ACADEMIC REGULATIONS, PROGRAM STRUCTURE & DETAILED SYLLABUS

For

Undergraduate Programmee (B. Tech)

Information Technology

(Applicable for batches admitted from 2023-24)

VIGNAN'S INSTITUTE OF ENGINEERING FOR WOMEN (A)

Accredited by NBA for UG Programmes of EEE, ECE, CSE & IT

Accredited by NAAC with A+ Grade (CGPA of 3.49/4.00

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B.TECH.-IT–COURSESTRUCTURE–VR23

	IYearISemester						
S.No.	**Course Code**	**Category**	**CourseName**	**L**	**T**	**P**	**Credits**
1.	1000231101	BS	Linear Algebra &Calculus	3	0	0	3
2.	1003231102	ES	EngineeringGraphics	3	0	0	3
3.	1000231104	BS	Chemistry	3	0	0	3
4.	1003231101	ES	BasicCivil&MechanicalEngineering	3	0	3	3
5.	1005231101	ES	IntroductiontoProgramming	3	0	0	3
6.	1000231112	BS	ChemistryLab	0	0	2	1
7.	1005231110	ES	ComputerProgrammingLab	0	0	3	1.5
8.	1003231110	ES	EngineeringWorkshop	0	0	2	1.5
9.	1000231120	MC	HealthandWellness,YogaandSports	0	0	1	0.5
TotalCredits							**19.5**

	IYearIISemester						
S.No.	**Course Code**	**Category**	**CourseName**	**L**	**T**	**P**	**Credits**
1.	1000231201	BS	DifferentialEquationsandVectorcalculus	3	1	0	3
2.	1000231102	BS	EngineeringPhysics	3	0	0	3
3.	1000231103	HS	CommunicativeEnglish	2	0	0	2
4.	1002231101	ES	BasicElectrical&Electronics Engineering	3	0	0	3
5.	1005231201	PC	DataStructures	3	0	0	3
6.	1000231111	BS	EngineeringPhysicsLab	0	0	2	1
7.	1002231110	ES	Electrical&ElectronicsEngineering workshop	0	0	3	1.5
8.	1005231210	PC	DataStructuresLab	0	0	3	1.5
9.	1012231110	ES	IT Workshop	0	0	2	1
10.	1000231110	HC	CommunicativeEnglishLab	0	0	2	1
11.	1000231121	MC	NSS/NCC/Scouts&Guides/Community Service	0	0	1	0.5
TotalCredits							**20.5**

I-I SEMESTER SYLLABUS

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IYear–ISemester		L	T	P	C
Course Code(1000231101**)**	**LINEARALGEBRA&CALCULUS (CommontoAllBranchesofEngineering)**	**3**	**0**	**0**	**3**

CourseObjectives:
Toequipthestudentswithstandardconceptsandtoolsofmathematicstohandlevariousreal-worldproblems andtheirapplications.

CourseOutcomes: Attheendofthecourse,thestudentwillbeableto

- Developmatrixalgebratechniquesthatisneededbyengineersforpracticalapplications.
- Familiarizewithfunctionsofseveralvariableswhichisusefulinoptimization.
- Learnimportant toolsofcalculusinhigherdimensions.
- Familiarize with double and tripleintegrals of functions of several variable sin twoandthreedimensions.

UNITIMatrices
Rank of a matrix by echelon form, normal form. Inverse of Non- singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-HomogeneousequationsbyGausseliminationmethod,GaussSeidelIterationMethod.

UNITIIILinearTransformationandOrthogonalTransformation:
Eigen values, Eigen vectors and their properties (without proof), Diagonalization of amatrix,Cayley-HamiltonTheorem(withoutproof), findinginverseandpowerofamatrixby Cayley -Hamilton Theorem, Quadratic forms and Nature of the Quadratic Forms,ReductionofQuadraticformtocanonicalforms byOrthogonalTransformation.

UNITIIIMeanValueTheorems
Rolle's Theorem, Lagrange's mean value theorem with their geometrical interpretation,Cauchy'smeanvaluetheorem,
Taylor'sandMaclaurintheoremswithremainders(withoutproof),problems onthe abovetheorems.

UNITIVPartialdifferentiationandApplications
Partial derivatives, total derivatives, chain rule, change of variables, Taylor's and Maclaurin'sseries expansion of functions of two variables. Jacobians, maxima and minima of functions oftwovariables,methodofLagrangemultipliers.

UNITVMultipleIntegrals
Double integrals, triple integrals, change of order of integration, change of variables topolarcoordinates.Finding areas andvolumesinCartesiancoordinates.

Textbooks:

1. B.S.Grewal,HigherEngineeringMathematics,44/KhannaPublishers,2017.
2. ErwinKreyszig, AdvancedEngineeringMathematics,10/e,JohnWiley&Sons, 2018.

ReferenceBooks:

1. R.K.Jain and S.R.K.Iyengar,Advanced EngineeringMathematics,5/e,Alpha ScienceInternationalLtd.,2021(9threprint).
2. GeorgeThomas, MauriceD.WeirandJoelHass, ThomasCalculus, 14/e,PearsonPublishers,2018.
3. GlynJames, AdvancedModernEngineeringMathematics, 5/e,Pearsonpublishers, 2018.
4. MichaelGreenberg,AdvancedEngineeringMathematics,9thedition,Pearsonedn
5. H.KDas,Er. RajnishVerma,HigherEngineeringMathematics,S.Chand,2021

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IYear–ISemester		L	T	P	C
CourseCode (1003231102**)**	**ENGINEERINGGRAPHICS** (CommontoAllbranchesofEngineering)	**1**	**0**	**4**	**3**

CourseObjectives:

- Toenablethestudentswithvariousconceptslikedimensioning,conventionsandstandardsrelatedtoEngineeringDrawing
- Toimpartknowledgeontheprojectionofpoints,linesandplanesurfaces
- Toimprovethevisualizationskillsforbetterunderstandingofprojectionofsolids
- TodeveloptheimaginativeskillsofthestudentsrequiredtounderstandSectionofsolidsandDevelopments ofsurfaces.
- Tomakethestudentsunderstandtheviewingperceptionofasolidobjectin Isometric andPerspectiveprojections.

CourseOutcomes:

CO1:Understandtheprinciplesofengineeringdrawing,includingengineeringcurves,scales,orthographicandisometricprojections.
CO2: Draw and interpret orthographic projections of points, lines, planes andsolidsInfront,topandsideviews.
CO3: Understand and draw projection of solids in various positionsin first quadrant.CO4:Explain principlesbehinddevelopmentofsurfaces.
CO5:Prepareisometricandperspectivesectionsofsimplesolids.

UNITI

Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions andConstructingregularpolygonsbygeneralmethods.

Curves: construction of ellipse, parabola and hyperbola by general, Cycloids, Involutes,NormalandtangenttoCurves.

Scales: Plainscales,diagonalscalesandvernierscales.

UNITII

OrthographicProjections:Referenceplane,importanceofreferencelinesorPlane,Projection sofapointsituatedinanyoneofthefourquadrants.

ProjectionsofStraightLines: Projectionsofstraightlinesparalleltobothreferenceplanes,perpendiculartoonereference planeandparalleltootherreferenceplane,inclined

toonereferenceplaneandparalleltotheotherreferenceplane.ProjectionsofStraightLineInclinedtobot hthereferenceplanes.

ProjectionsofPlanes: RegularplanesPerpendiculartobothreferenceplanes, paralleltoonereferenceplane andinclinedtotheotherreferenceplane.

UNITIII

Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections ofsolids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular tovertical plane and Axis parallel to both the reference planes, Projection of Solids with axisinclinedtoonereferenceplaneandparalleltoanotherplane.

UNITIV

Sections of Solids: Perpendicular and inclined section planes, Sectional views and Trueshapeofsection,Sections ofsolidsinsimplepositiononly.

DevelopmentofSurfaces: MethodsofDevelopment:Parallellinedevelopment andradiallinedevelopment.Developmentofacube,prism,cylinder,pyramidandcone.

UNITV

Conversion of Views: Conversion of isometric views to orthographic views; Conversionoforthographicviewstoisometricviews.

Computergraphics:Creating2D&3DdrawingsofobjectsincludingPCBandTransformations usingAutoCAD (*Notforendexamination*).

Textbook:

1.N.D.Bhatt,EngineeringDrawing,CharotarPublishingHouse, 2016.

ReferenceBooks:

1. EngineeringDrawing,K.L.NarayanaandP.Kannaiah,TataMcGrawHill,2013.
2. EngineeringDrawing,M.B.ShahandB.C.Rana,PearsonEducationInc,2009.
3. EngineeringDrawingwithanIntroductiontoAutoCAD, DhananjayJolhe,TataMcGraw Hill,2017.

I Year – ISemesters		L	T	P	C
Course Code(100023 1104)	**Chemistry (CommontoEEE,ECE,CSE,IT&alliedbranches)**	3	0	0	3

Courseobjectives:

- Tofamiliarizeengineeringchemistryanditsapplications
- Totrainthestudentsontheprinciplesandapplicationsofelectrochemistryandpolymers
- Tointroduceinstrumentalmethods,molecularmachinesandswitches.

CourseOutcomes: Attheendofthecourse,thestudentswillbeableto:

CO1: Comparethematerialsofconstruction forbatteryandelectrochemicalsensors.
CO2: Explain the preparation, properties, and applications of thermoplastics &thermosetting&elastomersconductingpolymers.
CO3:Explaintheprinciplesofspectrometry,slcinseparationofsolidandliquidmixtures.
CO4: ApplytheprincipleofBanddiagramsintheapplicationofconductorsandsemiconductors.
CO5: SummarizetheconceptsofInstrumentalmethods.

UNITI

StructureandBondingModels

Fundamentals of Quantum mechanics, Schrodinger Wave equation, significance of Ψ and Ψ2,particle in one dimensional box, molecular orbital theory – bonding in homo- and heteronucleardiatomic molecules – energy level diagrams of O2 and CO, etc. π-molecular orbitals ofbutadiene andbenzene,calculationofbondorder.

UNIT-II

ModernEngineeringmaterials

Semiconductors – Introduction, basic concept, application Super conductors-Introduction basicconcept, applications. Supercapacitors: Introduction, Basic Concept-Classification – Applications.Nanomaterials:Introduction,classification,propertiesandapplicationsofFullerenes,carbonnanotubes andGraphinesnanoparticles.

UNIT-III

ElectrochemistryandApplications

Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, potentiometry-potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometrictitrations(acid-basetitrations).

Electrochemicalsensors–potentiometricsensorswithexamples, amperometricsensorswith examples.

Primary cells – Zinc-air battery, Secondary cells –lithium-ion batteries- working of the batteriesincludingcellreactions;Fuelcells,hydrogen-oxygenfuelcell–workingofthecells. PolymerElectrolyteMembraneFuelcells(PEMFC).

UNIT-IV

PolymerChemistry

Introduction to polymers, functionality of monomers, chain growth and step growth polymerization,coordinationpolymerization,withspecificexamplesandmechanismsofpolymerformation.

Plastics –Thermo and Thermosetting plastics, Preparation, properties and applications of –PVC,Teflon,Bakelite,Nylon-6,6,carbonfibres.

Elastomers–Buna-S,Buna-N–preparation,propertiesandapplications.

Conductingpolymers–polyacetylene,polyaniline,–mechanismofconductionandapplications.Bio-Degradable polymers-PolyGlycolicAcid(PGA),PolylLacticAcid(PLA).

UNIT-V

InstrumentalMethodsand Applications

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. UV-Visible Spectroscopy,electronic transition, Instrumentation, IR spectroscopies, fundamental modes and selection rules,Instrumentation. Chromatography-Basic Principle, Classification-HPLC: Principle, InstrumentationandApplications.

Textbooks:

1. JainandJain,EngineeringChemistry,16/e,DhanpatRai,2013.
2. PeterAtkins,JuliodePaulaandJamesKeeler,Atkins'PhysicalChemistry,10/e,OxfordUniversityPress, 2010.

ReferenceBooks:

1. SkoogandWest,PrinciplesofInstrumentalAnalysis,6/e,Thomson,2007.
2. J.D.Lee,ConciseInorganicChemistry,5thEdition,WileyPublications,Feb.2008
3. TextbookofPolymerScience,FredW.BillmayerJr,3rdEdition

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IYear–ISemester		L	T	P	C
Course Code(100323 1101**)**	**BASICCIVIL&MECHANICALENGINEERING (CommontoCE,ME,IT, CSE,CSE(DS),CSE(CS),CSE(AI)**	**3**	**0**	**0**	**3**

CourseObjectives:

- GetfamiliarizedwiththescopeandimportanceofCivilEngineeringsub-divisions.
- Introducethepreliminaryconceptsofsurveying.
- Acquirepreliminaryknowledgeon
- Transportationanditsimportanceinnation'economy.
- Getfamiliarizedwiththeimportanceofquality,conveyanceandstorageofwater.
- Introductiontobasiccivilengineeringmaterialsandconstructiontechniques.

CourseOutcomes: Oncompletion ofthecourse,thestudentshouldbeableto:

CO1:Understandvarioussub-divisionsofCivilEngineeringandtoappreciatetheirroleinensuringbettersociety.

CO2:Knowtheconceptsofsurveyingandto understandthemeasurementofdistances,anglesandlevels throughsurveying.

CO3: Realize the importance of Transportation in nation 's economy and the engineeringmeasuresrelatedtoTransportation.

CO4:UnderstandtheimportanceofWaterStorageandConveyanceStructuressothatthesocialresponsibilitiesofwaterconservationwillbeappreciated.

CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledgeonprefabricatedtechnology.

UNITI

Basics of Civil Engineering: Role of Civil Engineers in Society- Various Disciplines of CivilEngineering-StructuralEngineering-Geo-technicalEngineering-TransportationEngineering -HydraulicsandWaterResourcesEngineering-EnvironmentalEngineering-Scopeofeachdiscipline-BuildingConstructionandPlanning–ConstructionMaterials-Cement–Aggregate –Bricks–Cementconcrete-Steel.IntroductiontoPrefabricated constructionTechniques.

UNITII

Surveying: Objectives of Surveying - Horizontal Measurements – Angular Measurements-IntroductiontoBearingslevelinginstrumentsusedforlevelling-Simpleproblemsonlevelingandbearings-Contour mapping.

UNITIII

Transportation Engineering Importance of Transportation in Nation's economicdevelopment-TypesofHighwayPavements-FlexiblePavementsandRigidPavements-SimpleDifferences.BasicsofHarbour,Tunnel,Airport,andRailwayEngineering

Water Resources and Environmental Engineering: Introduction, Sources of water-Qualityof water- Specifications- Introduction to Hydrology– Rain water Harvesting-Water StorageandConveyanceStructures(SimpleintroductiontoDamsandReservoirs).

Textbooks:

1. Basic Civil Engineering, M. S. Palanisamy, , Tata Mcgraw Hill publications (India) Pvt.Ltd.FourthEdition.
2. IntroductiontoCivilEngineering,S.S.Bhavikatti,NewAgeInternationalPublishers.2022 .FirstEdition.
3. BasicCivilEngineering,SatheeshGopi,PearsonPublications,2009,FirstEdition.

ReferenceBooks:

1. Surveying,Vol-IandVol-II,S.K.Duggal,TataMcGrawHillPublishers2019.FifthEdition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers,Delhi.2016
3. IrrigationEngineeringandHydraulicStructures-SantoshKumarGarg,KhannaPublishers,Delhi2023.38thEdition.
4. Highway Engineering, S. K. Khanna, C.E.G. Justoand Veeraraghavan, NemchandandBrothersPublications2019.10thEdition.
5. IndianStandardDRINKINGWATER—SPECIFICATIONIS10500-2012.

PARTB:BASICMECHANICALENGINEERING

CourseObjectives: Thestudentsaftercompletingthecourseareexpectedto

- Getfamiliarizedwiththescopeandimportanceof MechanicalEngineeringindifferentsectorsandindustries.
- Explaindifferentengineeringmaterialsanddifferentmanufacturing processes.
- Provideanoverviewofdifferentthermalandmechanicaltransmissionsystemsandintroducebasics ofrobotics andits applications.

CourseOutcomes: Oncompletionofthecourse,thestudentshouldbeabletoCO1: Understandthe differentmanufacturingprocesses.
CO2:Explainthebasicsofthermalengineeringanditsapplications.
CO3: Describe the working of different mechanical power transmission systems andpowerplants
CO4:Describethebasicsofroboticsanditsapplications.

UNITI

Introduction to Mechanical Engineering: Role of Mechanical Engineering in IndustriesandSociety-Technologiesindifferentsectorssuchas Energy,Manufacturing,Automotive,Aerospace,andMarinesectors.
EngineeringMaterials-Metals-FerrousandNon-ferrous,Ceramics,Composites,Smartmaterials.

UNITII

Manufacturing Processes : Principles of Casting**,** Forming, joining processes,Machining,Introductionto CNCmachines,3Dprinting,andSmart manufacturing.**ThermalEngineering**–workingprincipleofBoilers,Ottocycle,Dieselcycle, Refrigeration and air-conditioning cycles, IC engines, 2-Stroke and 4-Stroke engines,SI/CIEngines,ComponentsofElectricandHybridVehicles.

UNITIII

Power plants – working principle of Steam, Diesel, Hydro, Nuclear power plants.**Mechanical Power Transmission -** Belt Drives, Chain, Rope drives, Gear Drivesandtheirapplications.
IntroductiontoRobotics-Joints&links,configurations,andapplicationso frobotics.(
Note: The subject covers only the basic principles of Civil and MechanicalEngineeringsystems.Theevaluationshall beintendedtotest onlythefundamentals
ofthesubject)

Textbooks:

1. InternalCombustionEnginesbyV.Ganesan,ByTataMcGrawHillpublications(India)Pvt.Ltd.
2. ATearbookofTheoryofMachinesbyS.S.Rattan,TataMcGrawHillPublicatio ns,(India)Pvt.Ltd.
3. Anintroduction toMechanicalEnggbyJonathanWickerandKemperLewis,CengagelearningIndia Pvt.Ltd.

ReferenceBooks:

1. AppuuKuttanKK,Robotics,I.K.InternationalPublishingHousePvt.Ltd.Volume-I
2. 3Dprinting&AdditiveManufacturingTechnology-L.JyothishKumar,PulakM Pandey,Springerpublications
3. ThermalEngineeringbyMaheshMRathoreTataMcGrawHillpublications(India)Pvt.L td.
4. G.Shanmugam and M.S.Palanisamy, Basic Civil and the MechanicalEngineering,TataMcGrawHillpublications(India)Pvt.Ltd.

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IYear–ISemester		L	T	P	C
CourseCode: (1005231101)	**INTRODUCTIONTOPROGRAMMING (CommontoAllbranchesofEngineering)**	**3**	**0**	**0**	**3**

CourseObjectives:

Theobjectivesofthiscourseistoacquireknowledge onthe

i. Toimpartadequateknowledgeontheneedofprogramminglanguagesandproblem-solvingtechniquesanddevelopprogrammingskills.
ii. ToenableeffectiveusageofControlStructuresandImplementdifferentoperationsonarrays.
iii. TodemonstratetheuseofStringsandFunctions.
iv. To impart the knowledge of pointers and understand the principles of dynamicmemoryallocation.
v. Tounderstandstructuresandunionsandillustratethefileconceptsanditsoperations.
vi. ToimparttheKnowledgeSearchingandSortingTechniques

UNIT-IIntroductiontoComputerProblemSolving:
Programs and Algorithms, Computer Problem Solving Requirements, Phases of ProblemSolving, Problem. Solving Strategies, Top-Down Approach, Algorithm Designing,ProgramVerification,ImprovingEfficiency,AlgorithmAnalysisand Notations.

UNIT-IIIntroductiontoCProgramming:
Introduction, Structure of a C Program. Comments, Keywords, Identifiers, Data Types,Variables, Constants, Input/output Statements. Operators, Type Conversion. Control Flow,Relational Expressions: Conditional Branching Statements: if, if-else, if-else—if, switch.BasicLoopStructures:while,do-while loops, forloop, nestedloops,TheBreakandContinueStatements,gotostatement.

UNIT-IIIArrays:
Introduction,OperationsonArrays,ArraysasFunctionArguments,TwoDimensionalArrays,Multidimensional Arrays. Pointers: Concept of a Pointer, Declaring and Initializing PointerVariables, Pointer Expressions and Address Arithmetic, Null Pointers, Generic Pointers,Pointersas Function Arguments, Pointers and Arrays, Pointer to Pointer, Dynamic MemoryAllocation,DanglingPointer,CommandLineArguments.

UNIT-IVFunctions:
Introduction Function : Declaration, Function Definition, Function Call, Categories ofFunctions,Passing Parameters to Functions, Scope of Variables, Variable Storage Classes.Recursion.
Strings:String Fundamentals,StringProcessingwithandwithout LibraryFunctions,PointersandStrings.

UNIT-V
Structures,Unions,BitFields:Introduction,NestedStructures,ArraysofStructures,Structures

and Functions, Self-Referential Structures, Unions, Enumerated Data Type —Enum variables,Using Typedef keyword, Bit Fields. Data Files: Introduction to Files, Using Files in C,ReadingfromTextFiles,WritingtoTextFiles,RandomFileAccess.

Note: Thesyllabusisdesigned withCLanguage asthefundamentallanguage ofimplementation**.**

CourseOutcomes:

AttheendoftheCourse,Studentshouldbeableto:

i . Illustrate the Fundamental concepts of Computers and basics of computer programmingandproblem-solvingapproach

ii. Understand theControlStructures,branchingandloopingstatements

iii. UseofArraysandPointers insolvingcomplexproblems.

iv. DevelopModularprogramaspectsandStringsfundamentals.

v. Demonstrate the ideas of User Defined Data types, files. Solve real world problems usingtheconceptofStructures,UnionsandFileoperations.

TextBooks:

1. AStructuredProgrammingApproachUsingC,Forouzan,Gilberg,Cengage.
2. HowtosolveitbyComputer,R.G.Dromey,andPearsonEducation.
3. ProgrammingInCA-Practia1Approach.AjayMittal,Pearson

References:

1. ByronGottfried,Schaum'sOutlineofProgramming withC,McGraw-Hill.
2. ComputerProgramming.ReemaThareja,OxfordUniversityPress
3. TheCProgrammingLanguage,DennisRichieAndBrianKernighan,PearsonEducation.
4. ProgrammingInC,AshokKamthane,SecondEdition,PearsonPublication.
5. LetusC,YaswanthKanetkar,16thEdition,BPBPublication.
6.Computing fundamentals and C Programming, Balagurusamy, E., McGraw-HillEducation,2008

WebReferences:

1. http://www.c4learn.com/
2. http://www.geeksforgeeks.org/c/
3. http://nptel.ac.in/courses/122104019/
4. http://www.learn-c.org/
5. https://www.tutorialspoint.com/cprogramming/

I Year – ISemesters		**L**	**T**	**P**	**C**
Course Code(100023 1112)	**ChemistryLaboratory (CommontoEEE, ECE,CSE,IT&alliedbranches)**	**0**	**0**	**2**	**1**

CourseObjectives:

- Verifythefundamentalconceptswithexperiments.

CourseOutcomes: Attheendofthecourse,thestudents willbeabletoCO1: Determinethecellconstantand conductanceofsolutions.

CO2:Prepareadvancedpolymer Bakelitematerials.

CO3: Measure the strength of an acid present in secondary

batteries.CO4:AnalyzetheIR spectraofsomeorganiccompounds.

CO5:CalculatestrengthofacidinPb-Acidbattery.

Listofexperiments:

1. Measurementof10Dqbyspectrophotometricmethod
2. Conductometrictitrationofstrongacidvs.strongbase
3. Conductometrictitrationofweakacidvs.strongbase
4. Determinationofcellconstantandconductanceofsolutions
5. Potentiometry-determinationofredoxpotentialsandemfs
6. DeterminationofStrengthofanacidinPb-Acidbattery
7. PreparationofaBakelite
8. VerifyLambert-Beer'slaw
9. Wavelength measurementofsamplethroughUV-VisibleSpectroscopy
10. IdentificationofsimpleorganiccompoundsbyIR
11. Preparationofnanomaterialsbyprecipitationmethod
12. EstimationofFerrousIronbyDichrometry

Reference:

- "Vogel's QuantitativeChemicalAnalysis 6thEdition6thEdition"PearsonPublications byJ.Mendham,R.C.Denney, J.D.Barnesand B.Sivasankar

IYear– ISemester		L	T	P	C
CourseCode (1005231110)	**COMPUTERPROGRAMMINGLAB** **(Commonto AllbranchesofEngineering)**	**0**	**0**	**3**	**1.5**

CourseObjectives:

Thecourseaimstogivestudentshands–onexperienceandtrainthemontheconceptsoftheC-programminglanguage.

CourseOutcomes:
CO1:Read,understand,and tracetheexecutionofprogramswritteninClanguage.CO2:Selecttherightcontrolstructurefor solvingtheproblem.
CO3:DevelopCprogramswhichutilizememoryefficientlyusingprogramming constructslikepointers.
CO4: Develop, Debug and Execute programs to demonstrate the applications of arrays,functions,basicconcepts ofpointersinC.

UNIT

IWEEK1
Objective: Gettingfamiliar with the programming environment on the computer and writingthefirstprogram.

SuggestedExperiments/Activities:
Tutorial1: Problem-solvingusingComputers.
Lab1: Familiarizationwithprogrammingenvironment

i) BasicLinuxenvironmentanditseditorslikeVi,Vim&Emacsetc.
ii) ExposuretoTurboC,gcc
iii) Writingsimpleprogramsusingprintf(),scanf()

WEEK2
Objective: Gettingfamiliarwithhowtoformallydescribeasolutiontoaprobleminaseriesoffinitest epsbothusingtextualnotationandgraphicnotation.

SuggestedExperiments/Activities:
Tutorial2: Problem-solvingusingAlgorithmsandFlowcharts.
Lab1: Convertingalgorithms/flow chartsintoCSourcecode.
Developingthealgorithms/flowchartsforthefollowingsampleprograms

i) Sumandaverageof3numbers
ii) ConversionofFahrenheittoCelsiusandviceversa
iii) Simpleinterestcalculation

WEEK3
Objective:Learnhowtodefinevariableswiththedesireddata-type,initializethemwithappropriatevaluesandhowarithmetic operatorscanbeusedwithvariablesandconstants.

SuggestedExperiments/Activities:
Tutorial3: Variabletypesandtypeconversions:

Lab3: Simplecomputationalproblemsusingarithmeticexpressions.
i) Findingthesquareroot ofagivennumber
ii) Findingcompoundinterest
iii) Areaofa triangleusingheron'sformulae
iv) Distance travelledbyanobject

UNIT

IIWEEK4
Objective: Explore the full scope of expressions, type-compatibility of variables & constantsandoperators usedintheexpressionandhowoperator precedenceworks.

SuggestedExperiments/Activities:

Tutorial4: Operatorsandtheprecedenceandasassociativity:
Lab4: Simplecomputationalproblemsusingtheoperator'precedenceandassociativity
i) Evaluatethefollowingexpressions.
   a. A+B*C+(D*E)+F*G
   b. A/B*C-B+A*D/3
   c.A+++B---A
   d.J=(i++) +(++i)
ii) Findthemaximumofthreenumbersusingconditionaloperator
iii) Takemarksof5subjectsinintegers,andfindthetotal,averageinfloat

WEEK5
Objective: Explorethefullscopeofdifferentvariantsof–ifconstruct‖namelyif-else,null- else, if-else if*-else, switch and nested-if including in what scenario each one of them can beusedandhowtousethem.Exploreallrelationalandlogicaloperatorswhilewritingconditionalsfor –ifconstruct‖.

SuggestedExperiments/Activities:
Tutorial5: Branching andlogicalexpressions:
Lab5:Problemsinvolvingif-then-elsestructures.
i) WriteaCprogramtofindthemaxandminoffour numbersusingif-else.
ii) WriteaCprogramtogenerateelectricitybill.
iii) Findtherootsofthequadraticequation.
iv) WriteaCprogramtosimulateacalculatorusingswitchcase.
v) WriteaCprogramtofindthegivenyearisaleapyear or not.

WEEK6

Objective: Explorethefullscopeofiterativeconstructsnamelywhileloop,do-whileloopand for loop in addition to structured jump constructs like break and continue including when eachofthesestatementsismoreappropriatetouse.

SuggestedExperiments/Activities:

Tutorial6: Loops,whileandforloops

Lab6: Iterativeproblemse.g.,thesumofseries

i) Findthefactorialofgivennumberusinganyloop.
ii) Findthegivennumberisaprimeornot.
iii) Computesineandcosseries
iv) Checkinganumberpalindrome
v) Constructapyramidofnumbers.

UNIT

IIIWEEK7:

Objective: ExplorethefullscopeofArraysconstructnamelydefiningandinitializing1-Dand2-D and more generically n-D arrays and referencing individual array elements from thedefinedarray.Usinginteger1-Darrays,exploresearchsolutionlinearsearch.

SuggestedExperiments/Activities:

Tutorial7:1DArrays:searching.

Lab7:1D Arraymanipulation,linearsearch

i) Findtheminandmaxofa1-Dintegerarray.
ii) Performlinearsearchon1Darray.
iii) Thereverseofa1Dintegerarray
iv) Find2'scomplementofthegivenbinarynumber.
v) Eliminateduplicateelementsinanarray.

WEEK8:

Objective: Explore the difference between other arrays and character arrays that can be usedas Strings by using null character and get comfortable with string by doing experiments thatwill reverse a string and concatenate two strings. Explore sorting solution bubble sort usingintegerarrays.

SuggestedExperiments/Activities:

Tutorial8:2Darrays,sorting andStrings.

Lab8: Matrixproblems,Stringoperations,Bubblesort

i) Additionoftwomatrices
ii) Multiplicationtwomatrices
iii) Sortarrayelementsusingbubblesort
iv) Concatenatetwostringswithoutbuilt-infunctions
v) Reverseastringusing built-inandwithoutbuilt-instringfunctions

UNITIV

WEEK9:
Objective: Explorepointers tomanageadynamicarray of integers,includingmemoryallocation value initialization, resizing changing and reordering the contents of an array andmemory de-allocationusingmalloc(),calloc(),realloc()andfree()functions.Gainexperienceprocessingcomma nd-line arguments receivedbyC

SuggestedExperiments/Activities:
Tutorial9: Pointers,structuresanddynamicmemoryallocation
Lab9: Pointersandstructures,memorydereference.

i) WriteaCprogramtofindthesumofa1Darrayusingmalloc()
ii) WriteaCprogramtofindthetotal,averageofnstudentsusingstructures
iii) Enternstudentsdatausingcalloc()anddisplayfailedstudentslist
iv) Readstudentnameandmarksfromthecommandlineanddisplaythestudentdetailsalongwiththet otal.
v) WriteaCprogramtoimplementrealloc()

WEEK10:
Objective: Experiment with C Structures, Unions, bit fields and self-referential structures(Singlylinkedlists)andnestedstructures

SuggestedExperiments/Activities:
Tutorial10: Bitfields,Self-ReferentialStructures,Linkedlists
Lab10: Bitfields,linkedlists
Read and printa date usingdd/mm/yyyy formatusingbit-fields and differentiate thesamewithoutusingbit-fields

i) Createanddisplayasinglylinkedlistusingself-referentialstructure.
ii) Demonstratethedifferencesbetweenstructuresandunionsusing aCprogram.
iii) WriteaCprogramtoshift/rotateusingbitfields.
iv) WriteaCprogramtocopyonestructurevariabletoanotherstructureofthesametype.

UNIT

VWEEK 11:
Objective: ExploretheFunctions,sub-routines,scopeandextentofvariables,doingsomeexperimentsbyparameterpassingusingcallbyval ue.Basicmethodsofnumericalintegration

SuggestedExperiments/Activities:
Tutorial11: Functions,callbyvalue,scopeandextent,
Lab 11: Simple functions using call by value, solving differential equations using Eulerstheorem.

i) WriteaCfunctionto calculateNCRvalue.
ii) WriteaCfunctiontofindthelengthofastring.
iii) WriteaCfunctiontotransposeofamatrix.
iv) WriteaCfunctiontodemonstrate numericalintegrationofdifferentialequationsusingEuler'smethod

WEEK12:
Objective: Explore how recursive solutions can be programmed bywriting recursive functions that can be invoked from the main by programming at-least five distinct problems that havenaturallyrecursivesolutions.

SuggestedExperiments/Activities:
Tutorial12: Recursion,thestructureofrecursivecalls
Lab12: Recursivefunctions

i) WritearecursivefunctiontogenerateFibonacciseries.
ii) Writearecursivefunctiontofindthelcmoftwonumbers.
iii) Writearecursivefunctiontofindthefactorialofanumber.
iv) WriteaCProgramtoimplementAckermannfunctionusingrecursion.
v) Writearecursivefunctiontofindthesumofseries.

WEEK13:
Objective: Explorethebasicdifferencebetweennormalandpointervariables,Arithmeticoperation susingpointers andpassingvariables tofunctionsusingpointers

SuggestedExperiments/Activities:
Tutorial13: Callbyreference,danglingpointers
Lab13: SimplefunctionsusingCallbyreference,Danglingpointers.

i) WriteaCprogramtoswaptwonumbers usingcallbyreference.
ii) Demonstrate DanglingpointerproblemusingaCprogram.
iii) WriteaCprogramtocopyonestringintoanotherusingpointer.
iv) WriteaCprogram tofindnooflowercase,uppercase,digitsandothercharactersusingpointers.

WEEK14:
Objective: Tounderstanddatafilesandfilehandlingwithvariousfile I/Ofunctions.Explorethediffer encesbetweentextandbinaryfiles.

SuggestedExperiments/Activities:
Tutorial14: Filehandling
Lab14: Fileoperations

i) WriteaCprogramtowriteandreadtextintoafile.
ii) WriteaCprogramtowriteandreadtextintoabinaryfileusingfread()andfwrite()
iii) Copythecontentsofonefiletoanotherfile.
iv) WriteaCprogramtomergetwofilesintothethirdfileusingcommand-linearguments.
v) Findno.oflines,wordsandcharactersinafile
vi) WriteaCprogramtoprintlastncharactersofagivenfile.

Textbooks:

1. AjayMittal,ProgramminginC:Apracticalapproach,Pearson.
2. ByronGottfried,Schaum'sOutlineofProgrammingwithC,McGrawHill

ReferenceBooks:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice-HallofIndia

CProgramming,AProblem-Solving Approach,Forouzan,Gilberg,Prasad,CENGAGE

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IYear–ISemester		L	T	P	C
Course Code:(1003231110)	**ENGINEERINGWORKSHOP** (CommontoAllbranchesofEngineering)	**0**	**0**	**3**	**1.5**

CourseObjectives:

To familiarize students with wood working, sheet metal operations, fitting and electrical housewiringskills

CourseOutcomes:

CO1:Identifyworkshoptoolsandtheiroperationalcapabilities.
CO2:Practiceonmanufacturingofcomponentsusingworkshoptradesincluding fitting,carpentry,foundryandwelding.
CO3:Applyfitting operationsinvariousapplications.
CO4:ApplybasicelectricalengineeringknowledgeforHouseWiringPractice

SYLLABUS

1. **Demonstration**: Safetypracticesandprecautionstobeobservedinworkshop.
2. **WoodWorking:**Familiaritywithdifferenttypesofwoodsandtoolsusedinwoodworkingan dmakefollowingjoints.
   a) Half–Lapjoint b)MortiseandTenonjoint c)Corner DovetailjointorBridlejoint
3. **SheetMetalWorking**:Familiaritywithdifferenttypesoftoolsusedinsheetmetalworking, Developmentsoffollowingsheetmetaljobfrom GIsheets.
   a) Taperedtray b)Conicalfunnel c)Elbowpipe d)Brazing
4. **Fitting:**Familiaritywithdifferenttypesoftoolsusedinfittinganddothefollowingfittingexe rcises.
   a) V-fit b)Dovetailfit c)Semi-circularfit d) Bicycle tire punctureandchangeoftwo-wheelertyre
5. **ElectricalWiring**:Familiaritywithdifferenttypesofbasicelectricalcircuitsandmakethe followingconnections.
   a) Parallelandseries b)Two-wayswitch c)Godownlighting d)Tubelight e)Threephasemotor f)Solderingofwires
6. **FoundryTrade:**DemonstrationandpracticeonMouldingtools andprocesses,PreparationofGreenSandMouldsforgivenPatterns.
7. **WeldingShop**:Demonstration andpracticeonArcWeldingandGas welding.PreparationofLapjointandButtjoint.
8. **Plumbing:**DemonstrationandpracticeofPlumbingtools, PreparationofPipejointswithcouplingforsamediameterandwithreducerfordifferentdia meters.

Textbooks:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; IndependentlyPublished,2019. Workshop Processes, Practices and Materials; Bruce J. Black,Routledgepublishers,5thEdn.2015.
2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, DhanpathRai&Co.,2015&2017.

ReferenceBooks:

1. ElementsofWorkshopTechnology,Vol.IbyS.K.HajraChoudhury&Others ,MediaPromotersandPublishers,Mumbai.2007,14thedition
2. WorkshopPractice byH.S.Bawa,Tata-McGrawHill,2004.
3. Wiring Estimating, Costing and Contracting; SoniP.M. & UpadhyayP.A.;AtulPrakashan,2021-22.

IYear–ISemester		**L**	**T**	**P**	**C**
CourseCode (1000231120)	**HEALTHANDWELLNESS,YOGAANDSPORTS (CommontoAllbranchesofEngineering)**	**0**	**0**	**1**	**0.5**

CourseObjectives:

Themainobjectiveofintroducingthiscourseistomakethestudentsmaintaintheirmental andphysicalwellnessbybalancingemotionsintheir life.Itmainlyenhancestheessentialtraitsrequiredfor thedevelopmentofthepersonality.

Course Outcomes: Aftercompletionofthecoursethestudentwillbeableto
CO1:UnderstandtheimportanceofyogaandsportsforPhysicalfitnessandsoundhealth.
CO2: Demonstrate an understanding of health-related fitness components.**CO3:** Compare and contrast various activities that help enhance their health.**CO4:**Assesscurrentpersonalfitnesslevels.
CO5: DevelopPositivePersonality

UNITI

Conceptofhealthandfitness,NutritionandBalanceddiet,basicconceptofimmunity Relationship between diet and fitness, Globalization and its impact onhealth,BodyMass Index(BMI)ofallagegroups.

Activities:

i) Organizing healthawarenessprogrammesincommunity
ii) Preparationofhealthprofile
iii) Preparationofchartfor balancedietforallagegroups

UNITII

Concept of yoga, need for and importance of yoga, origin and history of yoga inIndian context, classification of yoga, Physiological effects of Asanas-Pranayamaandmeditation,stressmanagementandyoga,Mentalhealthandyogapractic e.

Activities:

Yogapractices–Asana,Kriya, Mudra,Bandha,Dhyana,SuryaNamaskar

UNITIII

ConceptofSportsandfitness,importance,fitnesscomponents,historyofsports,Ancientand ModernOlympics,AsiangamesandCommonwealthgames.

Activities:

i) Participation in one major game and one individual sport viz., Athletics,Volleyball, Basketball, Handball, Football, Badminton, Kabaddi, Kho-kho,Table tennis,Cricketetc.
Practicinggeneralandspecificwarmup,aerobics
ii) Practicingcardiorespiratoryfitness,treadmill,runtest,9minwalk,skippingandrunning.

ReferenceBooks:

1. GordonEdlin,EricGolanty.HealthandWellness,14thEdn.Jones&Bartlett Learning,2022
2. T.K.V.Desikachar.TheHeartofYoga:DevelopingaPersonalPractice
3. ArchieJ.Bahm.YogaSutrasofPatanjali,JainPublishingCompany,1993
4. Wiseman,JohnLofty, SAS Survival Handbook: TheUltimateGuidetoSurvivingAnywhereThirdEdition,WilliamMorrowPaperbacks,2014
5. TheSportsRulesBook/HumanKineticswithThomasHanlon.--3rded.HumanKinetics,Inc.2014

GeneralGuidelines:

1. InstitutesmustassignslotsintheTimetablefor theactivitiesofHealth/Sports/Yoga.
2. Institutes must provide field/facility and offer the minimum of fivechoices ofasmanyasGames/Sports.
3. Institutesarerequiredtoprovidesportsinstructor/yogateachertomentorthestudents.

EvaluationGuidelines:

- Evaluatedforatotalof100marks.
- A student can select 6 activities of his/her choice with a minimum of 01activity per unit. Each activity shall be evaluated by the concerned teacherfor15marks,totallingto90marks.
- A student shall be evaluated by the concerned teacher for 10 marks byconductingvivavoceonthe subject.

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I-II SEMESTER SYLLABUS

IYear–IISemester		L	T	P	C
Course Code :(1000231201)	**DIFFERENTIALEQUATIONSANDVECTOR CALCULUS (Common toAllBranchesofEngineering)**	**3**	**0**	**0**	**3**

CourseObjectives:

- Toenlightenthelearnersintheconceptofdifferentialequationsandmultivariablecalculus.
- Tofurnishthelearnerswithbasicconceptsand techniquesatplustwoleveltoleadthemintoadvancedlevelby handlingvariousreal-worldapplications.

CourseOutcomes: Attheendofthecourse,thestudentwillbeableto

- Solvethedifferentialequationsrelatedtovariousengineeringfields.
- Identifysolutionmethodsforpartialdifferentialequationsthatmodelphysicalprocesses.
- Interpretthephysicalmeaningofdifferentoperatorssuchasgradient,curlanddivergence.
- Estimatetheworkdoneagainstafield, circulationandfluxusingvectorcalculus.

UNIT I Differentialequationsoffirstorderandfirstdegree
Lineardifferentialequations–Bernoulli'sequations-
Exactequationsandequationsreducibletoexactform. Applications:Newton'sLawofcooling–Lawofnaturalgrowthanddecay-
Electrical
circuits.

UNIT II Higher order Linear differential equations with Constant Coefficients Definitions, homogenous and non-homogenous, complimentary function – particular
integral($Q(x)=e^{ax}$,sinax,cosax,x^m),generalsolution,methodofvariationofparameters.
Simultaneouslinearequations.

UNITIII PartialDifferentialEquations
IntroductionandformationofPartialDifferentialEquationsbyeliminationofarbitraryconstantsandarbitraryfunctions,solutionsoffirstorderlinearequationsusing Lagrange'smethod.
SecondorderHomogeneousLinear Partialdifferentialequationswithconstantcoefficients.

UNITIV Vectordifferentiation
Scalar and vector point functions, del operator, Gradient – unit normal vector, angle betweensurfaces,directionalderivative,Divergence-SolenoidalvectorandCurl–irrotational.,scalarpotential.

UNITV Vectorintegration
Lineintegral–circulation–workdone,-flux,Green'stheoremintheplane(withoutproof), Stoke's theorem (without proof), Divergence theorem (without proof) and problemsonabovetheorems.

Textbooks:

1. ErwinKreyszig,AdvancedEngineeringMathematics,10/e,JohnWiley& Sons,2018.
2. B.S.Grewal,HigherEngineeringMathematics,44/e,Khannapublishers,2017.

ReferenceBooks:

1. Dennis G.Zilland Warren S.Wright, Advanced Engineering Mathematics, Jones andBartlett,2018.
2. MichaelGreenberg,AdvancedEngineeringMathematics,9thedition,Pearsonedn
3. GeorgeB.Thomas,MauriceD.WeirandJoelHass,ThomasCalculus,14/e,PearsonPublishers,2018.
4. R.K.JainandS.R.K.Iyengar,AdvancedEngineeringMathematics,5/e,AlphaScienceInternational

Ltd.,2021(9threprint).
5. B.V.Ramana, Higher EngineeringMathematics, McGrawHillEducation, 2017

IYear–ISemester		L	T	P	C
Course Code(100023 1102**)**	**ENGINEERINGPHYSICS (CommonforallbranchesofEngineering)**	**3**	**0**	**0**	**3**

COURSEOBJECTIVES

1. Bridging the gap between the Physics in school at 10+2 level and UG level engineeringcourses.
2. To identify theimportance of the optical phenomenon.interference,diffraction andpolarizationrelatedtoits Engineeringapplications
3. EnlightentheperiodicarrangementofatomsinCrystallinesolidsbyBragg'slaw
4. To explain the significant concepts of dielectric and magnetic materials that leads topotentialapplicationsinthe emergingmicrodevices.
5. Enlightenment of the concepts of Quantum Mechanics and to provide fundamentals ofdeBroglie matter waves, quantum mechanical wave equation and its application, theimportanceoffreeelectrontheoryformetals.
6. To Understand the Physics of Semiconductors and their working mechanism, Conceptutilizationoftransportphenomenonofchargecarriersinsemiconductors.

COURSEOUTCOMES

CO1. **Explain**theneedofcoherentsourcesandtheconditionsforsustained interference(L2). **Identify**theapplicationsofinterferenceinengineering (L3).**Analyze**thedifferencesbetween interference and diffraction with applications (L4). **Illustrate** the concept ofpolarization of light and its applications (L2). **Classify** ordinary refracted light andextraordinaryrefractedraysbytheirstatesofpolarization(L2)

CO2. **Classify** various crystalsystems (L2). **Identify** different planes inthecrystalstructure(L3).**Analyze**thecrystallinestructurebyBragg'sX-raydiffractometer(L4).

CO3. **Explain**the conceptofdielectricconstantandpolarizationindielectricmaterials(L2). **Summarize** various types ofpolarizationofdielectrics(L2).**Interpret**Lorentzfieldand Claussius-Mosottirelationindielectrics(L2).**Classify**themagneticmaterialsbasedonsusceptibilityandt heirtemperaturedependence(L2).

CO4. **Describe** the dual nature ofmatter(L1). **Explain**the significanceofwavefunction(L2).**Identify** the role of Schrodinger's time independent waveequation in studying particleinone- dimensionalinfinite potentialwell (L3).**Identify**the role ofclassical andquantumfreeelectrontheoryinthestudyofelectricalconductivity(L3).

CO5. **Classify** the crystalline solids (L2). **Outline** the properties of charge carriers insemiconductors (L2). **Identify** the type of semiconductor using Hall effect (L2).**Apply**theconceptofeffective massofelectron(L3).

Unit-I:WaveOptics

ReflectionGeometry)&applications-Colorsinthinfilms-Newton'sRings-Determinationofwavelengthandrefractiveindex.
Diffraction: Introduction-FresnelandFraunhoferdiffractions-Fraunhoferdiffractionduetosingleslit,doubleslit&DiffractionGrating(Qualitative).
Polarization: Introduction -Types of polarization - Polarization by reflection, and Doublerefraction-Nicol'sPrism-HalfwaveandQuarterwaveplates.

UnitOutcomes:

Thestudentswillbeableto

- **Explain**theneedofcoherentsourcesandtheconditionsforsustainedinterference(L2)
- **Identify**engineeringapplicationsofinterference(L3)
- **Illustrate**theconceptofpolarizationoflightanditsapplications(L2)
- **Classify**ordinarypolarizedlightandextraordinarypolarizedlight(L2)

UnitII:Crystallography

Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystalsystems (3D) – coordination number- packing fraction of SC,BCC & FCC - Millerindices– separationbetweensuccessive(hkl)planes.Bragg'slaw-X-rayDiffractometer.

UnitOutcomes:

Thestudentswillbeableto

- **Classify**variouscrystalsystems(L2)
- **Identify**differentplanesinthecrystalstructure(L3)
- **Analyze**thecrystallinestructurebyBragg'sX-raydiffractometer(L4)

Unit-III:DielectricandMagneticMaterials

Dielectric Materials: Introduction -Dielectricpolarization-Dielectricpolarizability,Susceptibility,DielectricconstantandDisplacementVector - Types of polarizations- Electronic(Quantitative), Ionic (Quantitative) and Orientation polarizations(Qualitative)-Lorentzinternalfield-Clausius-Mossottiequation.
MagneticMaterials: Introduction-Magneticdipolemoment-Magnetization-Magneticsusceptibilityand permeability - Classification of magneticmaterials: Dia, para, Ferro, antiferro & Ferri magneticmaterials - Domain concept for Ferromagnetism (Qualitative) - Hysteresis - soft and hard magneticmaterials.

UnitOutcomes:

Thestudents willbeableto

- **Explain**theconceptofdielectricconstantandpolarizationindielectricmaterials(L2)
- **Summarize**varioustypesofpolarizationofdielectrics(L2)
- **Interpret**Lorentz fieldandClaussius-Mosottirelationindielectrics(L2)
- **Classify**themagneticmaterialsbasedonsusceptibilityandtheirtemperaturedependence(L2)

Unit-IV:QuantumMechanicsandFreeelectrontheory

Quantum Mechanics: Dual nature ofmatter–Heisenberg'sUncertaintyPrinciple– Significanceand properties of wave function – Schrodinger's time independent and dependent wave equations– Particleinaone-dimensionalinfinitepotentialwell.
FreeElectronTheory: Classicalfreeelectrontheory (Qualitativewith discussionofmeritsanddemerits)– Quantumfreeelectrontheory–electricalconductivitybasedonquantumfreeelectrontheory-Fermi-Dirac distributionanditstemperaturedependence.

UnitOutcomes:

Thestudentswillbeableto

- **Explain**theconceptofdualnatureofmatter(L2)
- **Understand**thesignificanceofwavefunction(L2)
- **Interpret**theconceptsofclassicalandquantumfreeelectrontheories(L2)

Unit–V:Semiconductors

Semiconductors: Formationofenergybands–classificationofcrystallinesolids-Intrinsicsemiconductors:Densityofchargecarriers–Electricalconductivity–Extrinsicsemiconductors:density of charge carriers - Drift and diffusion currents – Einstein'sequation - Hall effect and itsApplications.

UnitOutcomes:
Thestudentswillbeableto

- **Outline**thepropertiesofchargecarriersinsemiconductors(L2)
- **Understand**thecarriertransportation insemiconductors(L2)
- **Identify**thetypeofsemiconductorusingHalleffect(L2)

Textbooks:

- ATextbookofEngineeringPhysics"-M.N.Avadhanulu,P.G.Kshirsagar&TVSArunMurthy,S.ChandPublications,11thEditio n2019.
- "EngineeringPhysics"-D.K.BhattacharyaandPoonamTandon,Oxfordpress(2015).
- "EngineeringPhysics" - P.K.PalanisamySciTechpublications.

ReferenceBooks:

- "FundamentalsofPhysics"-Halliday,ResnickandWalker,JohnWiley&Sons.
- "EngineeringPhysics"-M.R.Srinivasan,NewAgeinternationalpublishers(2009).
- "EngineeringPhysics" -ShatendraSharma,JyotsnaSharma,PearsonEducation,2018.
- "EngineeringPhysics"-SanjayD.Jain,D.SahasrabudheandGirish,UniversityPress.
- "Semiconductorphysicsanddevices:Basicprinciple"-A. Donald,Neamen, McGrawHill.
- "EngineeringPhysics"-B.K.PandeyandS.Chaturvedi,CengageLearning
- "Solidstatephysics"–A.J.Dekker,PanMacmillanpublishers
- "IntroductiontoSolidStatePhysics"-CharlesKittel,Wiley

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IYear–IISemester		L	T	P	C
Course Code (1000231103**)**	**COMMUNICATIVEENGLISH** (CommontoAllBranchesofEngineering)	**2**	**0**	**0**	**2**

CourseObjectives:

The main objective of introducing this course, *Communicative English,* is to facilitate using Listening,Reading,SpeakingandWritingskillseffectivelybythestudents.Itshouldresultintheirbettercomprehendingabilities,oralpresentations,reportingusefulinformationandwithenhancedknowledgeof grammatical structures and vocabulary. This course helps the students in using speaking and writing(productive)skillsmoreefficientlyandtomakethemindustry-ready.

CourseOutcomes

- **Bytheendofthecoursethestudentswillhave**Learnedhowtounderstandthecontext,topic,andspecific informationfromsocialortransactionaldialogues.
- Remediallylearnapplyinggrammaticalstructurestoformulatesentencesanduseappropriatewordsand correctwordforms.
- Usingdiscoursemarkerstospeakclearlyonaspecifictopicinformalaswellasinformaldiscussions.(n otrequired)
- Improvedcommunicativecompetenceinformalandinformalcontextsandforsocialandacademic purposes.
- Criticallycomprehendingandappreciatingreading/listeningtextsandtowritesummariesbasedonglob alcomprehensionofthesetexts.
- Writingcoherentparagraphsessays,letters/e-mailsandresume.

Instructions:

1. The reading texts canbegivenaspodcaststothe studentsso thattheirlistening skillscanbeenhanced.
2. Whilelisteningandreadingtothetextcanbegivenashomework,theclassworkforthestudentscanbetod iscussandcriticallyevaluatethetextsbasedonthecontext,purposeorwritingthetextandunderstanding itfromtheauthor'saswellasreader'spointofview.
3. Reading as habit for both academic and non-academic (pleasure) purposes has to be inculcatedinthestudents.Sotraininghastobegiveninintensiveandextensivereadingstrategies.
4. Writingforbothacademic(assignments,examinations,reports,e-mails/lettersetc)
5. The writing tasks given in the class are to be selfand peer evaluated by the students before theyarefinallygradedbythefaculty.

   Note: Please note that the texts given here are just contexts for teaching various languageskillsandsubskills.Thestudents'abilitytouselanguagecannotbeconfinedtocomprehending or using thelanguage related to the given texts (textbooks). The giventextscanbeusedonlyforpractice.
6. All the activities to developlanguage skills have to be integrated and interconnected, withineachunitandacrosstheunits.
7. Use as many supplementary materials as possible in various modes (Audio, visual and printedversions) in the classroom so that the students get multimode input and will know howto uselanguageskillsintheabsenceoftheteacher.

UNITI

Lesson:HUMANVALUES:APowerofaPlateofRicebyIfeomaOkoye(Shortstory)

Listening: Identifying the topic, the context and specific pieces of information by listeningtoshortaudiotextsandansweringaseriesofquestions.
Speaking: Askingandansweringgeneralquestionsonfamiliartopicssuchashome,family,work,studiesandinterests,introducingoneselfandothers.
Reading: Skimming to get the main idea of a text; scanning to look for specific pieces ofinformation.
Writing: E-Mail writing, Mechanics of Writing-Capitalization, Spellings, and Punctuation-PartsofSentences. (*Thathastobepartofthebridgecourse-2weeksbeforetheactualacademicprogrammestarts*)
Grammar: PartsofSpeech,BasicSentenceStructures-formingquestions
Vocabulary: Synonyms,Antonyms,Affixes(Prefixes/Suffixes),Rootwords.

UNITII

Lesson:NATURE:NightoftheScorpionbyNissimEzekiel(Indianandcontemporary)

Listening: Answering a series of questions about main ideas and supporting ideas afterlisteningtoaudiotexts.
Speaking: Discussion in pairs/small groups on specific topics followed by shortstructuretalksandBook/movie/articlereview.
Reading: Identifying sequence of ideas; recognizing verbal techniques that help to linktheideasinaparagraphtogether.
Writing: Structureofaparagraph-Paragraphwriting(specifictopics).
Grammar: Cohesivedevices-linkers,useofarticlesandzeroarticleprepositions.
Vocabulary: Homonyms,Homophones,Homographs.

UNITIII

Lesson:BIOGRAPHY:SteveJobs

Listening: Listeningforglobalcomprehension andsummarizingwhatislistenedto.
Speaking: Discussingspecifictopicsinpairsorsmallgroupsandreportingwhatisdiscussed.
Reading: Readingatextindetailbymakingbasicinferences-recognizingandinterpretingspecific contextclues;strategiestousetextcluesforcomprehension.
Writing: Summarizing,Note-making,Paraphrasing.
Grammar: Verbs-tenses;subject-verbagreement;Compoundwords,Collocations.
Vocabulary: Compoundwords,Collocations

UNITIV

Lesson:INSPIRATION:TheToysofPeacebySaki

Listening: Making predictions whilelistening toconversations/ transactional dialogueswithoutvideo;listeningwithvideo.

Speaking: RoleplaysforpracticeofconversationalEnglishinacademiccontexts(formalandinformal)-askingforandgivinginformation/directions.

Reading: Studying the use of graphical elements in texts to convey information, revealtrends/patterns/relationships,communicateprocessesordisplaycomplicated data.

Writing: Letter Writing: Official Letters, **Resumes (This can be part of Lab course)Grammar:**Active&PassiveVoice

Vocabulary: Wordsoften confused,Jargons

UNITV

Lesson:MOTIVATION:ThePowerofIntrapersonalCommunication(AnEssay)

Listening: Identifyingkeyterms,understandingconceptsandansweringaseriesofrelevantquestionstha ttestcomprehension.

Speaking: Formaloralpresentationsontopicsfromacademiccontexts.

Reading: Readingcomprehension.

Writing: Writingsstructuredessayson specifictopics.

Grammar: Editing shorttexts, identifyingand correctingcommonerrorsingrammar andusage.(Articles,prepositions,tenses,subject-verbagreement).

Vocabulary: Technical Jargons.

Textbooks:

1. Pathfinder: Communicative English for Undergraduate Students,1st Edition, Orient BlackSwan,2023 (Units1,2&3).
2. EmpoweringEnglishbyCengagePublications,2023(Units4&5).

Suggestion:Insteadofgivingthesyllabusintheformoftextbooksitwouldbebettertoprocurethe soft copies of individual texts (stories or poems or biographies and non-fiction texts) bythe university and make them available on the university website for registered studentstoaccessanddownload.

ReferenceBooks:

1. Dubey,ShamJi &Co.EnglishforEngineers,VikasPublishers,2020.
2. Bailey, Stephen.Academic writing: A Handbook forInternational Students.Routledge,2014.
3. Murphy,Raymond.EnglishGrammarinUse,FourthEdition,CambridgeUniversityPress,2019.
4. Lewis,Norman.WordPowerMadeEasy-TheCompleteHandbookforBuildingaSuperiorVocabulary.Anchor,2014.

WebResources:

GRAMMAR:

1. www.bbc.co.uk/learningenglishhttps://dictionary.cambridge.org/grammar/british-grammar/

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I Year – IISemester	BASICELECTRICAL&ELECTRONICSENGINEERING (CommontoAllbranchesofEngineering)	L	T	P	Credits
CourseCode: (1002231101)		3	0	0	3

CourseObjectives:
To expose to the field of electrical & electronics engineering, laws and principles of electrical/electronic engineering and toacquirefundamentalknowledgeintherelevantfield.
CourseOutcomes: Afterthecompletionofthecoursestudentswillbeableto

	CourseOutcome
CO1	Remember thefundamentallaws,operatingprinciplesofmotors,generators,MC andMIinstruments.
CO2	UnderstandtheproblemsolvingconceptsassociatedtoACandDCcircuits,constructionand operationofACandDCmachines,measuringinstruments;different powergenerationmechanisms,Electricitybillingconceptandimportantsafetymeasuresrelatedtoelectricaloperations.
CO3	Applymathematicaltoolsandfundamentalconceptstoderivevariousequations relatedtomachines,circuitsandmeasuringinstruments;electricitybillcalculationsandlayoutrepresentationofelectricalpowersystems.
CO4	Analyzedifferentelectricalcircuits,performanceofmachinesandmeasuringinstruments.
CO5	EvaluatedifferentcircuitconfigurationsMachineperformanceandPowersystemsoperation.

PARTA:BASICELECTRICALENGINEERING

UNIT-I:DC&ACcircuits **(8Hours)**

DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL &KVL,series,parallel,series-parallelcircuits,SuperPositiontheorem,Simplenumericalproblems.**AC Circuits:** A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period,frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peakfactor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept ofImpedance, Active power, reactive power and apparent power, Concept of power factor (SimpleNumericalproblems).

UNIT-II:MachinesandMeasuringInstruments **(8 Hours)Machines:**Construction,principleandoperationof(i)DCGenerator,(ii)SinglePhaseTransformerand(iii)ThreePhaseInductionMotor,Applicationsofelectricalmachines.

MeasuringInstruments: ConstructionandworkingprincipleofPermanentMagnetMovingCoil(PMMC),MovingIron(MI)InstrumentsandWheatStone bridge.

UNIT-III:Electricity Bill&SafetyMeasures (8 Hours)Electricity bill: Power rating of household appliances including air conditioners, PCs, Laptops,Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricitytariff,calculationofelectricitybillfordomesticconsumers.

Equipment Safety Measures: Working principle of Fuse and Miniature circuit breaker (MCB),merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, SafetyPrecautions toavoidshock.

TextBooks:

1) *BasicElectricalEngineering*,D.C.Kulshreshtha,TataMcGrawHill,2019,FirstEdition
2) *PowerSystemEngineering*,P.V.Gupta,M.L.Soni,U.S.BhatnagarandA.Chakrabarti,Dhan patRai&Co, 2013
3) *FundamentalsofElectricalEngineering*,RajendraPrasad, PHIpublishers,2014,ThirdEdition

ReferenceBooks:

1) *BasicElectricalEngineering*,D.P.KothariandI.J.Nagrath,McGrawHill,2019,FourthE dition
2) *PrinciplesofPowerSystems*,V.K.Mehtha,S.ChandTechnicalPublishers,2020
3) *BasicElectricalEngineering*,T.K.NagsarkarandM. S.Sukhija,OxfordUniversityPress,2017
4) *BasicElectrical andElectronicsEngineering*, S.K. Bhatacharya,PersonPublications,2018,SecondEdition.

E-Resources:

1) https://nptel.ac.in/courses/108105053
2) https://nptel.ac.in/courses/108108076

PARTB:BASICELECTRONICSENGINEERING

CourseObjectives:

- To teach the fundamentals of semiconductor devices and its applications, principles ofdigitalelectronics

UNITI SEMICONDUCTORDEVICES

Introduction-Evolutionofelectronics–Vacuumtubestonanoelectronics-Characteristicsof PNJunction Diode—ZenerEffect—ZenerDiodeanditsCharacteristics. Bipolar Junction Transistor— CB, CE, CC Configurations andCharacteristics.

UNITII BASICELECTRONICCIRCUITSANDINSTRUMENTTAION

Rectifiers and power supplies: Block diagram description of a dc power supply,working of a full wave bridge rectifier, capacitor filter (no analysis), working ofsimplezenervoltageregulator.Amplifiers:BlockdiagramofPublicAddresssystem.ElectronicInstrumentation:Blockdiagramofanelectronicinstrumentationsystem.

UNITIII DIGITALELECTRONICS

Overview of Number Systems, Logic gates including Universal Gates, BCD codes,Excess-3 code, Gray code, Hamming code. Boolean Algebra, Basic Theorems andpropertiesofBooleanAlgebra,TruthTablesandFunctionalityofLogicGates– NOT,OR, AND, NOR, NAND, XORand XNOR. Simple combinational circuits– Half andFullAdders.

Textbooks:

1. R.L.Boylestad&LouisNashlesky,ElectronicDevices&CircuitTheory, PearsonEducation,2021.
2. R.P.Jain,ModernDigitalElectronics,4th Edition,TataMcGrawHill,2009

ReferenceBooks:

1. R.S.Sedha,ATextbookofElectronicDevicesandCircuits,S.Chand&Co,2010.
2. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals,PrenticeHall,India,2002.
3. R.T.Paynter,IntroductoryElectronicDevices&Circuits– ConventionalFlowVersion,PearsonEducation,2009

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IYear–IISemester		L	T	P	C
Course Code(1005231201**)**	**DATASTRUCTURES (Common toCSE,IT&allied branches)**	**3**	**0**	**0**	**3**

CourseObjectives:

• Understandthesignificanceoflineardatastructuresinproblem-solvingandbasic time/spacecomplexityanalysis.
• Createandmanagelinkedliststoefficientlyorganizeandmanipulatedata,emph asizingmemoryefficiency.
• Implementandapplystackstomanageprogramflowandsolveproblemsinvol vingexpressionevaluationandbacktracking.
• Utilize queues to model real-world scenarios, such as process scheduling andbreadth-first search algorithms and understand the versatility of deques andprioritizedatamanagementusingpriorityqueues.
• Impartbasicunderstanding ofnon-lineardatastructuressuchas trees.
• Explorebasicconceptsofhashingandapplyittosolveproblemsrequiringfastdataret rievalandmanagement.

UNITI

Introduction to Linear Data Structures: Definition and importance of linear datastructures,Abstract data types (ADTs) and their implementation, Overview of timeand space complexity analysis for linear data structures. **Searching Techniques**:Linear & Binary Search, **Sorting Techniques**: Bubble sort, Selection sort, InsertionSort

UNITII

LinkedLists: Singlylinkedlists,representationandoperations,doublylinkedlistsand circularlinked lists, Comparing arrays and linked lists, Applications of linkedlists.

UNITIII

Stacks: Introduction to stacks: properties and operations, implementing stacksusing arrays andlinked lists, Applications of stacks in expression evaluation,backtracking,reversinglistetc.

UNITIV

Queues: Introductiontoqueues:propertiesandoperations,implementingqueuesusing arraysand linked lists, Applications of queues in breadth-first search,scheduling,etc.

Deques: Introduction to deques (double-ended queues), Operations ondequesandtheirapplications.

UNITV

Trees: Introduction to Trees, Binary Search Tree – Insertion, Deletion & Traversals**Hashing:** Brief introduction to hashing and hash functions, Collision resolutiontechniques: chaining and open addressing, Hash tables: basic implementation andoperations, Applicationsofhashinginuniqueidentifiergeneration,caching, etc.

CourseOutcomes:Attheendofthecourse,Studentwillbeableto

• Explaintheroleoflinear datastructuresinorganizing and accessingdataefficientlyinalgorithms.
• Design,implement,andapplylinkedlistsfordynamicdatastorage,demonstratingunderstandingofmemoryallocation.
• Developprogramsusingstackstohandlerecursive algorithms,manageprogramstates,andsolve relatedproblems.
• Apply queue-based algorithms for efficient task scheduling and breadth-firsttraversalingraphsanddistinguishbetweendequesand priorityqueues,andapplythemappropriatelytosolvedatamanagementchallenges.
• Devisenovelsolutionstosmallscaleprogrammingchallengesinvolvingdatastructures suchasstacks,queues,Trees
• Recognizescenarioswherehashingisadvantageous, anddesignhash-basedsolutionsforspecificproblems.

Textbooks:

1. DataStructuresandalgorithmanalysisinC,Mark AllenWeiss,Pearson,2ndEdition.
2. FundamentalsofdatastructuresinC,EllisHorowitz,SartajSahni,SusanAnderson-Freed,SiliconPress,2008

ReferenceBooks:

1. Algorithmsand DataStructures:TheBasicToolboxbyKurtMehlhornandPeterSanders
2. CDataStructuresandAlgorithmsbyAlfredV.Aho,JeffreyD.Ullman,andJohnE.Hopcroft
3. ProblemSolvingwith AlgorithmsandDataStructures"byBradMillerandDavidRanum
4. Introductionto AlgorithmsbyThomasH. Cormen,CharlesE.Leiserson,RonaldL.Rivest,andCliffordStein
5. AlgorithmsinC,Parts1-5(Bundle):Fundamentals,DataStructures,Sorting,Searching,andGraphAlgorithms"byRobertSedgewick

I Year – IISemester		L	T	P	C
CourseCode: (1000231111)	**ENGINEERINGPHYSICSLAB** **(Common toAllBranchesofEngineering)**	**0**	**0**	**2**	**1**

CourseObjectives:

To study the concepts of optical phenomenon like interference, diffraction etc., recognize theimportance of energy gap in the study of conductivity and Hall effect in semiconductors andstudy the parameters and applications of dielectric and magnetic materials by conductingexperiments.

CourseOutcomes: Thestudentswillbeableto
CO1: Operate optical instruments like travelling microscope and spectrometer.CO2:Estimatethewavelengthsofdifferentcoloursusingdiffractiong rating.
CO3: Plot the intensity of the magnetic field of circular coil carrying current with distance.CO4:Evaluatedielectricconstantandmagneticsusceptibilityfordielectricandmagneticma terialsrespectively.
CO5: Calculate the band gap of a given semiconductor.CO6:Identifythetypeofsemiconductor usingHalleffect.

ListofExperiments:

1. DeterminationofradiusofcurvatureofagivenPlano-convexlens byNewton'srings.
2. Determination of wavelengths of different spectral linesinmercuryspectrumusingdiffractiongratinginnormalincidenceco nfiguration.
3. VerificationofBrewster'slaw
4. Determination of dielectric constant for a dielectric substance using dielectric constantapparatus
5. StudythevariationofBversusHbymagnetizingthemagneticmaterial(B-Hcurve).
6. DeterminationofwavelengthofLaserlightusingdiffractiongrating.
7. EstimationofPlanck'sconstantusingphotocell.
8. Determinationoftheresistivityofsemiconductorsbyfourprobemethods.
9. To study V-I characteristics of a PN junction diode in forward and reverse biasingconditions.
10. MagneticfieldalongtheaxisofacurrentcarryingcircularcoilbyStewartGee'sMethod.
11. DeterminationofHallvoltageandHallcoefficientofagivensemiconductorusingHalleffect.
12. Determinationoftemperaturecoefficientsofathermistor.
13. Determinationofaccelerationduetogravityandradiusof Gyrationbyusingacompoun dpendulum.
14. DeterminationofmagneticsusceptibilitybyKundt'stubemethod.
15. Determinationofrigiditymodulusofthematerialofthegivenwireusing Torsionalpendulum.
16. Sonometer:Verificationoflawsofstretchedstring.
17. Determinationofyoung'smodulusforthegivenmaterialofwoodenscalebynon-uniformbending(ordoublecantilever)method.
18. Determinationof Frequencyofelectricallymaintainedtuningforkby Melde'sexperiment.
19. StudyofV-Icharacteristics ofsolarcell

20. Determineoflaserbeandivergenceandspotsizeofadiodelaserbeam

Note: AnyTENofthelistedexperimentsaretobeconducted.OutofwhichanyTWOexperimentsmaybe conductedinvirtualmode.

References:

- ATextbookofPracticalPhysics- S.Balasubramanian,M.N.Srinivasan,S.ChandPublishers,2017.

WebResources

- www.vlab.co.in
- https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype

IYear–IISemester	ELECTRICAL&ELECTRONICSENGINEERINGWORKSHOP (CommontoAllbranchesofEngineering)	L	T	P	Credits
Course Code:(1002231110)		0	0	3	1.5

CourseObjectives:
To impart knowledge on the fundamental laws & theorems of electrical circuits, functions ofelectricalmachines andenergycalculations.

CourseOutcomes:

	CourseOutcome
CO1	Understand the Electricalcircuit designconcept; measurement ofresistance, power,power factor;conceptofwiringandoperationofElectricalMachinesandTransformer.
CO2	Applythetheoreticalconceptsandoperatingprinciplestoderivemathematicalmodelsforcircuits,Electricalmachinesandmeasuringinstruments;calculationsforthe measurementofresistance,powerandpower factor.
CO3	Applythetheoreticalconceptstoobtaincalculationsforthemeasurementofresistance,poweranddpowerfactor.
CO4	Analyse various characteristics of electrical circuits,electricalmachines andmeasuringinstruments.
CO5	Designsuitablecircuitsandmethodologiesforthemeasurementofvariouselectricalparameters;Householdandcommercialwiring.

Activities:

1. Familiarization of commonly used Electrical & Electronic Workshop Tools: Bread board,Solder,cables,relays,switches,connectors,fuses,Cutter,plier,screwdriverset,wirestripper, flux,knife/blade,solderingiron,de-solderingpumpetc.
   - Providesomeexercisessothathardwaretoolsandinstrumentsarelearnedtobeusedbythestudents.
2. Familiarization of Measuring Instruments like Voltmeters, Ammeters, multimeter,LCR-Qmeter,PowerSupplies, CRO,DSO,FunctionGenerator,Frequencycounter.
   - Providesomeexercisessothatmeasuringinstrumentsarelearnedtobeusedbythestudents.
3. Components:
   - Familiarization/Identification of components (Resistors, Capacitors, Inductors,Diodes,transistors,IC'setc.) –Functionality,type,size, colourcodingpackage,symbol,costetc.
   - Testing of components like Resistor, Capacitor, Diode, Transistor, ICs etc. - Comparevalues of components like resistors, inductors, capacitors etc with the measured valuesbyusinginstruments

PART-A:ELECTRICALENGINEERINGLAB

ListofExperiments:

1. VerificationofKCLandKVL
2. VerificationofSuperpositiontheorem
3. MeasurementofResistanceusingWheatstonebridge
4. MagnetizationCharacteristics ofDCshuntGenerator
5. MeasurementofPowerandPower factor usingSingle-phasewattmeter
6. MeasurementofEarthResistanceusingMegger
7. CalculationofElectricalEnergyforDomesticPremises

ReferenceBooks:

5) *BasicElectricalEngineering*,D.C.Kulshreshtha, TataMcGrawHill, 2019,FirstEdition
6) *Power System Engineering*, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai&Co,2013
7) *FundamentalsofElectricalEngineering*,RajendraPrasad,PHIpublishers,2014,ThirdEdition

Note: MinimumSixExperimentstobeperformed.

PARTB:ELECTRONICSENGINEERINGLAB

CourseObjectives:

- Toimpartknowledgeontheprinciplesofdigitalelectronicsandfundamentalsofelectrondevices&its applications.

CourseOutcomes: Attheendofthecourse,thestudentwillbeabletoCO1:Identify&testingofvariouselectroniccomponents.
CO2: Understand the usage of electronic measuring instruments.CO3:Plotanddiscussthecharacteristicsofvarious electrondevices.CO4:Explaintheoperationofadigitalcircuit.

ListofExperiments:

1. PlotV-IcharacteristicsofPNJunctiondiodeA)Forward biasB)Reversebias.
2. PlotV–IcharacteristicsofZenerDiodeanditsapplicationasvoltageRegulator.
3. Implementationofhalfwaveandfullwaverectifiers
4. Plot Input&OutputcharacteristicsofBJTinCEandCBconfigurations
5. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gatesusingICs.
6. VerificationofTruthTablesofS-R,J-K&Dflipflopsusingrespective ICs.

Tools/EquipmentRequired:DCPowersupplies,Multimeters,DCAmmeters,DCVoltmeters,ACVoltmeters,CROs,alltherequiredactivedevices.

References:

1. R.L.Boylestad&LouisNashlesky,ElectronicDevices&CircuitTheory,PearsonEducation,2021.
2. R.P.Jain,ModernDigitalElectronics,4thEdition,TataMcGrawHill,2009
3. R.T.Paynter,IntroductoryElectronicDevices&Circuits–ConventionalFlowVersion,PearsonEducation,2009.

Note:Alltheexperimentsshallbeimplementedusingboth HardwareandSoftware

IYear–IISemester		L	T	P	C
Course Code(1005231210**)**	**DATASTRCTURESLAB (CommontoCSE,IT&alliedbranchesofEngineering)**	**0**	**0**	**3**	**1.5**

CourseObjectives:

• Understandthesignificanceof lineardatastructuresinproblem-solvingandbasictime/spacecomplexityanalysis.
• Createandmanagelinkedliststoefficientlyorganizeandmanipulatedata,emphasizingmemoryefficiency.
• Implementandapplystackstomanageprogramflowandsolveproblemsinvolvingexpression evaluationandbacktracking.
• Utilize queues to model real-world scenarios, such as process scheduling and breadth-first search algorithms and understandtheversatilityof dequesand prioritizedatamanagementusingpriorityqueues.
• Impartbasicunderstandingofnon-lineardatastructuressuchastrees.
• Explorebasicconcepts ofhashingand applyittosolve problems requiringfast dataretrievalandmanagement.

ListofExperiments:

Exercise1:ArrayManipulation
i) Writeaprogramtoreverseanarray.
ii) CProgramstoimplementtheSearchingTechniques–Linear&BinarySearch
iii) CProgramstoimplementSorting Techniques–Bubble,SelectionandInsertionSort

Exercise2:LinkedListImplementation
i) Implementasinglylinkedlistand performinsertionanddeletionoperations.
ii) Developaprogramtoreverse alinkedlistiterativelyandrecursively.
iii) Solveproblemsinvolvinglinkedlisttraversalandmanipulation.

Exercise3:LinkedListApplications
i) Createaprogramtodetectandremoveduplicatesfromalinkedlist.
ii) Implementalinkedlisttorepresentpolynomialsandperformaddition.
iii) Implementadouble-ended queue(deque)withessentialoperations.

Exercise4:DoubleLinkedListImplementation
i) Implementadoublylinkedlistandperformvariousoperationstounderstanditsproperties andapplications.
ii) Implementacircularlinkedlistand performinsertion,deletion,andtraversal.

Exercise5:StackOperations
i) Implementastackusingarraysandlinkedlists.
ii) Writeaprogramtoevaluateapostfixexpressionusingastack.
iii) Implementaprogramtocheckforbalancedparenthesesusingastack.

Exercise6: QueueOperations

i) Implementaqueueusingarraysandlinkedlists.

ii) Developaprogramtosimulate asimpleprinterqueuesystem.

iii) Solveproblemsinvolvingcircular queues.

Exercise7:StackandQueueApplications

i) Useastacktoevaluateaninfixexpressionand convertittopostfix.

ii) Createaprogramtodeterminewhetheragivenstringisapalindromeornot.

iii) Implementastackorqueuetoperformcomparisonandcheckforsymmetry

Exercise8:BinarySearchTree

i) ImplementingaBST usingLinkedList.

ii) Traversing ofBST.

Exercise9:Hashing

i) Implementahashtablewithcollisionresolutiontechniques.

ii) Writeaprogramtoimplementasimplecacheusinghashing.

Exercise10:Hashing

i)Write a program to implement a graph using BFS.

ii)Write a program to implement a graph using DFS.

CourseOutcomes: Attheendofthecourse,Studentwillbeableto

• Explaintheroleoflinear datastructuresinorganizingandaccessingdataefficientlyinalgorithms.

• Design,implement,andapplylinked listsfordynamicdatastorage,demonstratingunderstandingofmemoryallocation.

• Develop programs using stacks to handle recursive algorithms, manage program states, andsolverelatedproblems.

• Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphsand distinguish between deques and priority queues, and apply them appropriately to solve datamanagementchallenges.

• Devisenovelsolutionstosmallscaleprogrammingchallengesinvolvingdatastructuressuchasstacks, queues, Trees

• Recognizescenarioswhere hashingisadvantageous, anddesignhash-basedsolutionsforspecificproblems.

Textbooks:

1. DataStructuresandalgorithmanalysisinC,Mark AllenWeiss,Pearson,2ndEdition.
2. FundamentalsofdatastructuresinC,EllisHorowitz,SartajSahni,Susan Anderson-Freed,SiliconPress,2008

ReferenceBooks:

1. Algorithmsand DataStructures:TheBasicToolboxbyKurtMehlhornandPeterSanders
2. CDataStructuresandAlgorithmsbyAlfredV.Aho,JeffreyD.Ullman,andJohnE.Hopcroft
3. ProblemSolvingwithAlgorithmsandDataStructures" byBradMillerandDavidRanum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, andCliffordStein
5. AlgorithmsinC,Parts1-5(Bundle): Fundamentals,DataStructures, Sorting,Searching,and GraphAlgorithmsbyRobertSedgewick.

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IYear–IISemester		L	T	P	C
CourseCode:(1012231110)	**ITWORKSHOP** (CommontoAllbranchesofEngineering)	**0**	**0**	**2**	**1**

CourseObjectives:
Tointroducetheinternalpartsofacomputer,peripherals,I/Oports,connectingcables

- TodemonstrateconfiguringthesystemasDualbootbothWindowsandother OperatingSystemsViz.Linux,BOSS
- ToteachbasiccommandlineinterfacecommandsonLinux.
- ToteachtheusageofInternetforproductivityandself-pacedlife-longlearning
- TointroduceCompression,MultimediaandAntivirustoolsandOfficeToolssuchasWordpr ocessors,SpreadsheetsandPresentationtools.

CourseOutcomes:
CO1:PerformHardwaretroubleshooting.
CO2:UnderstandHardwarecomponentsandinterdependencies.CO3:S afeguardcomputersystemsfromviruses/worms.
CO4: Document/ Presentation preparation.CO5:Performcalculationsusing spreadsheets.

PCHardware&Software Installation
Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Drawthe block diagram of the CPU along with the configuration of each peripheral and submit toyourinstructor.

Task 2: Everystudent should disassemble and assemble the PC back to working condition. Labinstructorsshouldverifytheworkand followitupwithaViva.Alsostudentsneedtogothroughthe video which shows the process of assembling a PC. A video would be given as part of thecoursecontent.

Task 3: Every student should individually install MS windows on the personal computer. Labinstructorshouldverifytheinstallationandfollowitupwithaviva.

Task 4: Every student should install Linux on the computer. This computer should havewindowsinstalled.Thesystem shouldbeconfiguredasdual boot(VMWare)withbothWindowsand Linux.Lab instructorsshouldverifytheinstallationandfollowitupwithaViva

Task 5: Every student should install BOSS on the computer. The system should be configuredas dual boot (VMWare) with both Windows and BOSS. Lab instructors should verify theinstallationandfollowitupwithaViva

Internet&WorldWideWeb

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their LocalArea Network and access the Internet. In the process they configure the TCP/IP setting. Finallystudents should demonstrate, to the instructor, how to access the websites and email. If there isno internet connectivity preparations need to be made by the instructors to simulate the WWWontheLAN.

Task2: WebBrowsers,SurfingtheWeb:Studentscustomizetheirweb browserswiththeLANproxysettings,bookmarks,searchtoolbarsandpopupblockers.Also,plug-inslikeMacromedia FlashandJREforapplets shouldbeconfigured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and howto use the search engines. A few topics would be given to the students for which they need tosearchonGoogle.Thisshouldbedemonstratedtotheinstructors bythestudent.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet andwould be asked to configure their computer to be safe on the internet. They need to customizetheirbrowsersto blockpopups,blockactivexdownloadstoavoidvirusesand/orworms.

LaTeXand WORD

Task 1 – Word Orientation: The mentor needs to give an overview of La TeX and Microsoft(MS) office or equivalent (FOSS) toolword: Importance of La TeX and MS office or equivalent(FOSS) tool Word as word Processors, Details of the four tasks and features that would becoveredineach,UsingLaTeXandword–Accessing,overviewoftoolbars,savingfiles,Usinghelpandresources,rulers,formatpainterinword.

Task 2: Using La TeX 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 and Colors, Inserting Header and Footer, Using Date and Time option in both La TeXandWord.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table,BulletsandNumbering,ChangingTextDirection,Cellalignment,Footnote,Hyperlink,Symbols,SpellCheck,TrackChanges.

Task4: CreatingaNewsletter:Featurestobecovered:-TableofContent,Newspapercolumns,Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes,ParagraphsandMailMergeinword.

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 becovered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using helpandresources.

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

Task 2: Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Countfunction,

LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logicaloperators,Conditionalformatting

POWERPOINT

Task1: Studentswillbeworkingonbasicpowerpointutilitiesandtoolswhichhelpthemcreatebasicpowerpointpresentations.PPTOrientation,SlideLayouts,Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes,LinesandArrowsinPowerPoint.

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

Task3: MasterLayouts(slide,template,andnotes),Typesofviews(basic,presentation, slide slotter, notes etc), and Inserting – Background, textures, DesignTemplates,Hiddenslides.

AITOOLS– ChatGPT

Task1: PromptEngineering: Experimentwithdifferenttypesofpromptsto seehowthe modelresponds. Try asking questions, starting conversations, or even providingincompletesentencestoseehowthemodelcompletesthem.

- Ex: Prompt: "You are a knowledgeable AI. Please answer the followingquestion:Whatis thecapitalofFrance?"

Task2: CreativeWriting:Usethemodelasawritingassistant.Providethebeginningofastoryoradescriptionofascene,andletthemodelgeneratetherestofthecontent.Thiscanbeafunwaytobrainstormcreativeideas

- Ex: Prompt: "In a world where gravity suddenly stopped working, peoplestartedfloatingupwards.Writeastoryabouthowsocietyadaptedtothis newreality."

Task 3: Language Translation: Experiment with translation tasks by providing asentence in one language and asking the model to translate it into another language.Comparetheoutputtosee howaccurateandfluentthetranslationsare.

- Ex:Prompt: "Translate the following English sentence to French: 'Hello, howareyoudoingtoday?'"

ReferenceBooks:

2. ComdexInformationTechnologycoursetoolkit,VikasGupta, WILEYDreamtech,2003
3. TheCompleteComputer upgradeand repairbook,CherylASchmidt,WILEYDreamtech,2013,3rdedition
4. IntroductiontoInformationTechnology,ITLEducationSolutionslimited,PearsonEducation,2012,2nd edition
5. PCHardware-AHandbook,KateJ.Chase,PHI(Microsoft)
6. LaTeXCompanion,LeslieLamport,PHI/Pearson.
7. ITEssentialsPCHardwareandSoftwareCompanionGuide,DavidAnfinsonandKenQuamme.– CISCOPress,PearsonEducation,3rd edition
8. ITEssentialsPCHardwareandSoftwareLabsandStudyGuide,PatrickRegan– CISCOPress,PearsonEducation,3rd edition

IYear–IISemester		**L**	**T**	**P**	**C**
Course Code :(1000231110)	**COMMUNICATIVE ENGLISHLAB (CommontoAllBranchesofEngineering)**	**0**	**0**	**2**	**1**

CourseObjectives:

The main objective of introducing this course, *Communicative English Laboratory*, is toexposethe students to a variety of self-instructional,learnerfriendly modes of languagelearning.(Thatcanbefortheorypaper)istotrainthestudentsinoralcommunicationskills inrealsituations.Studentswillgettrainedinthebasiccommunicationskills andalsomakethemready to face job interviews. They will be helped to overcome the mother tongue/locallanguage influence andneutralize their accent which makes their speech more intelligible toalllisteners.

CourseOutcomes:

Bytheendofthecourse,thestudentswillbehave

- UnderstandthedifferentaspectsoftheEnglishlanguage oralcommunicationwithemphasisonListeningandSpeakingSskills.
- Applycommunication skillsthroughvariouslanguagelearningactivities.
- AnalyzetheEnglishspeechsounds,stress,rhythmandintonationforbetterlisteningandspeaking comprehension.
- Evaluate and exhibit professionalism in participating in debates and groupdiscussionswithpoliteturntakingstrategiesandsoundmoreprofessionalwhilecommunicati ngwithothers.
- Create effective resonate and prepare them to face interviews communicate appropriately incorporatesettings.

ListofTopics:

1. Vowels&Consonants(Notrulesbutuseoftheminvarioussyllablestructures)
2. Neutralization/AccentRules(Norulesagain,requiredmorepractice)
3. CommunicationSkills&JAM
4. RolePlay orConversationalPractice
5. **ResumeWriting,**Coverletter(Thiscanbepartoftheory course)
6. GroupDiscussions-Methods&Practice
7. Debates-Methods&Practice
8. PPTPresentations/PosterPresentation
9. InterviewsSkills

SuggestedSoftware:

- WaldenInfoTech
- YoungIndiaFilms

Reference Books:

1. Meenakshi Raman,Sangeeta-Sharma.Technical Communication.OxfordPress.2018.(Thiscanbefortheoryandnotforlab)
2. SamsonT:InnovatewithEnglish,Foundations
3. GrantTaylor:EnglishConversationPractice,TataMcGraw-HillEducationIndia,2016.
4. Jayashree,MLet'sHearthemspeak:DevelopingListening-SpeakingskillsinEnglish.SagePublications.
5. Hewing's, Martin. Cambridge Academic English (B2). CUP, 2012. (That is for readingandwritingandcanbeusedintheoryclassesbutnotinLab)
6. T.Balasubramanyam,ATextbookofEnglishPhoneticsforIndianStudents,(3rdEd)TrinityPress.(Thisisalltheoryandcanbeforma EnglishstudentsbutnotforB.Techstudents)

WebResources:

SpokenEnglish:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ArnelsEverydayEnglish/featured
8. https://www.youtube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/EnglishClass101/featured
10. https://www.youtube.com/c/SpeakEnglishWithTiffani/playlists
11. https://www.youtube.com/channel/UCV1h_cBE0Drdx19qkTM0WNw
12. https://www.linguahouse.com/en-GB
13. https://www.ted.com/watch/ted-ed

Voice&Accent:

1. https://www.youtube.com/user/letstalkaccent/videos
2. https://www.youtube.com/c/EngLanguageClub/featured
3. https://www.youtube.com/channel/UC_OskgZBoS4dAnVUgJVexc
4. https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp_IA

VIGNAN'S INSTITUTE OF ENGINEERING FOR WOMEN (Autonomous)
Accredited by NBA for UG Programs of EEE, ECE, CSE & IT
Accredited by NAAC with A+ Grade (CGPA of 3.49/4.00)

IYear– IISemester		L	T	P	C
Course Code :(1000231121)	**NSS/NCC/SCOUTS&GUIDES/COMMUNITYSERVICE (Commonto AllbranchesofEngineering)**	**0**	**0**	**1**	**0.5**

CourseObjectives:
Theobjectiveofintroducingthiscourseistoimpartdiscipline,character,fraternity,teamwork,social consciousness among the students and engaging them in selflessservice.

CourseOutcomes: Aftercompletionofthecoursethestudentswill beableto
CO1: Understandtheimportanceofdiscipline,characterandservicemotto.
CO2: Solvesomesocietalissuesbyapplyingacquiredknowledge,facts,andtechniques.
CO3: Explorehumanrelationshipsbyanalyzingsocialproblems.
CO4: Determinetoextendtheirhelpfor thefellowbeingsanddowntroddenpeople.
CO5: Developleadershipskills andcivicresponsibilities.

UNITI Orientation
GeneralOrientationonNSS/NCC/Scouts&Guides/CommunityServiceactivities,careerguidance.

Activities:
i) Conducting–icebreakingsessions-expectationsfromthecourse-knowingpersonaltalentsandskills
ii) Conductingorientationsprogramsforthestudents–futureplans-activities-releasingroadmapetc.
iii) Displayingsuccessstories-motivationalbiopics-awardwinningmoviesonsocietalissues etc.
iv) Conductingtalentshowinsingingpatrioticsongs-paintings-anyothercontribution.

UNITII
Nature&Care
Activities:
i) Bestout ofwastecompetition.
ii) Posterandsignsmakingcompetitiontospreadenvironmentalawareness.
iii) Recyclingandenvironmentalpollutionarticlewritingcompetition.
iv) OrganisingZero-wasteday.
v) DigitalEnvironmentalawarenessactivityviavarioussocialmediaplatforms.
vi) Virtualdemonstrationofdifferenteco-friendlyapproachesforsustainableliving.
vii) Writeasummaryonanybookrelatedtoenvironmentalissues.

UNITIII
Community
ServiceActivities:

i) ConductingOneDaySpecialCampinavillagecontactingvillage-arealeaders- Survey in the village, identification of problems- helping them tosolve viamedia-authorities-experts-etc.

ii) ConductingawarenessprogramsonHealth-relatedissuessuchasGeneralHealth,Mentalhealth,SpiritualHealth, HIV/AIDS,
iii) ConductingconsumerAwareness.Explainingvariouslegalprovisionsetc.
iv) Women Empowerment Programmes- Sexual Abuse, Adolescent Health andPopulationEducation.
v) Anyotherprogrammesincollaborationwithlocalcharities,NGOsetc.

ReferenceBooks:

1. NirmalyaKumarSinha&SurajitMajumder,*ATextBookofNationalServiceScheme* Vol;.I, VidyaKutirPublication,2021(ISBN978-81-952368-8-6)
2. *RedBook-NationalCadetCorps*– StandingInstructionsVolI&II,DirectorateGeneralofNCC,MinistryofDefence,NewDelhi
3. DavisM.L.andCornwell D.A.,–IntroductiontoEnvironmental Engineering‖,McGrawHill,NewYork4/e2008
4. MastersG.M.,JosephK.andNagendranR.–Introductionto EnvironmentalEngineeringandScience‖,PearsonEducation,New Delhi.2/e2007
5. RamAhuja.*SocialProblemsinIndia*,RawatPublications,NewDelhi.

GeneralGuidelines:

1. InstitutesmustassignslotsintheTimetablefortheactivities.
2. Institutesarerequiredtoprovideinstructortomentorthestudents.

EvaluationGuidelines:

- Evaluatedforatotalof100marks.
- A student can select 6 activities of his/her choice with a minimum of 01activityperunit.Eachactivityshallbeevaluatedbytheconcernedteacherfor15 marks,totallingto90marks.
- A studentshall be evaluated by the concernedteacher for 10 marks byconductingvivavoceonthe subject.

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