MA201BS:ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

B.Tech.IYearII Sem.   LT   PC
                                                                  3   0   03

Pre-requisites: MathematicalKnowledgeatpre-universitylevel
CourseObjectives: Tolearn
1. Methodsofsolvingthedifferentialequationsoffirstandhigherorder.
2. Concept,propertiesofLaplacetransforms.
3. SolvingordinarydifferentialequationsusingLaplacetransformstechniques.
4. Thephysicalquantitiesinvolvedinengineeringfieldrelatedtovectorvaluedfunctions
5. Thebasicpropertiesofvectorvaluedfunctionsandtheirapplicationstoline,surfaceand volume integrals

Courseoutcomes: Afterlearningthecontentsofthis paper,thestudentmustbeable to
1. Identifywhetherthegivendifferentialequationoffirstorderisexactor not
2. Solve higher differential equation and apply the concept of differential equation to real world problems.
3. UsetheLaplaceTransformstechniquesforsolvingOrdinaryDifferentialEquations.
4. EvaluatetheLine,SurfaceandVolumeintegralsandconvertingthem fromonetoanother

UNIT-I: First Order Ordinary Differential Equations   8 L
Exactdifferentialequations– Equationsreducibletoexactdifferentialequations–linearand Bernoulli'sequations–OrthogonalTrajectories(onlyinCartesianCoordinates).Applications: Newton'slawofcooling–Lawofnaturalgrowthanddecay.

UNIT-II: Ordinary Differential Equations of Higher Order   10   L
Higher order linear differential equations with constant coefficients: Non-Homogeneous terms of the typee^{ax},$\sin \square \square$,$\cos \square \square$,polynomialsin$\square$,$e^{ax}(\square)$and$\square \square(\square)$-Methodofvariationofparameters.

UNIT-III:LaplaceTransforms   10L
Laplace Transforms: Laplace Transform of standard functions –First shifting theorem –Laplace transforms of functions multiplied by 't' and divided by 't' –Laplace transforms of derivatives and integralsoffunction–EvaluationofintegralsbyLaplacetransforms–Laplacetransformofperiodic functions –Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV:VectorDifferentiation   10L
Vectorpointfunctionsand   scalar   pointfunctions   –Gradient   –DivergenceandCurl–Directional derivatives - Vector Identities - Scalar potential functions - Solenoidal and Irrotational vectors.

UNIT-V:VectorIntegration   10L
Line, Surface and Volume Integrals.Theorems of Green, Gauss and Stokes (without proofs) and their applications

TEXTBOOKS:
1. B.S.Grewal,HigherEngineeringMathematics,KhannaPublishers,36thEdition,2010.
2. R.K. Jain and S.R.K. Iyengar, AdvancedEngineeringMathematics, Narosa Publications, 5thEdition, 2016.

REFERENCEBOOKS:
1. ErwinKreyszig,AdvancedEngineeringMathematics,9thEdition,JohnWiley&Sons,2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition, Pearson, Reprint, 2002.
3. N.P.BaliandManishGoyal,A textbookofEngineeringMathematics,LaxmiPublications, Reprint, 2008.
4. H. K. Dass and Er. RajnishVerma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

PH202BS:ADVANCED ENGINEERING PHYSICS

B.Tech.IYear IISem.   LT   PC
                                                                                                                        3   0   03
Pre-requisites:10+2Physics

Course Objectives:
1. To study crystal structures, defects, andmaterial characterization techniqueslike XRD andSEM.
2. To understand fundamental concepts of quantum mechanics and their applications in solids and nanomaterials.
3. Tointroducequantumcomputingprinciples,quantumgates,andbasicquantum algorithms.
4. Tolearnthepropertiesandapplicationsofmagneticanddielectricmaterials.
5. Toexploretheworkingandapplicationsoflasersandfibreopticsinmoderntechnology.

Course Outcomes:
1. **CO1**:Analyzecrystalstructures,identifydefects,andapplyXRDandSEMtechniquesfor material characterization.
2. **CO2**:Applyquantummechanicalprinciplestoexplainparticlebehaviourandenergyband formation in solids.
3. **CO3**:Understandquantumcomputingconcepts,usequantumgates,andexplainbasic quantum algorithms.
4. **CO4**: Classify magnetic and dielectric materials and explain their properties, synthesis, andapplications.
5. **CO5**: Explain the principles of lasers and fibre optics and their applications in communication and sensing.

UNIT-I:Crystallography&MaterialsCharacterization
Introduction: Unit cell, space lattice, basis, lattice parameters; crystal structures, Bravais lattices, packing factor: SC, BCC, FCC; Miller indices, inter-planar distance; defects in crystals (Qualitative): point defects, line defects, surface defects and volume defects. concept of nanomaterials: surface to volume ratio, X - ray diffraction: Bragg's law, powder method, calculation of average crystallite size using Debye Scherrer's formula, scanning electron microscopy (SEM): block diagram, working principle.

UNIT-II:QuantumMechanics
Introduction, de-Broglie hypothesis, Heisenberg uncertainty principle, physical significance of wave function, postulates of quantum mechanics: operators in quantum mechanics, eigen values and eigen functions, expectation value; Schrödinger's time independent wave equation, particle in a 1D box, Bloch's theorem (qualitative), Kronig-Penney model (qualitative): E-k diagram, effective mass of electron, formation of energy bands, origin of bandgap, classification of solids, concept of discrete energy levels and quantum confinement in nanomaterials.

UNIT-III:QuantumComputing
Introduction, linear algebra for quantum computation, Dirac's Bra and Ket notation and theirproperties, Hilbert space, Bloch's sphere, concept of quantum computer, classical bits, Qubits,multiple Qubit system, quantum computing system for information processing, evolution of quantum systems, quantum measurements, entanglement, quantum gates, challenges and advantages of quantum computing over classical computation, quantum algorithms: Deutsch-Jozsa, Shor, Grover.

UNIT-IV:MagneticandDielectricMaterials
Introduction to magnetic materials, origin of magnetic moment-classification of magnetic materials, hysteresis, Weiss domain theory of ferromagnetism, soft and hard magnetic materials, synthesis of ferrimagnetic materials using sol-gel method, applications: magnetic hyperthermia for cancer treatment, magnets for EV, Giant Magneto Resistance (GMR) device.

Introduction to dielectric materials, types of polarization (qualitative): electronics, ionic & orientation; ferroelectric, piezoelectric, pyroelectric materials and their applications: Ferroelectric Random-Access Memory (Fe-RAM), load cell and fire sensor.

UNIT-V:LaserandFibreOptics
Introductionto laser,characteristicsof laser, Einstein coefficients andtheir relations,metastablestate, population inversion, pumping, lasing action, Ruby laser, He-Ne laser, CO_2laser, semiconductordiode laser, applications: Bar code scanner, LIDAR for autonomous vehicle.
Introduction to fibre optics, total internal reflection, construction of optical fibre, acceptance angle, numerical aperture, classification of optical fibres, losses in optical fibre, applications: optical fibre for communication system, sensor for structural health monitoring.

TEXTBOOKS:
1. WalterBorchardt-Ott,*Crystallography:AnIntroduction*,Springer.
2. CharlesKittel,*IntroductiontoSolidStatePhysics*,JohnWiley&Sons,Inc.
3. ThomasG.Wong,*IntroductiontoClassicalandQuantumComputing*,RootedGrove

REFERENCEBOOKS:
1. JozefGruska,*QuantumComputing*,McGrawHill
2. MichaelA.Nielsen&IsaacL.Chuang,*QuantumComputationandQuantumInformation*, Cambridge University Press.
3. JohnM.Senior,*Optical Fiber Communications Principles and Practice*,PearsonEducation Limited.

UsefulLinks
- https://shijuinpallotti.wordpress.com/wp-content/uploads/2019/07/optical-fiber-communications-principles-and-pr.pdf
- https://www.geokniga.org/bookfiles/geokniga-crystallography_0.pdf
- https://dpbck.ac.in/wp-content/uploads/2022/10/Introduction-to-Solid-State-PhysicsCharles-Kittel.pdf
- https://www.thomaswong.net/introduction-to-classical-and-quantum-computing-1e4p.pdf
- https://www.fi.muni.cz/usr/gruska/qbook1.pdf
- https://profmcruz.wordpress.com/wp-content/uploads/2017/08/quantum-computation-and-quantum-information-nielsen-chuang.pdf

CS203ES:DATA STRUCTURES

B.Tech.IYear II Sem.   **LT   PC**

                                                                      3   0   03

Prerequisites :Acourseon "Programming for Problem Solving

Course Objectives
- Exploring basic data structures such as stacks and queues.
- Introduces a variety of data structuressuchashashtables,searchtrees,tries,heaps,graphs.
- Introducessortingandpatternmatchingalgorithms.

CourseOutcomes
- Abilitytoselectthedatastructures thatefficientlymodelthe informationinaproblem.
- Abilitytoassessefficiencytrade-offsamongdifferentdatastructureimplementationsor combinations.
- Implementandknowtheapplicationofalgorithmsforsortingandpatternmatching.
- Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.

UNIT–I
Introduction to Data Structures: Basic Terminology, Classification of Data Structures, Operation on DataStructures, abstractdata types, selectinga DataStructure,Linear list – Introduction, singly linked list, Circular Linked Lists, Doubly Linked List, Stacks- Operations, Stack algorithm, Stack ADT, Stack applications, Queues- operations, Queue Algorithm, Queue ADT, Queue Applications.

UNIT-II
Trees: Introduction, Types of Trees, creating a Binary Tree from a General Tree, traversing a Binary Tree, BinarySearch Trees (BST),BST Operations- Searching, Insertion andDeletion, BST ADT,BST Applications, Threaded Binary Trees, AVL Trees, Red -Black Trees, Splay Trees

UNIT–III
Multi way Search Trees: Introduction, B Trees,B Trees ADT,2-3Trees,2-3- Tree, B* Tree, B+ Trees
Heaps: BinaryHeaps,Binomialheaps,Fibonacci heaps, Comparison of Various Heaps, Applications
Searching: Introduction, Interpolation Search, Jump search

UNIT-IV
Graphs: Introduction, Directed Graphs, Bi connected Components, Representation of Graphs, Graph Traversal Algorithms, Graph ADT, Applications of Graphs
Sorting:RadixSort,Heapsort,ShellSort,Tree Sort,

UNIT–V
Hashing and Collision: Introduction, Hash Tables, Hash Functions, Different Hash Functions: Division Method, Multiplication Method, Mid-square Method, Folding Method; collisions: Collision Resolutionby Open Addressing, Collision Resolution by Chaining
Files and their Organization: Introduction, Data hierarchy, File Attributes, Text and Binary Files, Basic File Operations, File Organization, Indexing

TEXTBOOKS:
1. DataStructures:APseudocodeApproachwithC,2ndEdition,R.F.Gilbergand B.A.Forouzan, Cengage Learning
2. DataStructureusingC-ReemaThareja,3rdEdition,OxfordUniversity Press.

REFERENCE:
1. Data Structures using C - A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

EE204ES:BASIC ELECTRICAL ENGINEERING

B.Tech. IYear IISem.

L	T	P	C
3	0	0	3

Prerequisites: Mathematics

Course Objectives:

- To understand DC and Single& Three phase AC circuits
- To study and understand the different types of DC, AC machines and Transformers.
- To import the knowledge of various electrical installations and the concept of power, powerfactor and its improvement.

CourseOutcomes: Afterlearningthecontentsofthispaperthestudentmustbeableto

- UnderstandandanalyzebasicElectricalcircuits
- StudytheworkingprinciplesofElectricalMachinesandTransformers
- IntroducecomponentsofLowVoltageElectricalInstallations.

Course Objectives	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Tounderstand DC and Single &T hreephase ACcircuits.	3	2	1		2	0	0	1	2	0	1	2
Tostudyand understand the different typesofDC, ACmachines and Transformers.	3	2	1	1	3	0	0	0	2	0	1	1
Toimportthe knowledgeof various electrical installations and the concept of power, power factorandits improvement.	3	2	0		3	0	0	0	1	2	1	1

Course Outcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Understand	3	2	1	0	1	0	0	0	2	0	2	2

andanalyseb asic Electrical circuits												
Study the working principlesof Electrical Machinesand Transformer s	3	2	1	0	3	1	0	1	1	2	1	2
Introduce components of Low Voltage Electrical Installations.	3	2	1	1	3	2	0	0	1	0	2	2

UNIT-I:

D.C. Circuits: Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems.Time-domain analysis of first-order RL and RC circuits.

UNIT-II:

A.C. Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance in series R-L-C circuit. Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III:

Transformers: Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

UNIT-IV:

Electrical Machines: Construction and working principle of dc machine, performance characteristics of dc shuntmachine. Generation of rotating magnetic field, Construction and working of a three-phase induction motor, Significance of torque-slip characteristics. Single-phase induction motor,Construction and working.Construction and working of synchronous generator.

UNIT-V:

Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB,MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXTBOOKS:
1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4thEdition,2019.
2. MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGraw Hill, 2ndEdition, 2008.

REFERENCEBOOKS:

1. P.Ramana,M.Suryakalavathi,G.T.Chandrasheker,"BasicElectricalEngineering",S.Chand, 2nd Edition, 2019.
2. D.C.Kulshreshtha ,"BasicElectricalEngineering",McGrawHill, 2009
3. M.S.Sukhija,T.K.Nagsarkar,"BasicElectricalandElectronicsEngineering",Oxford,1st Edition, 2012.
4. AbhijitChakrabarthi,SudiptaDebnath,ChandanKumarChanda,"BasicElectricalEngineering", 2nd Edition, McGraw Hill, 2021.
5. L.S.Bobrow,"FundamentalsofElectricalEngineering",OxfordUniversityPress,2011.
6. E.Hughes,"ElectricalandElectronicsTechnology",Pearson,2010.
7. V.D.Toro,"ElectricalEngineeringFundamentals",PrenticeHallIndia,1989

ME205ES:ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING

B.Tech. IYear IISem.   LT   PC
                                                                                               2   0   23

Course Objectives:
1. Tointroducethefundamentalsofengineeringdrawingandprojectionsystems.
2. Todevelopskillsinconstructingorthographic,isometric,andsectionalviews.
3. TotrainstudentsininterpretingandcreatingtechnicaldrawingsusingCADtools.
4. Tofamiliarizestudentswithdimensioningstandardsanddraftingconventions.
5. Tobridgemanualdraftingtechniqueswithcomputer-aideddraftingpractices.

Course Outcomes: Attheendofthecourse,thestudentwillbeableto:
1. Understandandapplytheprinciplesoforthographicandisometricprojections.
2. CreatesectionalviewsanddimensioneddrawingsusingBISstandards.
3. UseCADsoftwaretogenerate2Dengineering drawings.
4. Visualizeandconstructsolidmodelsfrom 2Dviews.
5. Interpretandproduceengineeringdrawingsofmechanicalcomponentsandassemblies.
6. Demonstratedraftingskillsforpracticalandindustrialapplications.

UNIT–I:IntroductiontoEngineeringGraphics(Conventional)
Principles of Engineering Graphics and their Significance, Geometrical Constructions, Scales, Plain and Diagonal, Conic Sections including the Rectangular Hyperbola, General method only. Cycloid, Epicycloid and Hypocycloid.

UNIT-II:OrthographicProjections(ConventionalandComputer Aided)
Principles of Orthographic Projections, Conventions, Projections of Points and Lines, Projections of Plane regular geometric figures.Auxiliary Planes. Computer aided orthographic projections, points, lines and planes. Introduction to Computer aided drafting, views, commands and conics.

UNIT–III:ProjectionsofRegularSolids(ConventionalandComputer Aided)
AuxiliaryViews, Sections or Sectional views of Right Regular Solids, Prism, Cylinder, Pyramid, Cone, Auxiliary views, Computer aided projections of solids, sectional views

UNIT–IV:DevelopmentofSurfaces(Conventional):Prism,Cylinder,PyramidandCone.

UNIT–V:IsometricProjections(ConventionalandComputer Aided)
Principles of Isometric Projection, Isometric Scale, Isometric Views, Conventions, Isometric Views of Lines, Plane Figures, Simple and Compound Solids, Isometric Projection of objects having non, isometriclines.IsometricProjection of Spherical Parts.Conversion of IsometricViews toOrthographic Views and Vice- versa, Conventions.Conversion of orthographic projection into isometric view.

Note:
1. TheEndSemesterExaminationwillbeinconventionalmode.
2. CIE-Iwillbeinconventionalmode.
3. CIE-IIwillbeusingComputer.

TEXTBOOKS:
1. EngineeringDrawing,N.D.Bhatt,Charotar,54[th]Edition,2023.
2. Engineering Drawing and graphics Using AutoCAD, T. Jeyapoovan and Vikas, S. Chand and company Ltd., 3[rd]Edition, 2010.

REFERENCEBOOKS:
1. EngineeringDrawing,BasantAgrawalandC.M.Agrawal,McGrawHill,3[rd]Edition,2019.
2. EngineeringGraphicsandDesign,WILEY,JohnWileyandSonsInc,3[rd]Edition,2020.
3. EngineeringDrawing,M.B.ShahandB.C.Rane,Pearson,2[nd]Edition, 2009.
4. EngineeringDrawing,N.S.ParthasarathyandVelaMurali,Oxford,1[st]Edition,2015.
5. ComputerAidedEngineeringDrawing,K.BalaveeraReddy,CBSPublishers,2[nd]Edition, 2015.

PH206BS:ADVANCED ENGINEERING PHYSICS LAB

B.Tech.I Year IISem.   **LT   PC**
                                                                                                 0   0   21

Course Objectives:
1. Toprovidepracticalexposuretoadvancedconceptsinsolid-stateandmodernphysics.
2. Tosynthesizeandstudythephysicalpropertiesofmaterialslikesemiconductors, ferromagnetic, and ferroelectric substances.
3. ToperformsemiconductorcharacterizationusingHalleffectandbandgapexperiments.
4. Toexploretheworkingprinciplesoflasersandopticalfibersthroughhands-onexperiments.
5. Todevelopskillsindataanalysis,interpretation,andscientificreporting.

Course Out comes:
1. **CO1:**Synthesizeandanalyzenanomaterialssuchasmagnetite(Fe_3O_4)usingchemical methods.
2. **CO2:** Determine key electrical, magnetic, and optical properties of semiconductors and other functional materials.
3. **CO3:**CharacterizesemiconductorsusingHalleffectandenergygapmeasurementtechniques.
4. **CO4:** Demonstrate working knowledge of laser systems and optical fiber parameters through experimental study.
5. **CO5:**Applyscientificmethodsforaccuratedatacollection,analysis,andtechnicalreport writing.

Listof Experiments:
1. Synthesis of magnetite(Fe_3O_4)powder usings ol-gelmethod.
2. Determination of energygapof asemiconductor.
3. DeterminationofHallcoefficientandcarrierconcertationofagivensemiconductor.
4. Determinationofmagneticmomentofabarmagnetandhorizontalearthmagneticfield.
5. Study of B-H curveof aferromagnetic material.
6. Studyof P-Eloopof agivenferroelectric crystal.
7. Determinationofdielectricconstantofagivenmaterial.
8. DeterminationofCurie'stemperatureofagivenferroelectricmaterial.
9. A)Determinationofwavelengthofalaserusingdiffractiongrating.
   B) StudyofV-I&L-Icharacteristicsofagivenlaserdiode.
10. A)Determinationofnumericalapertureofagivenopticalfibre.
    B) Determinationofbendinglossesofagivenopticalfibre.

Note:Any8experimentsaretobeperformed.

CS207ES:DATA STRUCTURES LAB

B.Tech.IYearII Sem.   LT   PC
                                                                      0   0   21

Prerequisites:1.ACourseon"Programmingforproblem solving".

Course Objectives:
1. It covers various concepts of C programming language
2. It introduces searching and sorting algorithms
3. Itprovidesanunderstandingofdatastructuressuchasstacksandqueues.

Course Outcomes:
1. Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
2. Ability to Implement searching and sorting algorithms

Listof Experiments
1. Writeaprogramthatusesfunctionstoperformthefollowingoperations onsinglylinkedlist.:
   i) Creation   ii)Insertion   iii)Deletion   iv)Traversal
2. Writeaprogramthatusesfunctionstoperformthefollowingoperations ondoublylinkedlist.:
   i) Creation   ii)Insertion   iii)Deletion   iv)Traversal
3. Writeaprogramthatusesfunctionstoperformthefollowingoperations oncircularlinkedlist.:
   i) Creation   ii)Insertion   iii)Deletion   iv)Traversal
4. Writeaprogramthatimplementstack(itsoperations)using
   i) Arrays   ii) ADT
5. Writeaprogram thatimplementQueue(itsoperations)using
   i) Arrays   ii) ADT
6. Write a program that implements the following sorting methods to sort a given list of integers in ascending order
   i) RadixSort,ii)Heapsort, iii)ShellSort, iv)TreeSort
7. Writeaprogramtoimplementthetreetraversalmethods(RecursiveandNon-Recursive).
8. Writeaprogramtoimplement
   i) BinarySearchtree   ii)BTrees   iii)B+Trees   iv)AVLtrees   v) Red - Blacktrees
9. Writeaprogram toimplementthegraphtraversalmethods.
10. Writea program to implement the following HashFunctions: i) Division Method, ii)Multiplication Method, iii) Mid-square Method, iv) Folding Method

TEXTBOOKS:
1. Fundamentals of Data Structures in C, 2ndEdition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
2. Data Structures using C - A. S. Tanenbaum, Y. Langsam, and M. J. Augenstein, PHI/Pearson Education.

REFERENCEBOOK:
1. Data Structures: A Pseudocode Approach with C, 2ndEdition, R. F. Gilberg and B. A. Forouzan, Cengage Learning.

EE208ES:BASIC ELECTRICAL ENGINEERING LAB

B.Tech.IYearIISem.   **LT   PC**
                                                                                0   0   21

Prerequisites:BasicElectricalEngineering
CourseObjectives:
- Tomeasuretheelectricalparametersfor differenttypesof DCand ACcircuitsusing conventional and theorems approach.
- TostudythetransientresponseofvariousR,L andCcircuits usingdifferent excitations.
- TodeterminetheperformanceofdifferenttypesofDC,ACmachinesandTransformers.

CourseOutcomes: Afterlearningthecontentsofthispaperthestudentmustbeableto
- VerifythebasicElectricalcircuitsthroughdifferentexperiments.
- EvaluatetheperformancecalculationsofElectricalMachinesandTransformersthrough various testing methods.
- AnalyzethetransientresponsesofR,LandCcircuitsfordifferentinputconditions.

CourseObjectives	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
To measure the electrical parameters for different types of DCandACcircuits usingconventional and theorems Approach	3	2	1		2	0	0	1	2	0	1	2
To study the transientresponse ofvariousR,Land C circuits using differentexcitations	3	2	1	1	3	0	0	0	2	0	1	1
To determine the performance of different types of DC,AC machines andTransformers	3	2	0		3	0	0	0	1	2	1	1

CourseOutcomes	ProgramOutcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Verify the basic Electricalcircuits throughdifferent Experiments	3	2	1	0	1	0	0	0	2	0	2	2
Evaluate the performance calculations of ElectricalMachines and Transformers through various Testingmethods	3	2	1	0	3	1	0	1	1	2	1	2
Analysethe	3	2	1	1	3	2	0	0	1	0	2	2

transient responsesofR,L and C circuits for different input conditions											

Listof experiments/demonstrations:
PART-A(compulsory)
1. VerificationofKVLandKCL
2. VerificationofThevenin'sandNorton'stheorem
3. TransientResponseofSeriesRLandRCcircuitsforDCexcitation
4. ResonanceinseriesRLCcircuit
5. Calculations and Verificationof ImpedanceandCurrentof RL,RC andRLCseries circuits
6. Measurementof Voltage,CurrentandReal Power inprimaryand SecondaryCircuitsof a Single-Phase Transformer
7. PerformanceCharacteristicsofaDCShuntMotor
8. Torque-SpeedCharacteristicsofaThree-phaseInductionMotor.

PART-B(anytwoexperimentsfromthegivenlist)
1. VerificationofSuperpositiontheorem.
2. ThreePhaseTransformer:VerificationofRelationshipbetweenVoltagesandCurrents (Star-Delta, Delta-Delta, Delta-star, Star-Star)
3. LoadTestonSinglePhaseTransformer(CalculateEfficiencyandRegulation)
4. MeasurementofActiveandReactivePowerinabalancedThree-phasecircuit
5. No-LoadCharacteristicsofaThree-phaseAlternator

TEXTBOOKS:
1. D.P. Kothariand I.J.Nagrath,"BasicElectricalEngineering",Tata McGrawHill,4thEdition, 2019.
2. MSNaiduand SKamakshaiah,"BasicElectricalEngineering",TataMcGrawHill, 2ndEdition, 2008.

REFERENCEBOOKS:
1. P.Ramana,M.Suryakalavathi,G.T.Chandrasheker,"BasicElectricalEngineering",S.Chand, 2ndEdition, 2019.
2. D.C.Kulshreshtha,"BasicElectricalEngineering",McGrawHill, 2009
3. M.S. Sukhija,T.K.Nagsarkar,"BasicElectricaland Electronics Engineering", Oxford,1stEdition, 2012.
4. AbhijitChakrabarthi,SudiptaDebnath,ChandanKumarChanda,"BasicElectrical Engineering", 2ndEdition, McGraw Hill, 2021.
5. L.S.Bobrow,"FundamentalsofElectricalEngineering",OxfordUniversityPress,2011.
6. E.Hughes,"ElectricalandElectronicsTechnology",Pearson,2010.
7. V.D.Toro,"ElectricalEngineeringFundamentals",PrenticeHallIndia,1989.

CS209ES:IT WORKSHOP

B.Tech.IYear IISem.   **L   T   PC**

                                                                                              0   0   21

Course Objectives: The IT Workshop for engineers is a training lab course spread over 60 hours.The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, PowerPoint and Publisher.

CourseOutcomes:
- PerformHardwaretroubleshooting
- UnderstandHardwarecomponentsandinterdependencies
- Safeguardcomputersystemsfrom viruses/worms
- Document/Presentationpreparation
- Performcalculationsusingspreadsheets

PCHardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw theblock diagram of the CPU along with the configuration of each peripheral and submit to yourinstructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Labinstructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should beconfiguredas dualboot with bothWindows and Linux.Labinstructors should verify the installation and follow it up with a Viva

Internet&WorldWideWeb

Task1: **Orientation & Connectivity Boot Camp:** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like MacromediaFlash and JRE for applets should be configured.

Task 3: **Search Engines & Netiquette:** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: CyberHygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize theirbrowsers to block pop ups, block active x downloads to avoid viruses and/or worms.

LaTeXandWORD

Task 1 – Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) officeorequivalent(FOSS)toolword:ImportanceofLaTeXandMSofficeorequivalent(FOSS)tool

Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word –Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders andColors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel –Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, autofill, Formatting Text

Task 2: Calculating GPA - Features to be covered:- Cell Referencing, Formulae in excel - average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

PowerPoint

Task 1: Students will be working on basic power point utilities and tools which help them create basic PowerPoint presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting -Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task3: Master Layouts (slide, template, and notes),Types of views (basic, presentation, slide slotter, notesetc),and Inserting –Background,textures,DesignTemplates,Hiddenslides.

REFERENCEBOOKS:
1. ComdexInformationTechnologycoursetoolkitVikasGupta,*WILEYDreamtech*
2. TheCompleteComputerupgradeandrepairbook,3rdeditionCherylASchmidt,*WILEY Dreamtech*
3. IntroductiontoInformationTechnology,ITLEducationSolutionslimited,*PearsonEducation.*
4. PCHardware-AHandbook-KateJ.Chase*PHI*(Microsoft)
5. LaTeXCompanion-LeslieLamport,*PHI/Pearson.*
6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David AnfinsonandKenQuamme.–*CISCOPress,PearsonEducation*.
7. ITEssentialsPCHardwareandSoftwareLabsandStudyGuideThirdEditionbyPatrick Regan–CISCO Press,*PearsonEducation.*

CS210ES:PYTHON PROGRAMMING LAB

B.Tech. IYear II Sem.   **LT   PC**
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Course Objectives:
- Toinstallandrun thePythoninterpreter
- Tolearncontrolstructures.
- ToUnderstandLists,Dictionariesinpython
- ToHandleStrings andFilesinPython

CourseOutcomes: Aftercompletionofthecourse,thestudentshouldbeableto
- Developtheapplicationspecificcodesusingpython.
- UnderstandStrings,Lists,TuplesandDictionariesinPython
- Verifyprogramsusingmodularapproach,fileI/O,Pythonstandardlibrary
- ImplementDigitalSystemsusingPython

Note:Thelabexperimentswillbelikethefollowingexperimentexamples.

Listof Experiments:
1.
   I.   Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
   II.   StartthePythoninterpreterandtypehelp()tostarttheonlinehelputility.
1. StartaPythoninterpreteranduseitas aCalculator.
2. Write a program to calculate compound interest when principal, rate and number of periods are given.
3. Read the name, address, email and phone number of a person through the keyboard andprint the details.
4. Printthebelowtriangleusingforloop. 5
      44
      333
      2222
      11111
5. Write aprogram to check whether the given inputis digit or lowercasecharacter or uppercase character or a special character(use 'if-else-if' ladder)
6. Pythonprogramtoprintallprimenumbersinagiveninterval(usebreak)
7. Writeaprogramtoconvertalistandtupleinto arrays.
8. Writeaprogramtofindcommonvalues betweentwoarrays.
9. Write a function called palindrome that takes a string argument and returnsTrue if it is a palindrome and False otherwise. Remember that you can use the built-in function len tocheck the length of a string.
10. Write a function called is_sorted that takes a list as a parameter and returns True if the listis sorted in ascending order and False otherwise.
11. Write a function called has_duplicates that takes a list andreturns True if there is anyelement that appears more than once. It should not modify the original list.
12. Write a function called remove_duplicates that takes a list and returns a new list with only the unique elements from the original. Hint: they don't have to be in the same order.
13. The wordlist I provided, words.txt, doesn't contain single letter words. So you might want to add "I", "a", and the empty string.

14. Write a python code to read dictionary values from the user. Construct a function to invert its content. i.e., keys should be values and values should be keys.
15. Addacommabetweenthecharacters.Ifthegiven wordis'Apple',itshouldbecome 'A,p,p,l,e'
16. Removethe givenwordin alltheplacesina string?
17. Write a function that takes a sentence as an input parameter and replaces the first letter of every word with the corresponding upper case letter and the rest of the letters inthe word by corresponding letters in lowercase without using a built-in function?
18. Writesarecursivefunctionthatgeneratesallbinarystringsofn-bitlength
19. Writeapythonprogramthatdefines amatrixandprints
20. Writeapythonprogram toperformmultiplicationoftwosquarematrices
21. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.
22. Usethestructureofexceptionhandlingallgeneral-purposeexceptions.
23. Writeafunctioncalleddraw_rectanglethattakesaCanvasandaRectangleasarguments and draws a representation of the Rectangle on the Canvas.
24. Add an attribute named color to your Rectangle objects and modify draw_rectangle so that it uses the color attribute as the fill color.
25. Writeafunctioncalled draw_point that takesaCanvasanda Point asargumentsand drawsa representation of the Point on the Canvas.
26. DefineanewclasscalledCirclewithappropriateattributesandinstantiateafew
27. Circle objects. Write a function called draw_circle that draws circles on the canvas.
28. Writeapythoncodetoreadaphonenumberandemail-idfromtheuserandvalidateitfor correctness.
29. WriteaPythoncode tomergetwogivenfilecontents intoa thirdfile.
30. WriteaPythoncodetoopenagivenfileandconstructafunctiontocheckforgivenwords present in it and display on found.
31. WriteaPythoncodetoReadtextfromatextfile,findthewordwithmostnumberofoccurrences
32. Writeafunctionthatreadsafile*file1*anddisplaysthenumberofwords,numberofvowels, blank spaces, lower case letters and uppercase letters.
33. Importnumpy,PlotpyandScipyandexploretheir functionalities.
34. InstallNumPypackagewithpipandexploreit.
35. WriteaprogramtoimplementDigital LogicGates-AND,OR, NOT,EX-OR
36. Write a GUI program to create a window wizard having two text labels, two text fields and two buttons as Submit and Reset.

TEXTBOOKS:
1. SuperchargedPython:Takeyourcodetothenextlevel,Overland
2. LearningPython,MarkLutz,O'reilly

REFERENCEBOOKS:
1. PythonProgramming:AModernApproach,VamsiKurama,Pearson
2. PythonProgrammingAModularApproachwithGraphics,Database,Mobile,andWeb Applications, SheetalTaneja, Naveen Kumar, Pearson
3. IntroductiontoPythonProgramming,GowrishakarS,VeenaA,CRCPress
4. ProgrammingwithPython,AUser'sBook,MichaelDawson,CengageLearning,IndiaEdition
5. PythonforDataScience,Dr.MohdAbdulHameed,Wileypublications
6. CorePythonProgramming,Dr.R.NageswaraRao,Dreamtechpress
7. IntroductiontoPython,GowrishankarS,VeenaA.,CRCPress