; Predicative Compression methods, Hierarchical and Progressive Compression methods, Comparison of Compression methods, JPEG- MPEG Image Compression methods.

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Department of Petroleum Technology

Syllabus revision Index for 2018-2019

S.No	Name of the course	Percentage of syllabus change
1	Flow Assurance	20
2	Characterization Of Petroleum Oils	20

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Department of Petroleum Technology

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Flow Assurance	Flow Assurance
Course Code	172PE2E03	172PE2E03
Syllabus	UNIT-V: Natural Gas; The Water Molecule; Hydrates; Water and Natural Gas; Heavy Water. Hydrate Types and Formers: Type I Hydrates; Type II Hydrates; Type H Hydrates; Size of the Guest Molecule; N-Butane; Other Hydrocarbons; Cyclopropane; 2-Butane; Hydrogen and Helium; Chemical Properties of potential Guests; Liquid Hydrate Formers	UNIT-V: Hydrates, Wax &Asphaltenes: Physics & Phase Behavior; Hydrate Prevention; Hydrate Remediation; Hydrate Control Design Philosophies; Recovery of Thermodynamic Hydrate Inhibitors. Wax; Wax Management; Wax remediation; Asphaltenes; Asphaltene control design philosophies

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Department of Petroleum Technology

1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Characterization Of Petroleum Oils	Characterization Of Petroleum Oils
Course Code	172PE2E06	172PE2E06
Syllabus	UNIT-V: Chemicals from gas reforming: Methanol- Acetic acid- Ammonia and urea. Chemicals from ethylene: Ethylene oxide-Monoethylene glycol-Ethyl benzene-Styrene. Polymers: LDPE, HDPE & LLDPE and Polypropylene – PVC - Polystyrene.	UNIT-V: Thermodynamic Relations for Property Estimation: Definitions and fundamental thermodynamic relations; Generalized correlations for calculation of thermodynamic properties; Properties of Ideal gases; Thermodynamic properties of mixtures; Phase equilibria of pure components; Phase equilibria of mixtures; general methods for calculation of properties of real mixtures; Use of velocity of sound for prediction of fluid properties.

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Department of Civil Engineering

Syllabus revision Index for the Academic Year 2018-2019 M.Tech Structural Engineering

S.No	Name of the course	Percentage of syllabus change
1	Mechanics of Composite Material	30
2	Fracture Mechanics	20
3	Industrial Structures	20
4	Earth Retaining Structures	20

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	Mechanics Of Composite Materials	Mechanics Of Composite Materials
Course Code	172se2e08	172se2e08
Syllabus	UNIT-I Introduction to Composite Materials Introduction, Classification: Polymer Matrix Composites, Metal Matrix Composites, Ceramic Matrix Composites, Carbon–Carbon Composites, FiberReinforced Composites and nature-made composites, and application Reinforcements: Fibres- Glass, Silica, Kevlar, carbon, boron, silicon carbide, and born carbide fibres. Particulate composites, Polymer composites, Thermoplastics, Thermo setts, Metal matrix and ceramic composites.- Manufacturing methods: Autoclave, tape production, moulding methods, filament winding, man layup, pultrusion,RTM.	**UNIT-I** **Introduction to Composite Materials** **Introduction,** **Classification:** Polymer Matrix Composites, Metal Matrix Composites, Ceramic Matrix Composites, Carbon–Carbon Composites, Fiber- Reinforced Composites and nature-made composites, and application- **Reinforcements:** Fibres-Glass, Silica, Kevlar, carbon, boron, silicon carbide, and born carbide fibres. Particulate composites, Polymer composites, Thermoplastics, Thermo setts, Metal matrix and ceramic composites.- Manufacturing methods: Autoclave, tape production, moulding methods, filament winding, man layup, pultrusion, RTM.
	UNIT-II Micromechanical Analysis of a Lamina Introduction, Definitions: Stress, Strain, Elastic Moduli, Strain Energy. Hooke's Law	**UNIT-II** **Micromechanical Analysis of a Lamina** **Introduction,**

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	for Different Types of Materials, Hooke's Law for a Two-Dimensional Unidirectional Lamina, Plane Stress Assumption, Reduction of Hooke's Law in Three Dimensions to Two Dimensions, Relationship of Compliance and Stiffness Matrix to Engineering Elastic Constants of a Lamina.	**Definitions:** Stress, Strain, Elastic Moduli, Strain Energy. Hooke's Law for Different Types of Materials, Hooke's Law for a Two-Dimensional Unidirectional Lamina, Plane Stress Assumption, Reduction of Hooke's Law in Three Dimensions to Two Dimensions, Relationship of Compliance and Stiffness Matrix to Engineering Elastic Constants of a Lamina.
	UNIT –III Higro Thermal Stress in Lamina Hooke's Law for a Two-Dimensional Angle Lamina, Engineering Constants of an Angle Lamina, Invariant Form of Stiffness and Compliance Matrices for an Angle Lamina Strength Failure Theories of an Angle Lamina : Maximum Stress Failure Theory Strength Ratio, Failure Envelopes, Maximum Strain Failure Theory ,Tsai– Hill Failure Theory, Tsai–Wu Failure Theory, Comparison of Experimental Results with Failure Theories. Hygrothermal Stresses and Strains in a Lamina: Hygrothermal Stress–Strain Relationships for a Unidirectional Lamina, Hygrothermal Stress–StrainRelationshipsfor an AngleLamina.	**UNIT –III** **Higro Thermal Stress in Lamina** Hooke's Law for a Two-Dimensional Angle Lamina, Engineering Constants of an Angle Lamina, Invariant Form of Stiffness and Compliance Matrices for an Angle Lamina Strength Failure Theories of an Angle Lamina **Analysis of Laminated Compsites** Governing equations for an isotropic and orthotropic plate - Angle-ply and cross ply laminates. Static, dynamic and stability analysis for simpler cases of composite plates - Inter laminar stresses
	UNIT-IV Micromechanical Analysis of a Lamina Introduction, Volume and Mass Fractions, Density, and Void Content, Evaluation of the Four Elastic Moduli, Strength of Materials	**UNIT-IV** **Failure and Fracture of Composite** Netting analysis - Failure criterion - Maximum stress,

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	Approach, Semi-Empirical Models, Elasticity Approach, Elastic Moduli of Lamina with Transversely Isotropic Fibers, Ultimate Strengths of a Unidirectional Lamina, Coefficients of Thermal Expansion, Coefficients of Moisture Expansion.	maximum strain - fracture mechanics of composites - Sandwich construction.
	UNIT-V Micromechanical Analysis of Laminates Introduction, Laminate Code, Stress–Strain Relations for a Laminate, In-Plane and Flexural Modulus of a Laminate, Hygrothermal Effects in a Laminate, Warpage of Laminates -Failure, Analysis, and Design of Laminates: Introduction, Special Cases of Laminates, Failure Criterion for a Laminate, Design of a Laminated Composite.	**UNIT-V** **Micromechanical Analysis of Laminates** Introduction, Laminate Code, Stress–Strain Relations for a Laminate, In-Plane and Flexural Modulus of a Laminate, Hygrothermal Effects in a Laminate, Warpage of Laminates -Failure, Analysis, and Design of Laminates: Introduction, Special Cases of Laminates, Failure Criterion for a Laminate, Design of a Laminated Composite.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	FRACTURE MECHANICS	FRACTURE MECHANICS
Course Code	172SE2E09	172SE2E09
Syllabus	UNIT-I Introduction Fundamentals of elastic and plastic behavior of materials-stresses in a plate with a hole – Stress Concentration factor-modes of failure-Brittle fracture and ductile fracture-history of fracture mechanics-Griffiths criteria for crack propagation cracksEnergy release rate, GI GII and GIII - Critical energy release rate GIc , GIIc and GIIIc – surface energy - R curves – compliance.	.UNIT-I **Introduction** Fundamentals of elastic and plastic behavior of materials-stresses in a plate with a hole – Stress Concentration factor-modes of failure-Brittle fracture and ductile fracture- history of fracture mechanics-Griffiths criteria for crack propagation cracks-Energy release rate, GI GII and GIII - Critical energy release rate GIc , GIIc and GIIIc – surface energy - R curves – compliance.
	UNIT-II Principles of Linear Elastic Fracture Mechanics SOM vs Fracture Mechanics -stressed based Criteria for fracture- Stress Intensity Factors- KI K II and K III – Critical stress Intensity Factors, KIc KIIc and KIIc – crack tip plastic zone – Erwin's plastic zone correction-Critical crack length-Load carrying capacity of a cracked component- Design of components based on fracture mechanics.	**UNIT-II** **Principles of Linear Elastic Fracture Mechanics** SOM vs Fracture Mechanics -stressed based Criteria for fracture- Stress Intensity Factors- KI K II and K III – Critical stress Intensity Factors, KIc KIIc and KIIc – cracktip plastic zone – Erwin's plastic zone correction-Critical crack length-Load carrying capacity of a cracked component- Design of components based on fracture mechanics.

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	UNIT –III Mixed Mode Crack Propagation Maximum tangential stress criterion – crack propagation angle-Material characterization by Crack Tip Opening Displacements (CTOD)- Crack Mouth Opening Displacement(CMOD)- Critical crack tip opening displacement (CTODc) –critical Crack Mouth Opening Displacement (CMODc).	**UNIT –III** **Mixed Mode Crack Propagation** Maximum tangential stress criterion – crack propagation angle-Material characterization by Crack Tip Opening Displacements (CTOD)-Crack Mouth Opening Displacement(CMOD)-Critical crack tip opening displacement (CTODc) – critical Crack Mouth Opening Displacement (CMODc).
	UNIT-IV Fatigue Crack Propagation Fatigue load parameters Fatigue crack growth curve –Threshold stress intensity factor-Parislaw-Retardation effects.	**UNIT-IV** **Fatigue Crack Propagation** Fatigue load parameters Fatigue crack growth curve –Threshold stress intensityfactor-Paris law-Retardation effects.
	UNIT-V Applications of Fracture Mechanics Applications of fracture Mechanics to concrete- reasons –strain softening behaviour – Bazant's size effectlaw.	**UNIT-V** **Fracture of Steel** Fracture - Fracture under extreme conditions - Fatigue - Environment sensitive cracking.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	INDUSTRIAL STRUCTURES	INDUSTRIAL STRUCTURES
Course Code	172SE2E10	172SE2E10
Syllabus	UNIT-I Planning and Functional Requirements Classification of industries and industrial structures-planning for layoutrequirements regarding lighting ventilation and fire safety- protection against noise and vibrations.	**UNIT-I** **Planning and Functional Requirements** Classification of industries and industrial structures- planning for layout- requirements regarding lighting ventilation and fire safety-protection against noise and vibrations.
	UNIT-II Industrial Buildings Roofs for industrial buildings (Steel) - design of gantry girder- design of corbels and nibs-machine foundations.	**UNIT-II** **Industrial Buildings** Roofs for industrial buildings (Steel) - design of gantry girder- design of corbelsand nibs-machine foundations.
	UNIT –III Design of Folded Plates Design considerations- analysis of folded plates- analysis of multibuy folded platesdesign of diaphragm beam.	**UNIT –III** **Design of Folded Plates** Design considerations-analysis of folded plates-analysis of multibuy folded plates-design of diaphragm beam.
	UNIT-IV Power Plant Structures Bunkers and silos- chimney and cooling towers-Nuclear containment structures.	**UNIT-IV** **Power Plant Structures** Bunkers and silos- chimney and cooling towers-Nuclear containment structures.

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	UNIT-V Power Transmission Structures Transmission line towers-tower foundations-testing towers.	**UNIT-V** **Auxiliary Structures** Intro to Wind load calculations - Design of steel and RCC Chimneys - Bunkers and silos - Flat and conical bottoms.

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1.1.2. Table-Prior/Post revision of syllabus

Regulation	Pre-Revision	Post-Revision
Course Title	EARTH RETAINING STRUCTURES	EARTH RETAINING STRUCTURES
Course Code	**172SE2E12**	**172SE2E12**
Syllabus	UNIT-I Earth Pressures Different types and their coefficients- Classical Theories of Earth pressure – Rankine's and Coulomb's Theories for Active and Passive earth pressure- Computation of Lateral Earth Pressure in Homogeneous and Layered soils- Graphical solutions for Coulomb's Theory in active and passive conditions.	**UNIT-I** **Earth Pressures** Different types and their coefficients- Classical Theories of Earth pressure – Rankine's and Coulomb's Theories for Active and Passive earth pressure- Computation of Lateral Earth Pressure in Homogeneous and Layered soils- Graphical solutions for Coulomb's Theory in active and passive conditions. Concept of strain dependence of developed stresses, active, at rest and passive conditions, plastic equilibrium Hansen theoretical derivation and graphical construction with different geometric and boundary conditions.
	UNIT-II Retaining Walls Different types - Type of Failures of Retaining Walls Stability requirements – Drainage behind Retaining walls – Provision of Joints – Relief Shells.	**UNIT-II** **Retaining Walls** Different types - Type of Failures of Retaining Walls Stability requirements – Drainage behind Retaining walls – Provision of Joints – Relief Shells.
	UNIT –III Sheet pile Structures Types of Sheet piles – Cantilever sheet piles in sands and clays –	**UNIT –III** **Sheet pile Structures**

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	Anchored sheet piles – Free earth and Fixed earth support methods – Row's moment reduction method – Location of anchors, Forces in anchors.	Types of Sheet piles – Cantilever sheet piles in sands and clays – Anchored sheet piles – Free earth and Fixed earth support methods – Row's moment reduction method – Location of anchors, Forces in anchors.
	UNIT-IV Soil Reinforcement Reinforced earth - Different components – their functions – Mechanics of reinforced earth – Failure modes-Failure theories – Design of Embankments on problematic soils.	**UNIT-IV** **Soil Reinforcement** Reinforced earth - Different components – their functions – Mechanics of reinforced earth – Failure modes-Failure theories – Design of Embankments on problematic soils. Stability of earth dams during different stages - during and at end of construction, steady seepage, sudden draw down, estimation of pore water pressure - use of stability charts.
	UNIT-V Braced Cuts and Cofferdams Lateral Pressure in Braced cuts – Design of Various Components of a Braced cut – Stability of Braced cuts – Bottom Heave in cuts. – types of cofferdam, suitability, merits and demerits – Design of single – wall cofferdams and their stability aspects VA method and Cummins' methods.	**UNIT-V** **Braced Cuts and Cofferdams** Lateral Pressure in Braced cuts – Design of Various Components of a Braced cut – Stability of Braced cuts – Bottom Heave in cuts. – types of cofferdam, suitability, merits and demerits – Design of single – wall cofferdams and their stability aspects VA method and Cummins' methods.

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Department of Management Studies

Syllabus revision Index (2018-19)

S.No	Name of the course	Percentage of syllabus change
1.	Cyber Laws & Security	20
2.	Information Systems & Audit	20

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1.1.2. Table-Prior/Post revision of syllabus (2018-19)

Regulation	Pre-Revision	Post-Revision
Course Title	Information Systems & Audit	Information Systems & Audit
Course Code	174SY4E04	174SY4E04
Syllabus	Overview of Information System Auditing: Effect of Computers on Internal Controls, Effects of Computers on Auditing, Foundations of information Systems Auditing, Conducting an Information Systems Audit.	UNIT-1: Overview of Information System Auditing: Effect of Computers on Internal Controls, Effects of Computers on Auditing, Foundations of information Systems Auditing, Conducting an Information Systems Audit.
	. UNIT-2: The Management Control UNIT-II: The Management Control Framework-I: Introduction, Evaluation the Planning Function, Leading Function and Controlling Function, Systems Development - Management Controls, Approaches to Auditing Systems Development , Normative Models of the Systems Development Process, Evaluating the Major phases in the Systems Development Process, Programming Management Controls, Data Resource Management Controls	UNIT-2: The Management Control Framework-I: Introduction, Evaluation the Planning Function, Leading Function and Controlling Function, Systems Development - Management Controls, Approaches to Auditing Systems Development , Normative Models of the Systems Development Process, Evaluating the Major phases in the Systems Development Process, Programming Management Controls, Data Resource Management Controls
	UNIT-III: The Management Control Framework-II: Security Management Controls, Operations Management Controls Quality Assurance Management Controls- Case Studies. UNIT-V: Evidence Evaluation: Evaluating Asset Safeguarding and Data Integrity, Evaluating System Effectiveness, Evaluating System Efficiency. Information Systems Audit	UNIT_III Database Management – Data Base Concepts – Data Structure – Data Base Management System – Data Base Files – Data Mining and Warehousing

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	and Management: Managing the Information Systems Audit Function	
	UNIT-IV: Evidence Collection: Audit Software, Code Review, Test Data, and Code Comparison, Concurrent Auditing techniques, Interviews, Questionnaires, and Control Flowcharts. Performance Management tools- Case Studies.	. UNIT-4: Evidence Collection: Audit Software, Code Review, Test Data, and Code Comparison, Concurrent Auditing techniques, Interviews, Questionnaires, and Control Flowcharts. Performance Management tools- Case Studies
	. UNIT-5: Evidence Evaluation: Evaluating Asset Safeguarding and Data Integrity, Evaluating System Effectiveness, Evaluating System Efficiency. Information Systems Audit and Management: Managing the Information Systems Audit Function,	. UNIT-5: Evidence Evaluation: Evaluating Asset Safeguarding and Data Integrity, Evaluating System Effectiveness, Evaluating System Efficiency. Information Systems Audit and Management: Managing the Information Systems Audit Function

Signature of the course coordinator

Signature of the HOD

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1.1.2. Table-Prior/Post revision of syllabus (2018-19)

Regulation	Pre-Revision	Post-Revision
Course Title	Cyber Laws & Security	Cyber Laws & Security
Course Code	174SY4E03	174SY4E03
Syllabus	UNIT-1: Introduction to Computer Security: Definition, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity.	Introduction to Computer Security: Definition, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity.
	UNIT-2: Secure System Planning and administration: Introduction to the orange book, Security policy requirements, accountability, assurance and documentation requirements, Network Security, The Red book and Government network evaluations	UNIT-2: Secure System Planning and administration: Introduction to the orange book, Security policy requirements, accountability, assurance and documentation requirements, Network Security, The Red book and Government network evaluations
	UNIT-3: Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies - process management-planning and preparationdeveloping policies-asset classification policy-developing standards	UNIT-3: Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies - process management-planning and preparationdeveloping policies-asset classification policy-developing standards
	. UNIT-4: Information security: fundamentals-Employee responsibilities- information classification Information handling-Tools of information security-Information processing-secure	. UNIT-4: Information security: fundamentals-Employee responsibilities- information classification Information handling-Tools of information security-Information processing-secure program

	program administration.	administration.
	UNIT-5: Organizational and Human Security: Adoption of Information Security Management Standards, Human Factors in Security- Role of information security professionals. Relevant cases have to be discussed in each unit and in examination case is compulsory from any unit	UNIT-5: E - commerce and Laws in India (a) Digital ,Electronic Signature in Indian Laws E – Commerce; Issues and provisions in Indian Law E – Governance; concept and practicality in India E – Taxation issues in Cyberspace E – Contracts and its validity in India Cyber Tribunal & Appellate Tribunal (g) Cyber Regulations

D. Maheswari

Signature of the course coordinator

D. Viral

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