Course No: MTH-1117

Engineering Mathematics -I

Unit 1

Calculus: Differential calculus of functions of several variables, Partial differentiation, Homogeneous functions and Euler's theorem, Taylor's and Maclaurin's series, Taylor's theorem and mean value theorem for functionsof two variables, Errors and approximations.

Unit 2

Applications of Differential Calculus: Maxima and minima of several variables, Lagrange'smethod of multipliers for maxima and minima, Curvature of Cartesian curves, Curvature of parametric and polar curves. Applications of Definite Integrals:Application of definite integrals to area, arclength, surface area and volume, Double integrals, Triple integrals.

Unit 3

Vector Calculus: Scalar and vector fields, differentiation of vectors, Velocity and acceleration, Vector differential operator, Del, Gradient and Divergence, Physical interpretation of the above operators, Line, surface and volume integrals. Application of Vector Calculus: Flux, solenoidal and irrotational vectors, Gauss divergence theorem, Green's theorem in plane, Stoke's theorem, Applications to electromagnetics and fluid mechanics.

Books Recommended

1. Kreyszig E, "Advanced Engineering Mathematics", 8thEd., John Wiley, Singapore (2001).
2. Jain, R K and Iyengar S R K, "Advanced Engineering Mathematics", 2ndEd.,NarosaPublishing House, New Delhi (2003).
3. Das & Mukherjee, "Differential Calculus", U.N. Dhur& Sons Pvt. Ltd.
4. Das & Mukherjee, "Integral Calculus", U.N. Dhur& Sons Pvt. Ltd.

Course No: PHY-1217

Engineering Physics

Unit 1

Vectors and Electrostatics: Work and energy in electrostatics; dielectrics, Polarization, electric displacement, Susceptibility and permittivity, Clausius Mossotti equation. Transformation of vectors. Spherical and cylindrical coordinates system, Gradient of a scalar, Divergence and curl of a vector, Gauss's law and its applications, Electric potential and electric field (in vector form), Potential due to a monopole, Dipole and multipoles (multipole expansion Magneto-statics: Lorentz Force Law; magnetic field of a steady current (Biot-Savart law), Ampere's law and its applications, Ampere's law in magnetized materials.

Unit 2

Electrodynamics: Electromotive force, Faraday's law, Maxwell's Equations, Wave Equation. Poynting Vector, Poynting Theorem (Statement only), Propagationof EM-Wave in conducting and non-conducting media.Interference due to division of wave front and division of amplitude. Young's double slit experiment Interferenceand Diffraction: Interference and principleof superposition. Theory of biprism, Interferences from parallel thin film, wedge shaped films, Newton's rings, Michelson Interferometer. Fresnel's Diffraction, Diffraction at straight edges, Fraunhoffer diffraction due to N-Slits, Diffraction grating, dispersive power of grating, resolving power of prism and grating.

Unit 3

Theory of Relativity: Invariance of an equation and concept of ether, Michelson Morley experiment, Einstein's postulates and Lorentz transformation equations, length, time and simultaneity in relativity, addition of velocity, variation of mass with velocity, mass-energy relation, energy-momentum relation.

Quantum Theory: TheCompton effect, matter waves; group and phase velocities, Uncertainty principle and its application; time independent and time dependent, Schrodinger wave equation, Eigen values and Eigen functions, Born's interpretation and normalization of wave function,

orthogonal wave functions, applications of Schrodinger wave equation (particle in a box and harmonic oscillator).

Books Recommended

1. Griffiths D, "Introduction to Electrodynamics", 2nd Ed., Prentice Hall of India, NewDelhi (1998).
2. Beiser, "Perspective of Modern physics" 5th Ed., McGraw-Hill Ltd., New Delhi (2002).
3. Arya A P "Elementary Modern Physics" Addison-Wesley, Singapore
4. Mani,H S and Mehta G K "Introduction to Modern Physics", Affiliated East West Press, New Delhi.

Course No: ELE-1317

Basic Electrical Engineering

Unit 1

The Circuit Abstraction:

The power of abstraction, The lumped Matter Discipline, The lumped circuit abstraction, Review of basic electrical Signals, Review of electric circuit concepts, Terminology, Electric circuit parameters (Resistance, Conductance,Inductance,Capacitance,Reactance,Impedance),Idealandpractical voltageandcurrentsourcesandtheirtransformation,DependentSources,Powerandenergy relations,Batteries:Basicvoltageandcurrentconsiderations,typesofrechargeableandnon-rechargeablebatteries,Series&ParallelconnectedCells,internalresistanceofbatteries,constant voltage and current sources. Resistors: color coding, Types, circuit model, Variable Resistor Types, potentiometers and rheostats, Power Rating, Ohm'slaw: validity of ohms law, Ohmic and non Ohmic conductors, applicationsof ohms law.

Unit 2

D.C. Circuit Analysis:

Basic electric circuitterminology:Nodes,Junctions,Paths,Loops,Branches,SeriesandParallel combinationsofresistance, VoltageandcurrentDividers, Kirchhoff'scurrentlaw(KCL) and Kirchhoff's voltagelaw(KVL).Analysis of series parallel D.C.Circuits,Loop and Nodal methods: Nodalanalysis,Meshanalysis,Supernode,Supermesh,Delta-Star(Y)Transformation,Super-positiontheorem,Thevenin'sandNorton'stheorems,Maximum powertransfertheorem,Reciprocity and Millman'stheorem.

Unit 3

A.C. Circuitanalysis:

AlternatingVoltage&Current:(Signal,Parameters,Generation,Applications,non-sinusoidalA.C.'s, EMFEquations,Mean,Average,RMS,Peak,Form Factor).Capacitors:Types,Coding,Charging & Discharging,CapacitiveReactance,Capacitorsinseriesandparallels,CapacitiveCircuits.Inductors:

Types,SelfInductance,MutualInductance,Inductorsinseries&Parallels,InductiveReactance,

InductiveCircuits,A.C. power Generation and Transmission,Singleand three phase A.C. systems.

Books Recommended

1. AnnantAggarwaland Jeffery D   Lang,   "FoundationsofanalogandDigitalelectronic   circuits "Elsevier.

2. W H Hayt J E Kemmerly S M Durbin "Engineering Circuit Analysis",Tata McGraw Hill

3. Del Torro, "ElectricalEngineeringFundamentals",2nd Edn,Prentice Hall ofIndia Pvt. Ltd., New Delhi (1994).

4. B.C. Theraja,"Principlesof ElectricalEngineering."

5. Kothari D P and Nagrath I J, "Basic Electrical Engineerin g",Tata McGraw Hill,New

6. Fundamentalsof ElectricCircuits,Alexander Sadeker, McGraw- Hill,3rd Ed.

Course No: CSE-1417

Introduction to Computing

Unit 1

Computer Organization

Computer and processor abstraction, Generations of computers, Hardware Organization of Computer,CentralProcessingunit,Memory,TypesofPrimarymemory,SecondaryStorageDevicesandth eirtypes,InputDevicesandtheirtypes,OutputDevicesandtheirTypes.Varioustypesofports, theirspecificationsand usage.Reviewofbasicdigitalandanalogsignals,BinarynumbersystemandDigitalArithmetic,Digitalcodin gSchemes, Microprocessors,Microcontrollers,CPU,GPU.VariousapplicationsofcomputersinAerospace,Agricultur e,Finance,Medical,Media,IndustriesandCommerce.

Unit2

OperatingSystemsandNetworking-
ComputerSoftwareanditsvarioustypes,Typesofsystemandapplicationsoftwares.Fileanddirectoryopera tionsonWindows,DOSandLinuxOperatingSystems,Useofvarioustoolsandutilitiesin WindowsandLinux, FundamentalsofNetworking,Internet,andvariousservicesofferedthroughtheInternet:LAN,PAN,WAN,M AN,SAN,VPN,WWW,INTERNET,INTRANET,Email,Searchengines.Introductiontovariousnetworking Devices,OSImodel,TCP∕IPprotocolStack.

Unit3

IntroductiontoProgrammingandProblemSolving−TypesofProgrammingLanguages-
MachineLevel,Assemblylevel,andHighLevellanguage,Algorithms,Flow-
charts,Compilation,Assembling,LinkingandLoading,TestingandDebugging,Documentation,Algorithm sforGCD(GreatestCommonDivision)oftwonumbers,Testwhetheranumberisprimeornot,SortingNumb ers,FindingSquarerootandfactorialofanumber,GenerationofFibonaccisequence,Findinglargestnumbe rinanarray,EvaluationofaPolynomial.

Books Recommended

1. P.K.SinhaandP.Sinha,"FoundationofComputers"BPBPublishers.

2. C.VRajaramn,"Fundamentalsofcomputers"PHIpublishers

CourseNo:HUM-1517

CommunicationSkills

Unit 1

Communication: Meaning,itstypes,significance,process,Channels,barrierstoCommunication,making communicationeffective,roleinsociety,Communicationmodel.
DiscussionMeetingandTelephonicSkills:Groupdiscussion,conductingameeting,attendingtelephoniccalls,oralpresentationandroleofaudiovisualaids.Grammar:Transformationofsentences,wordsusedasdifferentpartsofspeechonewordsubstation,abbreviations,technicaltermsetc.

Unit 2

ReadingSkills: Processofreading,readingpurposes,models,strategies,methodologies,readingactivities.**WritingSkills:**Elementsofeffectivewriting,writingstyle,scientificandtechnicalwriting.**ListeningSkills:**Theprocessoflistening,thebarriertolistening,theeffectivelisteningskills,feedbackskills.**SpeakingSkills:**Speechmechanism,organsofspeech,productionandclassificationofspeechsound,phonetictranscription,theskillsofeffectivespeaking,thecomponentsofeffectivetalk.

Unit 3

BusinessLetters: Structureofbusinessletters,languageinbusinessletters.Lettersofinquiryandtheirplaces.SalesLetters,Memorandum,Quotations∕tenders,Bankcorrespondence,Lettersofapplicationandappointments,Resumewriting,ReportWriting,ConductingaMeeting,MinutesofMeeting,OralPresentation,GroupDiscussion,CVwriting,Purchaseorder,JobApplicationLetter.

Books Recommended

1. RodriquesMV,"EffectiveBusinessCommunication",ConceptPublishingCompanyNewDelhi,1992,reprint(2000)

2. Bhattacharya.Indrajit,AnApproachtoCommunicationSkills.DhanpatraiCo.,(Pvt.)Ltd.NewDelhi

3. Wright,Chrissie,HandbookofPracticalCommunicationSkills.JaicoPublishing House.Mumbai

4. GartsideL,ModernBusinessCorrespondence.PitmanPublishingLondon

5. Day,RobertA.,HowtoWriteandPublishaScientificPaper.CambridgeUniversityPressCambridge

6. GimsonAC,"AnIntroductiontothePronunciationofEnglish",ELBS.(YP)

7. Bansal, RK and Harrison JB "Spoken English", Orient Longman Hyderabad.

CourseNo:MEE-1617

Engineering Graphics and Drawing

Unit 1

IntroductiontoEngineeringdrawing: Equipmentanddraftingtools,symbolsandconventionsindrawing. Typesoflinesandtheiruse,materialsectionrepresentation,introductiontodimensioning.Usinganyavaila bleCADsoftwaretodrawsimplemachinepartsandblocks.Useofvariousfundamentalcommandstoeditadr awing,e.g.erase,copy,mirroroffset,array,move,trim.Useoffeatures,extrude,extrudecutandrevolve.Pro jectionofpoints:Projectionofpointsinthefirst,thesecond,thethirdandthefourthquadrant.Projectionofline s:Lineparalleltoboththeplanes‒ lineparalleltothehorizontalplaneandperpendiculartotheverticalplane,lineparalleltoHPandinclinedtoVP ,lineparalleltoHPandinclinedtoprofileplane,lineparalleltoVPandinclinedtoPP,lineinclinedtoboththepla nes.

Unit 2

 Projections:projectiononhorizontalandverticalplanes,principalviews,differentsystemofprojections‒ symbols‒ notations.ProjectionofPlanesinfirstandthirdquadrant.Projectionofsolids,projectionofsolidsinfirstandthi rdquadrant,axisparalleltooneandperpendiculartoother.Sectionofsolids:definitionofsectioninganditspu rpose,procedureofsectioning,applicationtofewtypicalexamples.Developmentofsurfaces:Purposeofde velopment,parallellinemethod.Insertionofnewplanesanddrawingnecessaryfeaturesontheplane.Secti oningandobtainingsectionedviews,dimensioning2ddrawingandlabeling.

Unit 3

Orthographicprojectionsofsimplemachineparts:Drawingofblocksandmachineparts.Isometricprojec tion:Basicprincipleofisometricprojection,Isometricprojectionofsimplemachinepartsforwhichorthograp hicviewsaregiven.Introductiontotemporaryandpermanentfasteners,Representationofscrewthreadsan dthreadedfasteners.Rivetsandrivetedjoints.Weldingsymbols.Introductiontoshaftcouplingsandbearing s:assemblyofvariouscomponentsofuniversalcouplingandOldham'scoupling,typesofbearings,assemb lyofvariouscomponentsofbushedbearingandfootstepbearing.

Books Recommended

1. Gill PS, "*Engineering Graphics and drafting*", Katria and Sons, Delhi (2001).

2. Bhat ND, "*Elementary Engineering Drawing - Plane and Solid Geometry*", Chartotar Publishing House, Anand (1988).

3. Naryana KL and Kanaiah P, "*Engineering Graphics*", Tata McGraw Hill Publishing Company Limited, New Delhi (1992).

4. Luzzadde Warren J, "*Fundamentals of Engineering Drawing*", Prentice Hall of India Private Limited, New Delhi (1988).

5. Bertoline GR, Wiebe EN, Miller GL, and Mother JL, "*Technical Graphics Communication*", Irwin McGraw Hill New York (1997).

Thestudentsarerequiredtoconductexperimentsonfollowingpracticalwork:

1. MeasurementofResistance.

2. Measurementofe∕mbyHelicalmethod.

3. MeasurementofNumericalApertureofOpticalFiber.

4. DeterminationofResistivityofagivenwire.

5. DeterminationofBandGapofasemiconductor.

6. VerifyBiot-Savartlaw.

7. Todeterminetherefractiveindexoftheprismmaterialusingspectrometer.

8. ToverifythelawsofvibratingstringsbyMelde'sexperiments.

9. TodeterminethewavelengthusingFresnsel'sbiprism∕diffractiongrating.

10. ToDeterminePlank'sConstant.

CourseNo:ELE-1317L

BasicElectricalEngineering Lab

Thestudentsarerequiredtoconductexperimentsonfollowingpracticalwork:

1. Togetfamiliarwiththeworkingknowledgeofthefollowinginstruments:
   - i.   DigitalStorageOscilloscope.
   - ii.   CathodeRayOscilloscope(CRO).
   - iii.   Multimeter(AnalogandDigital).
   - iv.   FunctionGenerator.
   - v.   Powersupply.
   - vi.   Variac
2. Tosetthepowersupplyinconstantcurrentandconstantvoltagemode,studyofcurrentlimitinginpower supplies,seriesandparallelcombinationofpowersupplies.
3. Measurementofvariousparameters(voltage,frequency,)ofasignalonDSO/CRO.
4. Handsonwithcontrolslikevolts/division,time/division,trigger,Xmag,positioning,timeandvoltagec ursormeasurements,savingandrecallingofwaveforms.
5. Measurementofresistance,capacitance,voltage,current,continuity,frequencyusingbenchtype/h andheldMultimeter.
6. Handsonwithdifferentcontrols(frequency,typeofwaveform,D.C.offset,dutycycle)offunctiongener ator.
7. VerificationofcurrentandpowerratingofdifferentwattageResistors.
8. Verificationofdeviationofidealparametersofresistancewithincreaseinfrequency.
9. VerificationofOhm'slawforD.C.andA.C.circuits.
10. VerificationofKVLandKCL.
11. VerificationofThevenin's andNorton'stheorem.
12. VerificationofMaximumPowerTransferTheorem.
13. CalculationofRMS,peaktopeak,averagevalueofanA.C.signalusingDSO/CRO.
14. Toplottheresonancecurveforaseriesandparallelresonance.
15. Measurementofcurrent,voltagesandpowerinR-L-Cseriescircuitexcitedby(singlephase)ACsupply

CourseNo:CSE-1417L

Introduction to Computing Lab

Unit 1: SPREAD SHEETS IN ENGINEERING APPLICATIONS

(a) Getting data into Ms Excel.

(b) Manipulating Data in Ms Excel

(c) Working with Ms excel functions, formulas and charts.

(d) Problem solving using Ms excel

(e) Solving Engineering Problems using Ms Excel

Unit 2: BASIC DATABASES IN ENGINEERING APPLICATIONS.

Ms Access:

(a) Getting data into Ms Access.

(b) Manipulating Data in Ms Access

(c) Problem solving using Ms excel

(d) Solving Engineering Problems using Ms Excel

Unit 3: ALGORITHMS FOR ENGINERRING APPLICATIONS.

(a)Writing Algorithms and drawing g flowcharts using Microsoft word for stated problems.

(-) Testing whether number is prime or not.

(-) Swapping numbers

(-) Sorting numbers

(-) Largest number in an array

(-) Factorial of a number

(-) Depicting engineering problems

(b) LINUX and UNIX commands

CourseNo:MTH-2117

Engineering Mathematics-II

Unit 1

OrdinaryandLinearDifferentialEquations: Formationofordinarydifferentialequations,Solutionoffirstorderdifferentialequationsbyseparationofvariables,Homogeneousequations,Exactdifferentialequations,Equationsreducibletoexactformbyintegratingfactors,Lineardifferentialequationswithconstantcoefficients,Cauchy'shomogeneouslinearequations,Legendre'slinearequations

Unit 2

PartialDifferentialEquations: FormulationandclassificationofPDE□s,Solutionoffirstorderlinearequations,Fourstandardformsofnon-linearequations,Separationofvariablemethodforsolutionofheat,waveandLaplaceequationMatrices:Rankofamatrix,Elementarytransformations,Consistencyandsolutionsofasystemoflinearequationsbymatrixmethods,EigenvaluesandEigenvectors,Properties,Cayley-Hamilton'stheorem

Unit 3

Probability: Basicconceptsofprobability,Typesofprobability:Marginal,jointandconditional,probabilityrules:Addition,Multiplication,complement;Probabilitytree,probabilityunderconditionsofstatisticalindependenceanddependence,Bayes'Theorem.**RandomVariables**

andDistribution: Randomvariables,Probabilitydistribution,Probabilitydensityfunction,Discreteandcontinuousdistributions-Binomial,Poisson,Normaldistributions,Measuresofcentraltendencyanddispersion,Samplingdistribution,standarderror,Centrallimittheorem

Books Recommended

1.   E.Kreyszig,"AdvancedEngineeringMathematics",JohnWiley.
2.   R.K.JainandS.R.K.Iyengar,"AdvancedEngineeringMathematics",NarosaPublishingHouse.
3.   FrankAyres,"Matrices",McGrawHills.
4.   MalikandArrora,"AdvancedMathematicalAnalysis",S.ChandandCo.

CourseNo:CHM-2217

EngineeringChemistry

Unit 1

Electrochemistry: ReductionPotentials,Redoxstabilityinwater,Thediagrammaticpresentationofpotentialdata,Theeffectofcomplexformationonpotentials.Electrolytesandnon-electrolytesolutions,KindsofElectrodes,ConcentrationCells,TheLeadStorageCellandFuelCell.LawsofPhotochemistry,Photophysicalprocesses,FluorescenceandPhosphorescence,Photochemicalreactions:photolysisofHI,PhotochemicalreactionbetweenH2andBr2,RotationalandVibrationalSpectroscopy-Principlesandapplicationtosimplemolecules,magneticResonance**UV-visiblespectrophotometry**:Electronictransitionsandelectronicspectra,Applicationtosimplesystems(AnalysisofFe,Cu,Cr),Bear-lambert'slawanditsapplications.IRspectroscopy−IRspectrum,ApplicationofIRSpectra(Alcohols,Acids,phenols,ConceptofVibrationalSpectra.

Unit 2

EnvironmentalChemistry:Environmentalsegments,compositionofatmosphere,earth'sradiationbalance,particles,Ions,andradicalsinatmosphere,greenhouseeffect,ozonelayerinstratosphere−Itssignificanceandconsequenceofdepletion.**Pollution**:AirPollution,Naturalandman-madepollutants(Cox,NoX,HC,SoX,SpM,Acidrains).Effectofpollutantsonhumanandplantlife.Sourcesandclassificationofwaterpollutants(Organic,Inorganic,Sediments,Radioactivematerials,heat.)

Wateranditstreatment:Alkalinityofwater,DeterminationofAlkalinitybyusingphenolphthaleinandmethylorangeindicators.Hardnessofwater,itstypes,methodsofestimation.Treatmentofwater(Municipaltreatment,limesodaprocess,demineralizationbyionexchangeprocess.

Unit 3

Lubricants:Introduction,surfaceroughness,conceptoffrictionandwear,lubrication,Mechanismofhydrodynamics,boundaryandextremepressurelubrication.Classificationoflubricants,semi-solidandliquidlubricants,blendedoils,syntheticlubricants,Lubricatingemulsions.Propertiesofgreases,liquidlubricantswithspecialreferencetoflashpoint,viscosityandviscosityindex.Criteriaforselectionoflubricantsforspecificpurposes.**InorganicSystems**:TransitionMetals,fundamentalconceptsoftransitionmetalcomplexes,consequencesoforbitalsplitting,colorandmagneticproperties.Structureandbondingoforgano-

metalliccomplexes,thesixteenandeighteenelectronrule.Roleoftracemetalsinbiologicalsystems,oxygen carrier,electrontransfer.

Books Recommended

1. ShriverDFandAtkinAW,"InorganicChemistry",3rdEd.,ELBS,OxfordPress,Delhi(1999).

2. CastellanGW"PhysicalChemistry"3rdEd.,Narosa(1995).

3. Puri,SharmaandKalia"Inorganicchemistry"(2012)

4. Puri,SharmaandPathania"PrinciplesofPhysicalchemistry"(2012)

5. SkoogDA,andHollesFJ,"PrinciplesofInstrumentalAnalysis",5thEd.,HercaurtAsiaPTELtd.,Singapore(2001).

6. HillJW"Chemistryforchangingtimes"6thEd.,Macmillan,Canada(1995).

7. J.C.KuriacoseandJ.Raja   Raman:Chemistryinengineeringandtechnology,VolumeIandII(Tata McGraw Hill Publishing Company Ltd.NewDelhi)

8. P.C.Jain:EngineeringChemistry,(DhanpatRaiandSons,NaiSarak,NewDelhi)

Course:ECE-2317

BasicElectronicsEngineering

Unit 1

SolidStatePhysics:Energybandsandchargecarriersinsemiconductors:energybands-metals-semiconductorsandinsulators-directandindirectsemiconductors-chargecarriersinsemiconductors:electronsandholes-intrinsicandextrinsicmaterial-n-materialandp-material-carrierconcentration:Fermilevel-EHPs-temperaturedependence-conductivityandmobility-driftandresistance-effectoftemperatureanddopingonmobility,HallEffect.Diffusionofcarriers-derivationofdiffusionconstantD-Einsteinrelation-continuityequation-p-njunctions:contactpotential-equilibriumFermilevels-spacechargeatjunctions-currentcomponentsatajunction:majorityandminoritycarriercurrents

Unit 2

Diodes:volt-amperecharacteristics-capacitanceofp-njunctions.Diodeascircuitelement.Halfwavefullwave,Rectifiers:CentreTappedandbridgerectifiers-working-analysisanddesign-Cfilteranalysis-Zenerandavalanchebreakdown-Zenerdiodes:volt-amperecharacteristics-regulatedpowersupplies-ICbasedregulatedpowersupplies.Tunneldiodes:tunnelingphenomena-volt-amperecharacteristics-Varactordiodes-Photodiodes:detectionprinciple-lightemittingdiodes-volt-amperecharacteristics.

Unit 3

Transistors: BipolarjunctiontransistorsNPNandPNPtransistoraction-opencircuitedtransistor-biasinginactiveregion-majorityandminoritycarrierdistribution-terminalcurrents-operation-characteristics-TypesofTransistorConfigurations:-CE,CBandCCconfigurations.TransistorasAmplifier.Fieldeffecttransistors:operation-pinchoffandsaturation-pinchoffvoltage-gatecontrol-volt-amperecharacteristics.MOSFETSn-channelandp-channel.Depletionandenhancementmodes.

Books Recommended

1.   SolidStateElectronicDevicesbyB.G.Streetman,PrenticeHallofIndiaLtd,N.Delhi,5thEdition,2OOO.

2. ElectronicdevicesandcircuitsbyR.BoylstedandL.Nashelsky,PrenticeHallPublications,7thEdition.

3. ElectronicdevicesbyFloyd,PearsonEducation,7thEdition,2008.

4. ElectronicPrinciples:Malvino-TataMcGrawHill.

CourseNo:CSE-2417

ComputerProgramming

Unit 1

IntroductiontoCLanguage—Brush-upofalgorithmsandflowcharts.Characterset,VariablesandIdentifiers,Built-inDataTypes,VariableDefinition,ArithmeticoperatorsandExpressions,ConstantsandLiterals,Simpleassignmentstatement,Basicinput∕outputstatement,SimpleCprogramsConditionalStatementsandLoops-Decisionmakingwithinaprogram,Conditions,RelationalOperators,LogicalConnectives,*if*statement,*if-else*statement,Loops:*while*loop,dowhile,*for*loop,Nestedloops,Infiniteloops,S*witch*statement,structuredProgramming.

Unit 2

Arrays-Onedimensionalarrays:Arraymanipulation;Searching,Insertion,Deletionofanelementfromanarray;Findingthelargest∕smallestelementinanarray;Twodimensionalarrays,Addition∕Multiplicationoftwomatrices,Functions-Modularprogrammingandfunctions,StandardLibraryofCfunctions,Prototypeofafunction:Formalparameterlist,ReturnType,Functioncall,Blockstructure,PassingargumentstoaFunction:callbyreference,callbyvalue,RecursiveFunctions,arraysasfunctionarguments.

Unit 3

StructuresandUnions-Structure,nestedstructure,structuresandfunctions,structuresandarrays:arraysofstructures,structurescontainingarrays,unions,**Pointers-**Addressoperators,pointertypedeclaration,pointerassignment,pointerinitialization,pointerarithmetic,functionsandpointers,ArraysandPointers,pointerarrays.FileProcessing-ConceptofFiles,Fileopeninginvariousmodesandclosingofafile,Readingfromafile,writingontoafile.IntroductiontoObjectOrientedProgrammingwithC++.ObjectsandClasses.Objecthierarchy.Inheritance,Polymorphism.IntroductiontoAdvancedC∕C++Compilersviz.Ellipse∕Netbeans.

Books Recommended

1. E.Balaguruswamy,"ProgrammingwithANSI-C"

2. ByronGottfried"ProgrammingwithC"

3. Kamthane,"ProgrammingwithANSIandTurboC"

4. H.Schildt,"C++:TheCompleteReference"

5. B.Stroustrup,"TheC++ProgrammingLanguage"

CourseNo:MEE-2517

EngineeringMechanics

Unit 1

Systemofforces: Coplanarconcurrentforcesystem,CompositionandResolutionofforces,Equilibriumofrigidbodies,Freebodydiagram,Lami's Theorem.

StressandStrain:ConceptofStressandStrain,SimpleStresses,Tensile,Compressive,   Shear, BendingandTorsion,Stress-

StrainCurves,Elongationofbars,Compositebars,ThermalStresses,ElasticConstants,Mohr's Circle

Unit 2

CentreofGravityandMomentofInertia:ConceptofC.G.andCentroid,PositionofCentroid,TheoremofParallelandPerpendicularAxes,Momentofinertiaofsimplegeometricalfigures.AnalysisofFramedStructure: Reactionindifferenttypesofbeamswithdifferentendconditions,bendingmomentandshearstressdiagrams.Determinationofreactionsinmembersoftrusses:using a)AnalyticalMethodsb)GraphicalMethod.

Unit 3

PhysicalPropertiesoffluids:System,Extensiveandintensiveproperties:specificweight,massdensity,specificgravity,viscosity,specificgravity,surfacetensionandcapillarity,**e**vaporabilityandvaporpressure**,**Newtonianand Non-

Newtonianfluids.**FluidsStatics:**Pressure,Hydrostaticlaw,Pascal□slaw,Differenttypesofmanometerand otherpressuremeasuringdevices,Determinationofmetacentricheight.**FluidKinematicsandDynamics**: Classificationoffluids,Streamline,StreaklineandPathlines,FlowrateandcontinuityequationBernoulli's Theorem,KineticenergycorrectionfactorandmomentumcorrectionfactorinBernoulli's equation.

BooksRecommended

1. BhavikattiSSandRajashekarappaKG,*"EngineeringMechanics",*NewAgeInternational,NewDelhi(1998).

2. TimoshenkoSPandYoungDH,"*EngineeringMechanics*",McGrawHill(International)4/e,NewDelhi (1984).

3. Kumar DS, "*Fluid Mechanics*", S.K. Katira and Sons, Delhi (1998).

4. Modi PN and Seth SN, "*Fluid Mechanics*", Standard Book House, New Delhi (1998),

5. Engineering Mechanics by R.S. Khurmi

CourseNo:CHM-2217L

EngineeringChemistryLab

Thestudentsarerequiredtoconductexperimentsonfollowingpracticalwork:

1. TodrawthepH‑titrationcurveofstrongacidvs.strongbase

2. StandardizationofKMnO4usingsodiumoxalate.

3. DeterminationofFerrousironinMohr'ssaltbypotassiumpermanganate.

4. Determinationofpartitioncoefficientsofiodinebetweenbenzeneandwater.

5. Determinationofamountofsodiumhydroxideandsodiumcarbonateinamixture

6. DeterminationoftotalhardnessofwaterbyEDTAmethod.

7. ToverifyBear'slawforacoloredsolutionandtodeterminetheconcentrationofagivenunknownsolution.

8. SynthesisofsomepolymerslikeCrazyball.

CourseNo:CSE-2417L

ComputerProgrammingLab

Note:ExperimentsandprogramstobeperformedonvariedplatformslikeLinux,Windows,Arduino,Ras pberryetc.

1. ProgramonControlStructuresandDecisionmakingstatements.
2. ProgramusingLoops.
3. ProgramusingSwitchcasestatementswithuseofbreak,continueandgoto.
4. Programsonarrayoperations.
5. Programsonmatrixoperationsandmanipulations.
6. Programsonmodularprogrammingandfunctions.
7. Programsonrecursivefunctions.
8. Programsonstructuresandunions.
9. Programsonpointersandtheirmanipulations.
10. Programsonfiles.

1. Characterizevariouscommercialdiodesonthebasisofvoltageandcurrentratings.Study∕simulationof theirI‑Vcharacteristicsusingmultisim∕pSpice.,

2. CharacterizevariouscommercialZenerdiodesonthebasisofvoltageandcurrentratings,Study∕simul ationofI‑VcharacteristicsofZenerDiode.

3. StudyofI‑VcharacteristicsofaLightemittingDiode.

4. Designofcurrentlimitingresistorsfordifferentinputvoltages.

5. Toassemble∕simulateahalfwaverectifierusingpowerdiodesandLEDsandstudytheirperformance

6. Toassemble∕simulateacentertappedfullwaverectifierusingpowerdiodesandLEDsandstudytheirpe rformance

7. Toassemble∕simulateabridgewaverectifierusingpowerdiodesandLEDsandstudytheirperformanc e

8. Study∕simulationofdiodeapplicationslikeclippers,clampers,protectioncircuits.

9. StudyofZenerdiodesasvoltageregulators.

10. DesignofanICbasedVoltageregulator.

11. StudyV‑ Icharacteristicsoftransistor(PNPandNPN).Calculatetheperformanceparametersoftransistor.

12. UseNPNtransistorasaninverterswitch.

CourseNo:MEE-2617W

Workshop Practice

1.MachiningSection

(a)TheoreticalInstructions:

SafetyPrecautions,WorkingprincipalofMilling,Shaper,Slotter,Grinding,powerhacksawandotherrelated metalcuttingmachine.Basicoperationsofvariousmachines.Introductionofvarioustypesofcuttingtools（N omenclature）.

(b)PracticalDemonstrations:

Demonstrationofknurlingthreadcutting,boring,etc.onlathemachine,

SimpleoperationsonMilling,Shaper,Slotter／plannerandgrindingmachines.

Simplejobsinvolvedallthebasicoperationsonshaper,millingandgrindingmachines.

Aim: To prepare a cylindrical job on lathe for manufacturing of a gear on milling machine.

2.SheetMetalandSprayPaintingsection:

(a)TheoreticalInstructions:

SafetyPrecautions,Soldering,brazingandshearing,fluxesinuseandtheirapplications,studyofmaterialus edforpainting,knowledgeofdifferentmachinessuchasshearing,bending,wiringandpowerpresses,metho dofpatterndevelopmentindetail,studyofaircompressorandairguns-

itsuse,care,maintenanceandoperatinginstructions.Advantagesofspraypainting,Knowledgeofdifferents heetmetalsmaterials.

(b)PracticalDemonstrations:

Exerciseinrating,solderingandbrazingofmakingjobsofvariousmaterialssuchasTrays,Flowervases,phot oframeetc.preparationofsurfacesforpaintingbyusingaspraygunwiththehelpofaircompressor.

Aim:To develop a funnel as per the drawing with soldering.

3.FittingandBenchworksection:

(a)TheoreticalInstructions:

SafetyPrecautions,Introductionofcommonmaterialsusinginfittingshop,descriptionanddemonstrationof variousworkholdingdevicessuchassurfaceplateandV-

block,IntroductionanduseofmeasuringtoolslikeVerniercaliper,micro-

meter,heightgauge,profileprojector,surfaceroughnesstesterandothergauges.

（**b)PracticalDemonstrations:**

Demonstrationofangularcutting,practiceof45O,preparationofstudtocutexternalthreadswiththehelpofdi es,drilling,countersinking,counterboringandinternalthreadcuttingwithtaps,pipecuttingpracticeandthrea dcuttingonG.Ipipewithpipedies.DemonstrationofTapsetsandmeasuringequipments.

Aim:To assemble the mild steel work pieces with radius fitting.

4.WeldingSection:

(a)TheoreticalInstructions:

SafetyPrecautions,IntroductionofallweldingprocesseslikeGaswelding,MIGWelding,TIGwelding,Submergedarcweldingandspotwelding,Advantagesanddisadvantagesoverelectricarcweldingandtheirapplications.Weldingtechniqueslikerightward,leftwardandoverhead,variousfluxesandelectrodesusedinwelding.DifferencebetweenACandDCwelding.Characteristics,sizeandclassofelectrodes.

(b)PracticalDemonstrations:

Demonstrationofdifferenttypesofjointsbyusinggasweldingandarcweldingetc.

Aim:To make v-butt joint, out-side corner joint and head tee -joint.

5.FoundryandCastingSection:

(a)TheoreticalInstructions:

SafetyPrecautions,Introductiontocastingprocesses,basicstepsincastingprocesses,typesofpattern,allowances,risers,runners,gates,mouldingsandanditscomposition,Sandpreparation,mouldingmethods,Coresandandcoremaking,mouldassembly,castingdefectsandremedies.IntroductionofCupola.Varioustestofmouldingsandlike,shatterindextest,moisturecontenttest,grainfinenesstestetc.

(b)PracticalDemonstrations:

Demonstrationandpracticeofmouldmakingwiththeuseofsplitpatternsandcores,sandpreparationandtesting,castingpracticeofvariousmaterialslikebrass,alluminuim,waxesetc.byusingdifferenttypesofpatterns

Aim:To prepare a green sand moulds by using split and self-cored patternfor casting.

6.SmithyAndForgingSection:

(a)TheoreticalInstructions:

SafetyPrecautions,Introductionofvariousforgingmethodslikehandforging,dropforging,pressforgingandmachineforginganddefects,briefdescriptionofmetalformingprocesses,comparisonofhotandcoldworking.Introductionofforgingmachinessuchasforginghammerandpresses.

(b)PracticalDemonstrations:

DemonstrationandpracticeofMSrodintoforgedMSringandoctagonalcrosssection.

Aim:To prepare a square headed bolt from ms-round.

7.CarpentryandPatternMakingSection:-

(a)TheoreticalInstructions:

SafetyPrecautions,Introductionofwood,differentmethodsofseasoning,qualityofgoodtimber,woodworkingmachineslikebandsaw,circularsaw,jigsaw,lathe,grinder,thicknessplanningmachine,mortoisemachineandradialsaw.

(b)PracticalDemonstrations:

Demonstrationandpracticeofdifferenttypesofjoints,technicaltermsrelatedtojoinerytheirdescription,identificationandapplication.Polishing,puttingandmaterialuse,theirnames,ingredients,methodsofpreparationanduse,joiningmaterialslikenuts,screws,dovels,hinges,glue,windowandrooftrusses.

Aim:To prepare a scarf joint and pen stand as per the drawing.

8.ElectricalandElectronicsSection:

(a)TheoreticalInstructions:

SafetyPrecautions,Introductionofdifferenttypesofwiring,circuitbreakers,protectiverelays.powersupply, systemanditstypes.Varioustypesofcircuits,electrificationofaworkshop.Polaritytest,earthing.electricalsymbols.

Solderingtechniqueofacircuitboardandsolderingjointquality.

(b)PracticalDemonstrations:

Demonstrationandpracticeoftransformer,extensioncord,geyser,electricalmotor.

Aim:house wiring, staircase wiring for fluorescent tube light, three phase wiring for electrical motors.to mass soldering of printed circuit boards as per the instructions.

Booksrecommended:

1. WorkshopTechnologybyChapman.
2. WorkshopTechnologybyHajraChowdhary.
3. WorkshopTechnologybyVirenderNarula.

Course No: MTH-3117

Discrete Mathematics

Objective:Theobjectiveofthiscoursetounderstandtheconceptofsets,relations,propositionallogic,grapht heory,solvinggraphproblemsandintroducetothebasicconceptsoftressandgrouptheory.

Unit 1

Relations: Sets,productsets,relations,representationofrelations,compositionofrelations,partitions,equi valencerelations.

OrderedSetsandLattices: Orderedsets,diagramofpartiallyorderedsets,SupremumandInfimum,wellord eredsets,lattices,boundedandcomplementedlattice,and distributivelattice.

PropositionalCalculus: Statements,basicoperations,truthvalueofcompoundstatements,algebraofprop ositions,tautologiesandcontradiction,conditionalandbi-

conditionalstatements,logicalimplications,logicalequivalence,predicates,universalandexistentialquant ifiers.

Unit 2

GraphTheory: Graphsandmulti-

graphs,degreeofavertex,pathsconnectivity,cutpointsbridges,walks,paths,cycles,connectedgraphs,bip artite,regular,planarandconnectedgraphs,components,Eulergraphs,Euler'stheorem,Hamiltonianpath andcircuits,graphcoloring,chromaticnumber,isomorphismandhomomorphismofgraphs,Konigsbergsev enbridgeproblem,shortestpath.

Trees: Propertiesoftrees,pendantverticesintrees,degreesequencesintrees,necessaryandsufficientcon ditionsforasequencetobeadegreesequenceofatree.

Unit 3

GroupTheory: Groups,semigroup,infinitegroup,finitegroup,orderofagroup,Abeliangroup,subgroup,ne cessaryandsufficientconditionforasubsettobeasubgroupofagroup,Lagrange'stheorem,cosets,normals ubgroups,orderofanelementofagroup,cyclicgroup.Rings,homomorphismandisomorphismofrings.

BooksRecommended:

1. ElementsofDiscreteMathematicsbyC.L.Liu,2ndEd.TataMc-GrawHill.

2. DiscreteMathematicalStructers,Kolman,BusbyandRoss,6thEd.PHI(2009).

3. NarsinghDeo:GraphTheorywithApplicationstoEngineeringandComputerSciences,PHI.

4. MurryR.Spiegel:DiscreteMathematics(SchaumsOutlineseries)TataMcGrawHill(2009).

5. KennethH.Rosen:DiscreteMathematicsanditsapplications,5thEd.TataMcGrawHill.

6. K.RParthasarty:basicGraphTheory,TataMc-GrawHill.

CourseNo:CSE-3217

ObjectOrientedProgrammingin C++

Objective:Theobjectiveofthiscourseistomakeastudentunderstandthebasicapproachofobjectorientedto designsoftware,implementationofprogramsusingclassesandobjects.Specifytheformsofinheritanceand usetheminprogramsandintroducetheconceptofpolymorphicbehaviourofobjects.

Unit 1

Introduction: BasicfeaturesandconceptsofObjectOrientedProgramming(OOP),languagesandapplicationsofoops.

Tokens,ExpressionsandControlStatements: Tokens,Keywords,identifiersandconstants,basicdatatypes,userdefineddatatypes,deriveddatatypes,memorymanagementoperators,manipulators,expressions,controlstructures.

FunctionsinC++: Functionprototyping,callbyvalue,inlinefunctions,defaultfunctions,callbyreference,.Call by Address

Unit 2

ClassesandObjects: Specifyingclass,definingmemberfunctions,privatememberfunctions,arrayswithin class,memoryallocatingforobjects,arraysofobjects,objectsasfunctionarguments,returningobjects,pointerstomembers,function overloading, Friend Function.

ConstructorsandDestructors: Constructors,parameterizedconstructors,constructorswithdefaultarguments,dynamicinitializationofobjects,dynamicconstructorsanddestructors.

OperatorOverloadingandTypeConversion: Definitionandrulesofoverloadingoperators,OverloadingBinaryandUnaryOperators.

Unit 3

Inheritance: Single,multilevel,multiple,hierarchicalandhybridinheritance,virtualbaseclasses,   derived classes.

Pointers,VirtualFunctionsandPolymorphism: Pointers,pointerstoobjects,andvirtualfunctions,purevirtualfunctions,abstract classes.

Exception Handling, Templates: Classtemplates,functiontemplates.

FilesandI/Ostreams: Workingwithfiles,streaminput∕outputclassesandobjects.

BooksRecommended:

1. ObjectOrientedProgrammingusingC++,EBalagurusamy.

2. ObjectOrientedProgramminginTurboC++,RobertLafore.

3. AStructuredApproachusingC++,FarouzanandGilber.

4. ObjectOrientedProgrammingwithC++,RSSalaria.

Course No: CSE-3317

Data Structures using C

Objective:Tounderstandthebasicsofdatastructures,varioustechniquesofsortingandsearching,todesig nandimplementarrays,stacks,queues,andlinkedlistsandtounderstandthecomplexdatastructuressucha streesandgraphs.

Unit 1

Introduction: Basicconceptofdata,structuresandpointers.

Arrays: Representation,implementation,polynomialrepresentation,limitations.

Strings: Representation,stringoperations,implementingString.hlibraryfunctions.

LinkedList: Staticanddynamicimplementation,single,double,circular,multiplelinkedlists.

Unit 2

Stack: RecursionandStacks,staticanddynamicimplementation,expressionevaluation,infix,postfixexpressions.

Queues: Staticanddynamicimplementationofqueue,circularqueueandimplementation.

Hashtable: Implementation,hashingtechniques,single,double.

StorageManagement: MemoryManagementtechniques,garbagecollection.

Unit 3

Trees: Binarytrees,binarysearchtrees,staticanddynamicimplementation,treeoperations,insert,delete,andsearch,AVLtress.

Heap: Introduction,Implementation,heapsorting.

SortingandSearching: Differentsortingtechniques-
insertionsort,selectionsort,bubblesort,radixsort,quicksort,mergesort,heapsort,linearsearch,binarysearch.

Graphs: Representationofgraphs,BFS,DFS.graphalgorithms.

BooksRecommended:

1. DataStructuresbyRajniJindal.

2. DataStructures,Schaum'sSeries.

3. DataStructuresbyKnuth.

4. DataStructuresbyFarouzan.

5. DataStructuresusingCandC++byLangsam,Augestern,Tanenbaum.

Course No: ECE-3417

Network Analysis and Synthesis

Objective:Theobjectiveofthiscourseistounderstandofthebasicconceptsofcircuits∕networks,solutionso fnetworksusingdifferenttechniques,networktheorems,parametersinatwoportnetworkandtointroduceth econceptoffilters.

Unit 1

DevelopmentoftheCircuitsConcept: Chargeandenergy,capacitance,inductanceandresistanceparam eters,approximaterealizationofaphysicalsystemasacircuit.

ConventionsforDescribingNetworks: Referencedirectionsforcurrentsandvoltages,magneticallycoupl edcircuits,circuittopology.

FirstOrderDifferentialEquations: Differentialequationsasappliedinsolvingnetworks,applicationofinitial conditions,evaluatinginitialconditionsinnetworks.

LaplaceTransformation: SolutionsofNetworkproblemusingLaplaceandHeaviside'sexpansiontheorem .

Unit 2

WaveformAnalysisandSynthesis: Theunitstep,rampandimpulsefunctionsandLaplacetransforms.Initia landfinalvaluetheorem,convolutionintegral,convolutionassummation.**NetworkTheoremsandImpedan ceFunctions:**Complexfrequency,transformerimpedanceandtransformcircuits,seriesandparallelcombi nationofelements,Fostersreactancetheoremandreciprocitytheorem.

NetworkFunctions-

PolesandZones: Portsofterminalpairs.Networkfunctionsforoneportandtwoportnetwork(ladderandgen eralnetworks).Polesandzerosofnetworkfunctions,restrictiononpoleandzerolocationsfordrivingpointan dtransferfunction,timedomainbehaviorfrompolezeroplot.

Unit 3

TwoPortParameters: Relationshipbetweentwo-

portparameters,admittance,impedance,transmissionandhybridparameters,relationshipbetweenpara

metersets,parallelconnectionoftwoportnetworks,characteristicimpedanceoftwoportnetworks.

Filters: Filterfundamentals‐passandstopband,filterclassification,constant‐kandm‐

derivedfilters,behaviorofcharacteristicimpedanceoverpassandstopbandsdesignoffilters.

BooksRecommended:

1. NetworkAnalysisbyVanValkenberg
2. NetworkAnalysisandSynthesisbyF.Kuo

Course No: ECE-3517

Course Name : Signals and Systems

Objective: *The objective of this course is to understand the various classification of both continuous and discrete time signals and systems, analysis of signals using Laplace Transform and Fourier Transform, analysis and characterization of the discrete signals through Fourier and Z-transform. Use probabilistic characterizations of random signals and noise, and measurements derived from these signals.*

Unit 1

Introduction to Signals: Classification of signals - deterministic, non-deterministic, periodic, aperiodic, even, odd signals, energy, power, elementary, exponential, sinusoidal, impulse, step, ramp, pulse, square wave signals.

Basic Operations on Signals: Time shifting, time scaling, time inversions of signals.

Basic Properties of System: causality, time invariance, stability, linearity, memory, order of system, interconnection of systems.

LTI Systems: Linear time invariant systems, characterization, Unit 1mpulse response, convolution, properties of LTI systems.

Unit 2

Fourier analysis of signals and systems: Fourier series of periodic signals and its properties, Fourier transform of aperiodic signals and its properties, Fourier transform of periodic signals, convolution in time and frequency domain, energy and signals, parsevals theorem, energy spectral density and its properties, Transfer function of LTI system.

Laplace Transform: Relation between Laplace and Fourier transforms, region of convergence, properties of Laplace transform, initial and final value theorems, convolution, transfer function of LTI system, concept of poles and zeroes, stability criteria.

Z-Transform: Region of convergence, inverse Z-Transform, transform analysis of discrete time LTI systems.

Unit 3

Random Variable Theory and Random Signals: Probability, conditional probability, statistical independence, random variables, discrete and continuous random variables, probability distribution and probability density functions, statistical averages of random variables, some important density functions.

RandomProcessesandCharacterization: Ensembleandtimeaverages,stationaryandnon-stationaryrandomprocess,widesensestationeryrandomprocess,autocorrelationandcrosscorrelationfunctions,responseofLTIsystemstorandominputs,noiseanditstypes,whitenoise,signaltonoiseratioofLTIsystems.

BooksRecommended:

1. SignalsandSystemsbyZieman,Tranter,Fannin.
2. SignalsandSystemsbySanjaySharma.
3. SignalsandSystemsbyAPopulis.
4. RandomprocessesandSystemsbyAPopulis.
5. SignalsandSystemsbyS.Hykin.

Course No: CSE-3217L

Object Oriented Programming in C++ Lab

1. SimpleclassdesigninC++,namespaces,objectscreations

2. ClassdesigninC++usingdynamicmemoryallocation

3. Function overloading, default arguments in C++

4. Constructor,Destructor.

5. Operatoroverloading,friendfunctions

6. Overloadingassignmentoperator,typeconversions

7. Inheritance,run-timepolymorphism

8. TemplatedesigninC++

9. Exceptionshandling

10. File handling.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec
ontents.

Course No: CSE-3317L

Data Structures using C Lab

Basicconceptsofdata,linearlists,strings,arraysandorthogonallists,representationoftreesandgraphs,sto ragesystems,arrays,recursion,Stacks,Queues,Linkedlists,Binarytrees,GeneralTrees,TreeTraversal,S ymbolTableandSearchingTechniques,SortingTechniques,graphs.

1. Implementsinglyanddoublylinkedlists.

2. Representapolynomialasalinkedlistandwritefunctionsforpolynomialaddition.

3. Implementstackanduseittoconvertinfixtopostfixexpression

4. Implementarray-basedcircularqueue.

5. Implementanexpressiontree.Produceitspre-order,in-order,andpost-ordertraversals.

6. Implementbinarysearchtree.

7. Implementpriorityqueueusingheaps

8. Implementvarioussortingtechniquesastaughtinclass.

9. ImplementDijkstra'salgorithm

10. ImplementPrim'sandKruskal'salgorithms

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec ontents.

Course No: ECE-3417L

Network Analysis and Synthesis Lab

1. StudyofCRO-MeasurementofVoltagefrequencyandPhaseofagivenwaveform.

2. ToassembleRCcircuitsandobserveitsperformanceinlowpassandhighpassmode.

3. Toassembleaseriesandparallelresonantcircuitandobservetheirfrequencyresponse.

4. Tomeasureimpedanceandbandwidthofaparalleltunedcircuitandobtainitsqualityfactor.

5. TomeasureimageandcharacteristicimpedanceofasymmetricalTeeandPinetworks.

6. Foragiventwoportnetworkmeasure:

    i)   ABCDparameters.

    ii) h-parameters.

7. Toexperimentallydeterminethecharacteristicimpedanceandtoplottheattenuationcharacteristicsoft hefollowingcircuits.

    i)   Prototypelowpassfilter.

    ii) Prototypehighpassfilter.

    iii) Prototypeband-passfilter.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec ontents.

CourseNo:MTH-4117

ProbabilityStatisticsandQueuing

*Objective:*Theobjectiveofthiscourseistomakeastudentunderstandthefundamentalconceptsofprobabilit yandstatistics,theoremsofprobabilitytheory,andtounderstandelementaryqueuingconcepts.

Unit 1

Measuresofcentraltendencyandmeasuresofvariations(dispersions),moments,measuresofskewnessa ndkurtosis.Randomexperiment,samplespace,events,classicalstatisticalandaxiomaticdefinitionsofprob ability.Statementsandproofoftheoremsonadditionandmultiplicationofprobabilities,simpleproblems.Bay eʹstheoremonconditionalprobability.

Unit 2

Randomvariables,derivationofformulaeformeanvarianceandmomentsofrandomvariablesfordiscretean dcontinuouscases.Lawsofexpectation,Binomial,Poissonandnormaldistributions,betaandgammadistri bution,t-distribution,F-Distribution,Chi-squaredistributionandtheirapplications.Methodsofleastsquares,fittingastraightlineandparabolaofdegre e-p.Regressionandcorrelation.Multipleandpartialcorrelation.

Unit 3

MarkovChainandReliability:Markovchain,transitionprobabilities,Limitingdistributions,conceptsofreliabi lity.IntroductiontoQueuingTheory:Markovianqueuingmodels,Littleʹsformula,applicationofqueuingtheor y,M/M/1Model.

BooksRecommended:

1. MillerandFreadʹsProbabilityandstatisticsforengineers-
   RichardAJohnson,PearsonEducationAsia/PHI.

2. FundamentalsofMathematicalStatistics-
   S.C.GuptaandV.K.Kapoor,SultanandSons,EasternEconomyEdition

3. IntroductiontoMathematicalStatistics-CraigandHogg,Pearson.

4. ProbabilityandStatisticsWithReliability,QueuingWithReliability,QueuingandComputerScienceApplicationbyKishorS.Trivedi,PHI.

CourseNo:CSE-4217

AnalysisandDesignofAlgorithms

Objective:Tounderstandtheimportanceofalgorithmanditscomplexity,toanalyzethecomplexityofanalgorithmintermsoftimeandspacecomplexities,todesignandimplementvariousprogrammingparadigms.

Unit 1

Introduction: Algorithmdesignparadigm,motivation,conceptofalgorithmicefficiency,runtimeanalysisofalgorithms,asymptomaticnotationsandrecurrencerelations.

DivideandConquer: Structureofdivideandconqueralgorithms,examples-

binarysearch,quicksort,analysisofdivideandconquer.

GreedyMethod: Overviewofthegreedyparadigm,examplesofexactoptimizationsolution(minimumcostspanningtree),approximatesolution(Knapsackproblem),singlesourceshortestpaths.

Unit 2

DynamicProgramming: Overview,differencebetweendynamicprogramminganddivideandconquer,applications-

shortestpathingraph,matrixmultiplication,travellingsalesmanproblem,longestcommonsequence.

GraphSearchingandTraversal: Overview,traversalmethods,depthfirstandbreadthfirstsearch.

Unit 3

Backtracking: Overview,8-queenproblemandKnapsackproblem.

BranchandBound:LCsearching,bounding,FIFObranchandbound,applications-

0/1Knapsackproblem,Travellingsalesmanproblem.

ComputationalComplexity: Complexitymeasures,Polynomialvsnon-

polynomialtimecomplexity,NPhardandNPcompleteclasses,examples.

BooksRecommended:

1. IntroductiontoalgorithmsbyCormen,Leiserson,Rivest,Stein:

2. Fundamentalsofcomputeralgorithmsby E.HorowitzandSahni.

3. TheDesignandAnalysisofComputerAlgorithmsbyAho,Hopcraft,Ullman,PearsonEducation

4. AlgorithmDesignbyGoodRichandTamassia,wileystudentedition.

Course No: ECE-4317

Digital Electronics

Objective: Theobjectiveofthiscourseistounderstandtheessentialknowledgeonthefundamentalsofnumb ersystem,Booleanalgebra,digitalcircuitsandconceptonthedesignprinciplesofdigitalcomputingsystems.

Unit 1

NumbersystemandCodes: Binary,Octal,Hexadecimalnumbersystemsandtheirinter-conversion,BinaryArithmetic,BCDcodes,8421code,Excess-3code,Graycode,errordetectionandcorrection-Hammingcode.

LogicGatesandBooleanAlgebra: BasictheoremsandpropertiesofBooleanalgebra,Booleanfunctions,CanonicalandStandardformsofBooleanexpressions,Digitallogicgates.

LogicFamilies: TTLandECL,MOS,CMOSdevices(workandcharacteristics).

BooleanFunctionSimplification: TheKarnaughmap(K-map)method,QuineMcCluskeytabulationmethod.

Unit 2

CombinationalCircuits: Combinationalcircuitdesign,designofhalfadder/subtractor,fulladder/subtractor.

DesignofEncodersandDecoders: Priorityencoders,BCDtodecimaldecoder,BCDtosevensegmentdisplaydecoder,designofMultiplexers(MUX).

PLA,PAL: ProgrammableLogicArrays,ProgrammableArrayLogic,implementationofcombinatoriallogicusingthesedevices.

SemiconductorMemories: Introduction,memoryorganization,sequentialmemories,ROMs,RAMs,contentaddressablememories,designofmemorymodules.

Unit 3

SequentialCircuitDesign: Flipflopanditstypes,flip-flopcharacteristicandexcitationtables,conversionofflip-flops.

CountersandRegisters: Designofshiftregisters,universalshiftregister,anddesignofasynchronouscounters-Ripplecounters,Mod(N)counters,sequencedetectors,designofvarioussynchronouscounters-statediagramsandtruthtables.

BooksRecommended:

1. MalvinoandLeach"DigitalprinciplesandApplications"TataMcGrawHill.

2. JainRP"ModernDigitalElectronics",TataMcGraw-Hill.

3. ManoMMorris,"DigitalDesign"PearsonEducation.

4. JamesW.BignellandRobertDonovan,"DigitalElectronics".

5. Flecther"AnEngineeringApproachtoDigitalDesign",PrenticeHallofIndia.

Data Communication

*Objective:*Theobjectiveofthiscourseistounderstanddifferentmodulationanddemodulationtechniques,conceptofdigitalcommunication,datatransmissiontechniques,noiseanditsanalysis.

Unit 1

Modulation: Introduction,overviewofcommunicationsystem,communicationchannel,needformodulation,basebandsignals.

Modulationtypes: Amplitudemodulation(DSB-FC),Doublesidebandsuppressedcarrier(DSB-SC),SingleSidebandmodulation(SSB),Vestigialsidebandmodulation(VSB),Anglemodulation,FrequencyandPhasemodulation,NBFM,WBFM.

Demodulation: BlockdiagramofAMandFMtransmittersandreceivers.

Unit 2

DigitalCommunication: Sampling,Quantization,quantizationerror,coding,pulsecodemodulation,differentialPCM,ADPCM,Relativeadvantagesanddis-advantages,Deltamodulation,PWMandPPM,FrequencyDivisionMultiplexing(FDM),TimeDivisionMultiplexing(TDM).

BinaryTransmissionSystems: ApplicationsandtypesASK,FSK,PSK,M-FSKDPSK,QPSK,QAM,DSL,ADSLschemes.

Unit 3

Introduction: Channels,bandwidth,transmissionmedia.

DataTransmissionTechniques:simplex,halfduplex,fullduplex,synchronousandasynchronous.Linecodingtechniques.Datarate,bandwidth(Shannon'stheorem),baudrate.

Errors: Types,detectionandcorrectiontechniques.

Noise:types,noiseanalysisofAMandFM,pre-emphasis,de-emphasisandSNRimprovement.

BooksRecommended:

1. PrinciplesofCommunicationSystemsbyTaubandSchelling

2. ElectronicCommunicationSystemsbyG.Kennedy

3. CommunicationsystemsbyS.Haykins

CourseNo:MTH-4517

NumericalMethods

Objective:Theobjectiveofthiscourseistointroducestudentstothevariousnumericaltechniques,whichfind theirapplicationsinalmosteverysphereofScienceandEngineering.

Unit 1

Solutionforlinearandnonlinearequations:

Algebraicequations:Bisectionmethod.Regula-Falsimethod.NewtonRaphsonMethod.Secantmethod.

Solutionforsystemsofequations:

BasicGaussEliminationmethod,GaussEliminationwithPivoting,GaussJordanmethodforlinearsystemof equations.

Unit 2

Interpolation:

Meaningof□,E,μand□.Forwarddifference,Backwarddifference,andCentraldifference,Newton'sformula. Lagrange'sInterpolationformula.Sterling'sandBessel'sformula.

Unit 3

NumericalIntegrationandDifferentiation:

Introduction.Newton-
CotesMethods:Trapezoidalrule,Simpson's1/3rule,Simpson's3/8rule.GaussianIntegration.

DifferenceEquationsandtheirsolutions:

One-
stepmethods:Taylorseriesmethods,Euler'smethod,RangeKuttamethod.PredictorCorrectormethods:M ilne-Simpsonsmethod,AdamsBashforthmethod.

BooksRecommended:

1. NumericalMethods,E.Balaguruswamy,TMH.

2. IntroductiontoNumericalMethods,V.Rajaraman,TMH.

3. AppliedNumericalMethodsforEngineersusingMATLABandC,Schilling,CengageIndia.

4. NumericalMathematicsandComputing,Cheney,CengageIndia.

5. NumericalmethodsforengineersbyChapraandCanale,5thedition,TataMcGrawHill.

Course No: CSE-4217L

Analysis and Design of Algorithms Lab

1. SortagivensetofelementsusingtheQuicksortmethodanddeterminethetimerequiredtosorttheelements.

2. ObtaintheTopologicalorderingofverticesinagivendigraph.

3. ImplementO⁄1KnapsackproblemusingDynamicProgramming.

4. Fromagivenvertexinaweightedconnectedgraph,findshortestpathstoootherverticesusingDijikstra☐salgorithm.

5. FindMinimumCostSpanningTreeofagivenundirectedgraphusingKruskal☐salgorithm.

6. PrintallthenodesreachablefromagivenstartingnodeinadigraphusingBFSmethod.

7. CheckwhetheragivengraphisconnectedornotusingDFSmethod.

8. FindasubsetofagivensetS=｛sl,s2,......,sn｝ofnpositiveintegerswhosesumisequaltoagivenpositiveintegerd.Forexample,ifS=｛1,2,5,6,8｝andd=9.

9. ImplementandfindtheoptimalsolutionfortheTravelingSalespersonproblem.

10. FindMinimumCostSpanningTreeofagivenundirectedgraphusingPrim˒salgorithm.

11. ImplementAll-PairsShortestPathsProblemusingFloyd˙salgorithm

12. ImplementNQueen˙sproblemusingBackTracking..

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursecontents.

1. VerificationofthetruthtablesofTTLgates(7400,7402,7404,7408,7432,7486).

2. VerifytheNANDandNORgatesasuniversallogicgates.

3. TorealizeAND,ORgatesusingdiodesandresistors(Logicfamilies).

4. ToverifyDe-Morganslawusinglogicgates.

5. DesignandVerificationofthetruthtableofhalfandfulladdercircuits.

6. VerificationoftruthtableoftheMultiplexer74150.

7. VerificationoftruthtableoftheDe-Multiplexer74154.

8. DesignandtestofSRFlipFlop(F/F)usingNAND/NORgates.

9. VerifythetruthtableofaJ-KF/F(7476).

10. VerifythetruthtableofaDF/F(7474).

11. Operatethecounters7490,7493,and74194.Verifythefrequencydivisionateachstageandwithalowfrequencyclock(say1Hz)displaythecountonLED's.

12. Verifythetruthtableofdecoderdriver7447/7448.Henceoperatea7segmentLEDdisplaythroughacounterusingalowfrequencyclock.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursecontents.

Course No: CSE-4417L

Data Communication Lab

1. Generationanddetectionofamplitudemodulatedsignals.

2. Generationanddetectionoffrequencymodulatedsignals.

3. Tomeasuresensitivity,selectivity,andfidelityofaradioreceiver.

4. TogeneratePAMandPDMsignalsusingIC555.

5. Tomeasurethenoisefigureofthefollowingsystems:-

6. A.M.FMSystem.

7. MakingStraight,RolloverandCross-Overcables

8. StudyofAmplitude,FrequencyModulation

9. StudyoffrequencyModulation

10. StudyofASK,FSKModulation

11. Simplepoint-to-pointcommunicationanderrordetection

Note: Thisisonlythesuggestedlistofpracticals.Instructormayframeadditionalpracticalsrelevanttothecour secontents

Course No: CSE-5117

Operating Systems

Objective:Theobjectiveofthiscourseistomakeastudentunderstandtheservices,processmanagement,inter-processcommunicationandmemorymanagementtechniqueshandledbyoperatingsystem.Moreover,tolearnbasicsaboutfile-systemdesignandimplementationissues.

Unit 1

Introductiontooperatingsystems: Operatingsystemandfunctions,evolutionofoperatingsystem,batch,interactive,timesharingandrealtimesystem,systemprotection.

Operatingsystemstructure: Systemcomponents,operatingsystemservices.

Processmanagement: Processconcept,principleofconcurrency,producerconsumerproblem,criticalsectionproblem,semaphores,interprocesscommunication.

Unit 2

Processscheduling: Schedulingconcept,schedulingcriteria,schedulingalgorithms,multiprocessorscheduling.

Deadlock: Systemmodel,deadlockcharacterization,deadlock-prevention,avoidance,detectionandrecovery.

Memorymanagement: Multi-programmingwithfixedpartition,multiprogrammingwithvariablepartition,paging,segmentation.

Unit 3

Virtualmemorymanagement: Virtualmemoryconcept,Demandpaging,Performance,Pagereplacedalgorithm,Allocationofframes,Thrashing.

Filesystem: FileConcept,AccessMethods,DirectoryandDiskStructure,FileSharing.

I/Omanagementanddiskscheduling:I/Odevices,I/Oscheduling,I/Obuffering,DiskI/O,Diskschedulingalgorithms,RAIDStructure.

BooksRecommended:

1. J.Peterson,A.Silberschatz,andP.Galvin.OperatingSystemConcepts,AddisonWesley,3rdEdition ,1989.

2. M.J.Bach.DesignoftheUnixOperatingSystem,PrenticeHallofIndia,1986.

3. Silberschatz,Galvin,Gagne,"OperatingSystemConcepts",JohnWileyandSons,9thedition,2013

4. ModernoperatingsystemsbyA.S.Tanenbaun,2ndedition.PHI

5. OperatingsystembyMilanMilenkovie:TataMcGrawHill.

CourseNo:CSE-5217

ComputerArchitectureandOrganization

Objective:Theobjectiveofthiscourseistomakeastudentunderstandthebasicstructureandoperationofdigi talcomputer,designofarithmeticandlogicunit,implementationoffixed-pointandfloating- pointarithmeticoperations,controlunittechniques,conceptofpipelining,hierarchicalmemoryandtechniqu esofcommunicatingwithI/Odevices.

Unit 1

BasicStructureandFunctionalInterconnections: Basicstructureandfunctionsofadigitalcomputer,Von Neumanarchitecture,hierarchicalstructureoffunctionalunitsandtheirinterconnection;Busarchitecture

InstructionExecutionandAddressingModes: Instructionset,processorregistersviz.PC,IR,MAR,MBR, PSW,etc,instructioncycle,instructionformatandtypes,executionofacompete(basic)instruction,micro- operations,addressingmodes,CPUorganizations-accumulator,generalregisterandstack.

Unit 2

DataRepresentation: Integerrepresentation-sign- magnitudeandtwo'scomplement,Integeraddition,subtraction,multiplicationanddivision,Booth'salgorith m,floatingpointrepresentation,IEEE754standard.

ControlUnitOrganization: Hardwiredcontrol,micro-programmedcontrol,micro- instructions,addresssequencing,controlmemory,introductiontopipelining.

Unit 3

MemoryHierarchyandCacheMemoryOrganization: Semiconductormainmemory,RAManditstypes- SRAMandDRAM,memoryhierarchy,localityofreference,cachememory,organizationandcharacteristics ,mappingtechniques- direct,associativeandsetassociative,replacementalgorithms(briefaccountonly),writepolicies-write- backandwrite-through.

I/OTechniquesandInterfaces:I∕Omodulesandtheirfunctions,programmedI∕O,commands,memory-

mappedandisolatedI∕O,interrupt-

drivenI∕O,DMA,introductiontostandardinterfacesviz.PCI,SCSI,andUSB.

Booksrecommended:

1. ComputerSystemArchitecture,M.MorisMano,PearsonEducation.
2. ComputerOrganisationandArchitecture,WilliamStallings,PearsonEducation.
3. ComputerSystemArchitecture,J.P.Hayes,PearsonEducation.
4. ComputerOrganization,Hamachar,VranesicandZaky.

CourseNo:CSE-5317

DatabaseManagementSystems

Objective:TheobjectiveofthiscourseistomakeastudentunderstandthebasicconceptsofDBMS,learnmodels,conceptualizeanddepictadatabasesystemusingERdiagrams,databaselanguages,normalizationanditsimportanceandtoknowthefundamentalconceptsoftransactionprocessingtechniques.

Unit 1

IntroductionandArchitecture: Overviewofdatabasemanagementsystem,databasesystemversesfilesystem,databasecharacteristics,databasesystemconceptandarchitecture,dataindependence,schemasandinstances,usersanddatabaseadministrators.

DataModelingusingtheEntityRelationship(ER)Model: Mappingconstraints,keys,generalization,aggregation,reductionofanERdiagramstotables,extendedERmodel,relationshipofhigherdegree.

RelationalDataModelandLanguage: Relationaldatamodelconcepts,integrityconstraints,entityintegrity,referentialintegrity,Keyconstraints,Domainconstraints,relationalalgebraandrelationalcalculus-operationsandqueries.

Unit 2

DatabaseLanguagesandStructuredQueryLanguage(SQL):DML,DDLandDCL,SQL-arelationaldatabaselanguage,datedefinitioninSQL,constraints,views,indexes,queriesandsub-queriesinSQL,triggers,cursorsandstoredprocedures.

FunctionalDependency(FD)andNormalization: Needfornormalization,functionaldependency,normalformsbasedonprimarykeys(1NF,2NF,3NFandBCNF),losslessjoinanddependencypreservingdecomposition,multivaluedFDandfourthnormalform,Joindependencyandfifthnormalform.

Unit 3

TransactionManagement: Transactionconceptandstate,implementationofatomicity,isolationanddurability,concurrentexecutions,serializabilityofschedules.

ConcurrencyandRecoveryControl: Techniques,lock-basedprotocols,timestampbasedProtocols,deadlockanddeadlockhandling.

Recovery: Recovery system, failure classification, storage structure, recovery and atomicity, log-based recovery, shadow paging, recovery with concurrent transactions.

Books Recommended:

1. R.El.Masri and S.B.Navathe. Fundamentals of DataBase Systems, Benjamin Cummings.

2. H.F.Korth and A.Silberschatz. Database Concepts, 2nd Edition, Mcgraw Hill, 1991.

3. J.D.Ullman. Principles of Database and Knowledge Base Systems, Vol. I and II.

CourseNo:CSE-5417

InternetandWebTechnology

Objective:Theobjectiveofthiscourseistomakeastudentunderstandthebasicconceptofinternet,basicsof WebDesigningusingHTML,DHTMLandCSSandlearnthebasicsaboutclientsidescriptsandserversidescr ipts.

Unit 1

IntroductiontoInternet: Historyofinternet,internetarchitecture,internet'sclient/serverarchitecture,inter netserviceproviders,applicationsandservices,Internetprotocols,uniformresourcelocator,webpages.

HTML: Introduction,list,tables,images,forms,frames,cascadingstylesheets.HTML5controls.

Unit 2

XML: Document type definition, XML Schemas. Document Object model.

JavaScript: Introduction,controlstatements,Validation.

Servers:WAMP, LAMP, MAMP, XAMP,MySQL.

Unit 3

PHP: Installationandintroduction,LoopsStringFunctionsinPHP,PHPEmailFunction,VariablesArraysinP HPwithAttributes,DateandTime,ImageUploading,FilehandlinginPHPFunctionsinPHP,Errorshandlingi nPHP,Sessionhandling.PHPdatabaseconnectivitytoMySQL.

BooksRecommended:

1. PaulJ.Deitel,HarveyM.Deitel,AbbeyDeitel,"InternetandWorldWideWebHowtoProgram",Deitelseri es,5[th]edition,2012.
2. JasonGilmore,"BeginningPHPandMySQLFromNovicetoProfessional",4[th]Edition,ApressPublicati ons,2010.
3. RobertW.Sebesta,"ProgrammingwithWorldWideWeb",Pearson,4[th]edition,2008.
4. DavidWilliamBarron,"TheWorldofScriptingLanguages",WileyPublications,2000.
5. ThecompletereferenceHTMLandCSSbyThomasAPowell.

6. ProfessionalJavaScriptforWebDevelopersbyNicholasCZakas.

7. TheJavaCompleteReferencebyHerbertSchildt.

CourseNo:ECE-5517

Digital Signal Processing

Objective:Theobjectiveofthiscourseistointroducethebasicconceptsofsignalsandtechniquesforprocessingthesignals.Studentswillbefamiliarwiththemostimportantmethods/techniquesinDSP,includingtransform-domainprocessinganddigitalfilterdesign.

Unit 1

SignalsandSystems:introduction,basicoperationsonsignals,continuoustimeanddiscretetimesignals,step,impulse,ramp,exponentialandsinusoidalfunctions,continuoustimeanddiscretetimesystems.

PropertiesofSystems: Linearity,causality,timeinvariance,memory,stability,invertibility.

Lineartimeinvariantsystems:convolution,Z-transform,regionofconvergence,propertiesofZ-transform,inverseZ-transform.

Unit 2

FourierTransform: Fouriertransform(FT)ofdiscretetimesignals,propertiesofFT,relationbetweenZ-transformandFT.

DiscreteFouriertransform(DFT): PropertiesofDFT,inverseDFT,FastFouriertransform(FFT),Radix-2FFTalgorithms,butterflystructure.

Unit 3

DigitalFilterStructures: Blockdiagramandsignalflowgraphrepresentation.

StructuresforIIR:directformstructure,cascadeformstructure,parallelformstructure,latticestructure.

StructuresforFIR: Directformstructures,directformstructureoflinearphasesystem,cascadeformstructure,frequencysamplingstructure,latticestructure.

BooksRecommended:

1. DigitalSignalProcessing:Principles,AlgorithmandApplication",Proakis,Manolakis,Pearson.
2. DiscreteTimeSignalProcessing":Oppeheim,Schafer,BuckPearsoneducationpublication.

3. DigitalSignalProcessingfundamentalsandApplications,LiTan,JeanJiang,Academic.

4. DigitalSignalProcessing‑AcomputerbasedApproach,S.K.Mitra,TataMcGrawHill.

5. FundamentalsofdigitalSignalProcessing−Lonniec.Ludeman,Wiley.

Course No: CSE-5317L

Database Management Systems Lab

Thestudentwillbeexposedtodatabaseaccesstechniquesusinganinteractiveapproach.Thisapproachwill useIndustryStandardStructuredQueryLanguage(SQL)tomaintaintablestoanswerqueriesandmaintain datausingsingletablesandmultipletablejoins.

ThestudentwouldhavetodevelopandwriteSQLqueriesthatwill

1. Extractdatafromasingletable

2. Usepredicatesandoperators

3. UseSQLfunctions

4. Add,changeandremovedatainadatabase

5. Managedatabasetransactions

6. Createandmanagetablesandotherdatabaseobjects

7. Controlaccesstodata

8. Jointogetherdataitemsfrommultipletables

9. Usesub-queriesforselectionofdata

10. Performsummeryanalysis

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec ontents.

Course No: CSE-5417L

Internet and Web Technology Lab

1. BuildingHTMLdocuments.

2. Insertingtexts,images,hyperlinksetc.inHTMLdocuments.

3. Useoflists,tablesandformsinwebpages.

4. WritevariousprogramsforclientsidevalidationtounderstandtheJavascriptconcepts.

5. DevelopaminiprojectinPHPusingPHPcomponentsandMySQL.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec ontents.

Course No: ECE-5517L

Digital signal processingLab

AlltheseexperimentsmustbeimplementedusingMATLAB

1. Verificationofsamplingtheorem
2. Studylinearconvolutionoftwogivensequences
3. Studycircularconvolutionoftwogivensequences
4. StudyAutocorrelationofgivensequence.
5. ComputationofNpointDFTofagivensequence
6. Generationofsignals

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec ontents.

CourseNo:CSE-6117

TheoryofComputation

Objective:Theobjectiveofthiscourseistomakeastudentunderstandtheconceptsinautomatatheoryandtheoryofcomputation,identifydifferentformallanguageclassesandtheirrelationships,designgrammarsandrecognizersfordifferentformallanguages.

Unit 1

IntroductiontoTheoryofComputationandFiniteAutomata:

Motivationforstudyingtheoryofcomputation,understandingcomplexity,computability,abstractmachineandcomputations.Notionofformallanguages-mathematicalnotions,terminology,proofbyinduction.Languagemembershipproblemasthecentralproblemofthesubject.Deterministicfiniteautomata(DFA),Non-deterministicfiniteautomata(NFA),andregularexpressions-theirequivalence∕conversions.Regulargrammarandequivalencewithfiniteautomata.Pumpinglemmaforregularlanguages,Closurepropertiesofregularlanguages,MinimizationofDFA.

Unit 2

PushdownAutomata(PDA)andContextFreeLanguages(CFL):

ContextfreeGrammar(CFG)andCFL.Derivationandparsetrees,AmbiguityinCFL,NormalformsofCFL:ChomskyNormalform(CNF)andGreibeghNormalForm(GNF),ClosurepropertiesofCFL.PumpingLemmaforCFL.DeterministicandNon-DeterministicPDA.NotionofAcceptancebyPDA,EquivalenceofPDAandCFG.CYKalgorithmforCFLmembership,testingemptinessofCFL's.IntroductiontoContextsensitivegrammarandContextsensitivelanguage.

Unit 3

TuringMachines(TM)andUn-decidability:

Historicalcontext,DefinitionofTM,instantaneousdescriptionasasnapshotofTMcomputation,DeterministicandNon-DeterministicTMandtheirequivalence,OthervariantsofTuringmachine(multi-track,multi-tape,semi-infinitetape,countermachines),Un-restrictedgrammaranditsequivalencewithTM,Turing-

recognizable(recursivelyenumerable)andTuring-

decidable(recursive)languages.ChurchTuringthesis,Reducibilityanditsuseinprovingun-

decidability,TheDiagonalizationlanguage,UniversalTuringmachine,Ricestheorem,Un-

decidabilityofPostcorrespondenceproblem,Turing’sHaltingProblem.ChomskyHierarchyofformallangu

ages.

BooksRecommended:

1. P.Linz,“IntroductiontoFormalLanguagesandAutomata”,3PWSPublishingCompany.

2. J.E.HopcroftandJ.D.Ullman.IntroductiontoAutomataTheory.

3. C.PapadimitrouandC.L.Lewis.ElementsofTheoryofComputation,Prentice-Hall.

4. TheoryofcomputationbyK.L.P.Mishra,PHI.

5. MichaelSipser,“TheoryofComputation”,CengageLearning.

Course No: CSE-6217

Unix and Shell Programming

*Objective:*This course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make student learn fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it.

Unit 1

File and common commands-Shell-More about files-Directories-Unix system-Basics of file Directories and filenames-Permissions-modes-Directory hierarchy-Devices-the grep family-Other filters-the stream editor sed-the awk pattern scanning and processing language-files and good filters. Command line structure-Metacharacters-Creating new commands-Command arguments and parameters-program output as arguments.

Unit 2

Shell variables-More on I / O redirection-loop in shell programs-Bundle-Settings shell attributes, Shift command line parameters-Exiting a command or the shell, evaluating arguments-Executing command without invoking a new process-Trapping exit codes-Conditional expressions. Customizing the cal command, Functions of command, While and Until loops-Traps-Catching interrupts-Replacing a file-Overwrite-Zap-Pick command-News command-Get and Put tracking file changes. Standard input and output-Program arguments-file access-A screen at a time printer-On bugs and debugging-Examples-Zap-pick-Interactive file comparison program-Accessing the environment.

Unit 3

Unix system calls Low level I / O, File system Directories and modes, Processors, Signal and Interrupts. Program development-Four function calculator-Variables and error recovery Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures-Performance evaluation-Ms macro package Troff level-Tbl and eqn preprocessors-Manual page-Other document preparation.

BooksRecommended:

1. UNIXShellProgrammingBookbyPatrickH.WoodandStephenG.Kocha.

2. UnixandShellProgrammingTextbookbyBehrouzA.Forouzan,Mostafavi,RichardF.GilbergFirouzMosharraf.

3. Unix,ConceptsandApplicationsbySumitabhaDas.

CourseNo:CSE-6317

Microprocessor

Objective:Theobjectiveofthecourseistoexposestudentstothearchitectureandinstructionsetoftypical8-bitmicroprocessor(8085A).ItalsodealswithAssemblyLanguageprogramming.Input-outputtechniquesandimportantprogrammablesupportchipsusedinmicroprocessor-basedsystemsarealsodiscussed.Moreover,giveabasicconceptof8086microprocessor.

Unit 1

IntroductiontoaMicrocomputerSystem.

Architectureof8-bitMicroprocessor,Intel8085Amicroprocessor,Pindescriptionandinternalarchitecture.

OperationandControlofMicroprocessor: Timingandcontrolunit,op-codefetchmachinecycle,memoryread/writemachinecycles,I/Oread/writemachinecycles.

SemiconductorMemories: Developmentofsemiconductormemory,internalstructureandaddressdecoding.

Unit 2

InstructionSet: Instructionclassification-datatransfer,arithmetic,logical,branch,stackandmachinecontrolgroupsofinstructions.

AddressingModes: Introduction,typesofaddressingmodes.

Interrupts:Interruptstructureof8085Amicroprocessor,vectoredandnon-vectoredinterrupts,hardwareandsoftwareinterrupts.

Unit 3

Interfacing:Interfacingofmemorychips,interfacingofI/Odevices.MemorymappedandIsolatedI/O.

Input/Outputtechniques:CPUinitiateddunconditionalandconditionalI/Otransfer,DeviceinitiatedinterruptI/Otransfer.

Input/OutputPorts:Non-Programmable(Intel8212),Programmable(Intel8255-ProgrammablePeripheralInterface).

8086Microprocessor:Introductionto8086,PindescriptionandAddressing Modes.

BooksRecommended:

1. GaonkarR.S.,"MicroprocessorArchitecture,ProgrammingandApplications",5thEd.,PenramInternational,2007.

2. HallD.V.,"MicroprocessorandInterfacing-ProgrammingandHardware",2ndEd.,TataMcGraw-HillPublishingCompanyLimited,2008.

3. StewartJ,"MicroprocessorSystems-Hardware,SoftwareandProgramming",PrenticeHallInternationalEdition,1990.

4. ShortK.L.,"MicroprocessorsandProgrammedLogic",2ndEd.,PearsonEducation,2008.

5. Mathur,Sunil.,"Microprocessor8086-Architecture,ProgrammingandInterfacing",PHILearningPvt.Ltd.

CourseNo:CSE-6417

SoftwareEngineering

Objective: The objective of this course is to make a student understand the Software Engineering practices, process Models, design engineering, software testing, cost estimation, software project management and to gain knowledge of the overall project activities.

Unit 1

SoftwareDevelopmentModelsandRequirementsEngineering:

Softwarecrisis,whatissoftwareEngineering,evolvingroleofsoftware,legacysoftware,productandprocess,characteristicsofproduct,agenericviewofprocess,aprocessframework,CapabilityMaturityModelIntegration(CMMI),processmodels-incremental,evolutionaryandprototypingmodels.TheConcurrentDevelopmentModel.Requirementsengineeringtasks,SRS,informalandformalspecifications,usecases,Analysismodelingapproaches,datamodelingconcepts,objectorientedanalysis,scenariobasedmodeling,usecases,floworientedmodeling,classbasedmodeling,behaviormodel.

Unit 2

DesignMethodologiesandTesting:

Architecturaldesign,distributedsystemsdesign,applicationarchitectures,objectorienteddesign,realtimesoftwaredesign,userinterfacedesign,verificationandvalidation,softwaretesting,structuralandfunctionaltesting,regressiontesting,debugging.

Unit 3

SoftwareCostEstimationandReliability:

Softwarecostestimation,costmetrics,qualitymanagement,processimprovement,configurationmanagement,softwarereuse,re-engineering,securityengineering,serviceorientedsoftwareengineering,aspectorientedsoftwareengineering.

Booksrecommended:

1. SoftwareEngineering‑Apractitioner'sapproachbyRogerSPressman.
2. SoftwareEngineeringbyIanSommerville.
3. SoftwareEngineeringbyPankajJhalote.

Course No: CSE-6517

Computer Networks

Objective: The objective of this course to gain insight about networks, topologies, and the key networking concepts. To understand the layered communication architectures (OSI and TCP/IP). To understand the basic communication protocols, design issues, and significance of each in different layers of ISO and TCP/IP.

Unit 1

Basic Concepts of Networks: Advantages and applications, Types of networks (LAN, MAN and WAN), Different network topologies like star, ring, hybrid, tree.

Network Protocol Architecture: OSI Reference model, Layers of OSI model: Physical, Data-link, Network, Transport, Session, Presentation and Application layer, Concept of TCP/IP Protocol Suite.

Network Switching Techniques: Circuit switched, message switching and packet switched networks, Datagram and virtual circuit services, Frame relay, ATM.

Unit 2

Flow and Error Control: Stop and wait flow control, Sliding window flow control, error control protocols, ARQ techniques, Stop-and-wait ARQ, Go back by N ARQ, Selective repeat ARQ. HDLC Protocol, Point to Point Protocol.

Medium Access Control Protocols: TDMA, FDMA, CDMA, ALOHA, Slotted ALOHA, CSMA, CSMA/CD, CSMA/CA, Ethernet, Token Ring network.

Network layer: Logical Addressing-IPv4 and IPv6 addresses, Concept of Sub-netting and Classless Addressing, Network Address Translation.

Unit 3

Routing Algorithms: Routing tables, features of a routing algorithm, classification, optimality principle, sink tree, shortest path algorithm, Dijkstra algorithm, flooding, fixed routing, random routing, adaptive routing, distance vector and link state algorithm.

Transport Layer: Process to Process Delivery, Socket Addresses, User Datagram Protocol (UDP), Transmission Control Protocol (TCP).

Congestion Control: Congestion in networks and quality of service.

Application Layer: File Transfer, Electronic mail, Remote Logging.

BooksRecommended:

1. PetersonandDavie,"ComputerNetworks"5thEd,MorganKaufman

2. WilliamStallings:DataandComputerCommunications,7thEd,PHI

3. D.PBertsekas"DataNetworks"PrenticeHall

4. AndrewTanenbaum,"ComputerNetworks",4thEditionbyPearson.

5. J.F.Kurose"ComputerNetworking"Addison-Wesley

6. DouglasE.Comer,"InternetworkingwithTCP/IP,Volume1",PHI.

7. DouglasE.Comer,"Client-ServerProgrammingwithTCP/IP,Volume3",PHI.

1. Executionofvariousfile/directory-handlingcommands.

2. Simpleshellscriptforbasicarithmeticandlogicalcalculations.

3. Shellscriptstocheckvariousattributesoffilesanddirectories.

4. Shellscriptstoperformvariousoperationsongivenstrings.

5. ShellscriptstoexploresystemvariablessuchasPATH,HOMEetc.

6. Shellscriptstocheckandlistattributesofprocesses.

7. Executionofvarioussystemadministrativecommands.

8. Writeawkscriptthatusesallofitsfeatures.

9. Useseedinstructiontoprocess/etc/passwordfile.

10. Writeashellscripttodisplaylistofuserscurrentlyloggedin.

11. Writeashellscripttodeleteallthetemporaryfiles.

12. Writeashellscripttosearchanelementfromanarrayusingbinarysearching.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec

ontents.

1. Todevelopaprogramtoaddtwodoublebytenumbers.

2. Todevelopaprogramtoaddtwofloatingpointnumbers.

3. Todevelopaprogramtomultiplytwosinglebytenumbersgivinga16bitproduct.

4. Todevelopaprogramtomultiplytwopositivefloatingpointnumbers.

5. Towriteaprogramtodividea4bitnumberbyanother4bitnumber.

6. Towriteaprogramtodividea8bitnumberbyanother8bitnumber.

7. Writeaprogramforadding1stNnaturalnumbersandstoringtheresultinmemorylocation.

8. Writeaprogramthatincrementsanumberstoredinaregister.

9. Writeaprogramtointroduceatimedelayof100ms.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursecontents.

Course No: CSE-6517L

Computer Networks Lab

1. IntroductionandNetworkWireCrimping.
2. IntroductionofNetworkSimulators.
3. ExperimentalstudyofcommonprotocolssuchasHTTP,FTP,SMTP,usingnetworkpacketsniffers.
4. ExperimentswithpacketsnifferstostudytheTCPprotocol.
5. IntroductiontoNS2(networksimulator)-

   smallsimulationexercisestostudyTCPbehaviourunderdifferentscenarios.
6. SettingupasmallIPnetwork-

   configureinterfaces,IPaddressesandroutingprotocolstosetupasmallIPnetwork.
7. ExperimentswithNS2tostudybehaviour(especiallyperformanceof)ofvariousprotocols.
8. SmallexercisesinsocketprogramminginC/C++/Java.

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec
ontents.

CourseNo:CSE-7117

CryptographyandNetworkSecurity

Objective:Theobjectiveofthiscoursetounderstandthebasicnetworksecurityissues,typesofattacksandm echanismstocombatsuchattacks.Tounderstandauthenticationchallenges,requirementsandauthenticat ionalgorithms.Tocomprehendpublicandprivatekeymanagementissues.Tounderstandnetworklayersec urityprotocols,transportlayersecurityprotocolsandwebsecurityprotocols.

Unit 1

BasicConcepts: Introductiontosecurityattacks,servicesandmechanism,classicalencryptiontechniques substitutionciphersandtranspositionciphers,cryptanalysis,steganography,Streamandblockciphers.

ModernBlockCiphers: Blockciphersprinciples,Shannon'stheoryofconfusionanddiffusion,fiestalstructu re,dataencryptionstandard(DES),blockciphermodesofoperations,TripleDES.

NumberTheoryandFiniteFields: Introductiontogroup,field,finitefieldoftheformGF(p),modulararithmeti c,primeandrelativeprimenumbers,extendedEuclideanalgorithm,Fermat'sandEuler'stheorem,discretel ogarithmicproblem.

Unit 2

AdvancedEncryptionStandard(AES):AESencryption,decryptionandkeyexpansion.

PublicKeyCryptography: Principlesofpublickeycryptosystems,RSAalgorithm.

CryptographicHashFunctions: Applicationofcryptographichashfunctions,requirements,SecureHashA lgorithm(SHA).

MessageAuthenticationCodes: Authenticationrequirements,authenticationfunctions,messageauthen ticationcode,HMACAlgorithm.

Unit 3

DigitalSignatures: DigitalSignaturePropertiesandRequirements,ElgamalDigitalSignatureTechnique, Digitalsignaturestandard(DSS).

KeyManagementandDistribution: Symmetrickeydistribution,Diffie-HellmanKeyExchange,Publickeydistribution,X.509Certificates,PublickeyInfrastructure.

IPSecurity: Architecture,Authenticationheader,Encapsulatingsecuritypayloads,combiningsecurityass ociations,keymanagement.

TransportLevelSecurity: IntroductiontoSecureSocketLayerandTLS,HTTPS.

SystemSecurity: Introductoryideaoflntrusion,Intrusiondetection,Virusesandrelatedthreats,Firewalls.

BooksRecommended:

1. CryptographyandNetworkSecurity-WilliamStallings,PearsonEducation.

2. CryptographyandNetworkSecurity-BehrouzA.Forouzan,TataMcGraw-Hill.

3. NetworkSecurity-CharlieKaufman,RadiaPerlman,MikeSpeciner.

4. AppliedCryptography,Protocols,Algorithms,andSouceCodeinC.Schneier,Wiley

Course No: CSE-7217

Compiler Design

Objective:Theobjectiveofthiscourseistointroducethemajorconceptareasoflanguagetranslationandcompilerdesign,enrichtheknowledgeinvariousphasesofcompileranditsuseandtoprovideprogrammingskills necessaryforconstructingacompiler.

Unit 1

IntroductiontoCompiler,CompilerStructure: Variousphasesofcompiler,analysis-synthesismodelofcompilation,toolbasedapproachtocompilerconstruction.

FiniteAutomataandLexicalAnalysis: Lexicalstructureofalanguage,roleoflexicalanalyzer,tokens,patternsandlexemes:specificationandrecognition.Designoflexicalanalyzers,finitestatemachines,regularexpressionsandtheirapplicationstolexicalanalysis,optimizationofDFA-basedpatternmatchers,LEX-compiler.

TheSyntacticSpecificationofProgrammingLanguages: Contextfreegrammars(CFG),capabilitiesofCFG.

Unit 2

TopDownParsing: Topdownparsingmethods,grammarsimplification,eliminationofleftrecursion,leftfactoring,grammarambiguity.Recursivedescentparsingandpredictiveparsers,LL(1)grammarandLL(1)parsingtableandalgorithm.

BottomUpParsing: Shift-reduceparsing,precedenceparsing,LRparsers,thecanonicalcollectionofLR(O)items,constructingSLRparsingtables,constructingcanonicalLRparsingtables,constructingLALRparsingtables,anautomaticparsergenerator(YACC).

Unit 3

Syntax-DirectedTranslation: Translationschemes,inheritedandsynthesizedattributes,dependencygraph,evaluationorder,intermediatecode,postfixnotation,parsetrees,syntaxtrees,threeaddresscode,quadruplesandtriples.Translationofvariouslanguagestatements.

TypeChecking: Typesystems,typeexpressions,typeconversionandoverloading.

SymbolTables: Datastructureforsymbolstables,representingscopeinformation.

CodeOptimizationandCodeGeneration: Designissues,addressesinthetargetcode,basicblocksandflowgraphs,optimizationofbasicblocks,codegenerator.Machine-independentoptimizations,loopoptimization,DAGrepresentationofbasicblocks,valuenumbersandalgebraiclaws,globaldata-flowanalysis.

BooksRecommended:

1. Aho,SethiandUllman,"Compilers:Principles,TechniquesandTools",PearsonEducation

2. VRaghvan,"PrinciplesofCompilerDesign",TMH

3. KennethLouden,"CompilerConstruction",CengageLearning.

4. CharlesFischerandRicardLeBlanc,"CraftingaCompilerwithC",PearsonEducation

5. K.Muneeswaran,CompilerDesign,FirstEdition,OxfordUniversityPress.

6. J.P.Bennet,"IntroductiontoCompilerTechniques",SecondEdition,TataMcGraw-Hill.

Course No: CSE-7317

Computer Graphics

Objective:Theobjectiveofthecourseistointroducestudentstotheareaofcomputergraphic,graphicdesign, vectorandrastergraphic,graphictransformationsandvariousgraphicalgorithms.

Unit 1

Introduction:overviewofcomputergraphics,computergraphicsapplicationandsoftware.

GraphicsDisplaydevices: Cathoderaytubebasics,raster,refresh,randomdisplaydevices.

ColourDisplay:shadowmasking,beampenetrationanduseoflookuptables.

Unit 2

ScanconversionLines,CirclesandEllipses: Linedrawingalgorithm(Bresenham'sandDDA),circledrawi ngalgorithm,ellipsedrawingalgorithm.

Two-DimensionalTransformations: Homogeneouscoordinatesandmatrixrepresentationof2Dtransformatio ns,translationsandhomogeneouscoordinates,rotation,reflection,scaling.

Three-DimensionalTransformations: Three-dimensionalscaling,three-dimensionalshearing,three-dimensionalrotation,three-dimensionalreflection,three-dimensionaltranslation.

Unit 3

Lineclippingalgorithms: Cohen-Sutherland,midpointsubdivisionandCyrus-Beck.

PolygonClippingAlgorithm: Sutherland-Hodgemanpolygonclipping.

HiddenSurfacesandLines: Introduction,backfaceremovalalgorithm,thez-bufferalgorithm,Painter'salgorithms(depthsorting).

PlaneCurvesandSurfaces: Curverepresentation,nonparametriccurves,parametriccurves,cubicspline s,BezierCurves,B-splinecurves,Beziersurfaces.

BooksRecommended:

1. ComputerGraphicsandApplications,HearnandBaker,PearsonEducation.

2. J.D.Foley,A.VanDam,S.K.FeinerandJ.F.Hughes,ComputerGraphics-PrinciplesandPractice,SecondEditioninC,PearsonEducation,2003.

3. D.HearnandM.PaulineBaker,ComputerGraphics(CVersion),PearsonEducation,2ndEdition,2004.

4. D.F.RogersandJ.A.Adams,MathematicalElementsforComputerGraphics,2ndEdition,McGraw-HillInternationalEdition,1990.

5. F.S.HillJr.,ComputerGraphicsusingOpenGL,PearsonEducation,2003.

6. NewmanandSproul,PrinciplesofInteractiveComputerGraphics,TMH

7. FoleyandVanDam.FundamentalsofInteractiveComputerGraphics,Addison-Wesley.

Course No: CSE-7317L

Computer Graphics Lab

1. ImplementationoflinegenerationusingDDAandBresenham'salgorithms.

2. ImplementationofcirclegenerationusingMid-pointalgorithm.

3. TwoDimensionaltransformations-Translation,Rotation,Scaling,Reflection.

4. CohenSutherland2DlineclippingandWindowing

5. Sutherland-HodgemanPolygonclippingAlgorithm.

6. Threedimensionaltransformations-Translation,Rotation,Scaling

Note: Thisisonlythesuggestedofpractical.Instructormayframeadditionalpracticalsrelevanttothecoursec
ontents.

Course No: CSE-8117

Entrepreneurship Development and Management

Objective: *The objectives of this course are to explain the key ingredients to be a successful entrepreneur, appreciate the value of entrepreneurship in daily life especially in marketing and understand the impact of social and environmental issues in starting up of a new venture. To develop entrepreneurial culture and provide opportunity to build analytical and practical skills.*

Unit 1

Organizational Behavior and HRM: Evolution of organizational behavior (industrial revolution, scientific management), personality - personality traits - MBTI - Big-five model, leadership - theories of leadership - trait theory - path-goal theory.

Recruitment and Selection: Motivation - Herzberg - Maslow's theories. Organization structure - line - line and staff - functional structures, training and development

Unit 2

Marketing Management: Concepts of marketing, marketing mix - product - price - place - promotion, product lifecycle, new product development, pricing - objectives and strategies. Segmentation, targeting, positioning.

Production and Finance Management: Plant location - factors affecting plant location, plant layout - process - product layout inventory control, EOQ. Wealth maximization and profit maximization, financial decisions - investment - financing - dividend decisions.

Unit 3

Nature and Development of Entrepreneurship: Definition of Entrepreneur today. The Entrepreneurial decision process. Types of Start-ups. Role of Entrepreneurship in economic development.

Quantative Tools for Entrepreneurs: Formulation and graphical solution of linear programming problems, construction of network projects, PERT and CPM, calculation of earliest start, earliest finish, latest start and latest finish of activities crashing of activities (Basic concepts only).

BooksRecommended:

1. OrganizationandmanagementbyAggarwal.

2. MarketingmanagementbyPhilipKotler,

3. QuantativetechniquesbyN.D.Vohra

4. Entrepreneurship-HisrichPetersMcGraw-Hill

5. OrganizationalbehaviorbyS.PRobbins

CourseNo:CSE-8217

ArtificialIntelligence

*Objective:*Theobjectiveofthiscourseistomakeastudentunderstandtheconceptsofartificialintelligence,methodsofsolvingproblemsusingartificialintelligence,knowledgerepresentationandintroducetheconceptsoflearningmethodsandclassificationtechniques.

Unit 1

Introduction: Introductiontoartificialintelligence,historyofartificialintelligence,applicationsofartificialintelligence,intelligentagents,structureofintelligentagents.

Search: Uninformedsearchstrategies:breadthfirstsearch(BFS),depthfirstsearch(DFS),depthlimitedsearch(DLS),uniformcostsearch,iterativedeepeningsearch,hillclimbing,beamsearch.HeuristicSearch:Heuristicfunctions,A*algorithm.

GamePlaying: Adversialsearch,games,minimaxalgorithm,optimaldecisionsinmultiplayergames,alpha-betapruning,evaluationfunctions,andcuttingofsea.

Unit 2

KnowledgeRepresentationandReasoning: Propositionallogic,first-orderlogic,inferenceinfirstorderlogic-forwardandbackwardchaining,theoremproving,resolutiontheoremproving,rulesandrule-basedreasoning,structuredknowledgerepresentation,probabilisticreasoning,reasoningwithuncertainknowledge(Bayesianinferencenetworks),HiddenMarkovModel.

Unit 3

Learning: Introductiontolearning,Supervisedandunsupervisedlearning.

ClassificationTechniques: Nearestneighbor(NN)rule,supportvectormachine(SVM),K-meansclustering,decisionTrees.

StatisticalLearningModels: BayesClassifier,NaiveBayesmodels,GaussianMixtureModel(GMM),Expectation-maximization(EM)algorithm.

BooksRecommended:

1. StuartRussell,PeterNorvig,"ArtificialIntelligence-AModernApproach",PearsonEducation

2. CharniakandMcdermott.IntroductiontoArtificialIntelligence,Addison-Wesley,1985.

3. Ginsburg.EssentialsofArtificialIntelligence,MorganKaufmann,1993.Winston.ArtificialIntelligence, 3rdEdition.

4. ElaineRichandKevinKnight,"ArtificialIntelligence",McGraw-Hill

5. ECharniakandDMcDermott,"IntroductiontoArtificialIntelligence",PearsonEducation

6. DanW.Patterson,"ArtificialIntelligenceandExpertSystems",PrenticeHallofIndia

CourseNo:CSE-761117

DistributedComputing

Objective: *Toprovidestudentswithcontemporaryknowledgeinparallelanddistributedcomputing,designis suesinaparallelanddistributedcomputingsystem.*

Unit 1

Anoverviewofparallelcomputing,Languagesandprogrammingenvironments,Messagepassingcomputing,Partitioninganddivide-and-conquerstrategies,Pipelinedcomputations,Synchronouscomputations,Loadbalancingandterminationdetection,Programmingwithsharedmemory.

Unit 2

AlgorithmsandapplicationsComponentsofdistributedsystems,communicationtechnologies,communicationservices.Distributedalgorithmsandprotocols:examplesofdistributedalgorithms,clocksynchronization,logicalandvectorclocks,electionalgorithms,consensusalgorithms,proofofcorrectness,complexityanalysis.Distributedoperatingsystems:systemmodels,fileservices,nameservices,processsynchronizationandcoordination,casestudies.

Unit 3

Distributedsharedmemory,algorithmsforimplementingDSM,coherenceprotocols.Distributedresource management:loadsharing,loadbalancing,resourcemonitoring.Failurerecoveryandfaulttolerance:check-pointing,recovery,fault-tolerantmodelsandprotocols.Researchissuesindistributedsystems,realtimeprotocols,standardizationissues,clusterandgridcomputing.

BooksRecommended:

1. VijayK.Garg,JohnWileyandSons,ElementsofDistributedComputing
2. DistributedComputing:Fundamentals,Simulations,andAdvancedTopicsByHagitAttiya,JenniferWelch

Course No: CSE-761217

Advanced DBMS

Objective: The objective of this course is to give students indepth information about data storage, representing data elements, query processing and optimization, advanced transaction processing concepts, concurrency control techniques and database recovery techniques. This course also introduces the concept of distributed databases and parallel databases.

Unit 1

Integrity, ER diagrams and Dependency: Relational model conformity and integrity, Integrity Constraints revisited, Extended ER diagram, relationships of higher order degree. Multivalued and Join Dependency, Fourth and Fifth normal forms.

Advanced SQL PL/SQL: PL/SQL Variables, Control structure, PL/SQL Transactions, Exceptions, Savepoint, Cursor's.

PL/SQL Database Objects: Procedures, Functions, Packages, Triggers, View updates.

Programmatic SQL: Embedded SQL, Dynamic SQL, ODBC Standard.

Unit 2

Query Processing and Optimization: Valuation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information.

Objected Oriented and Object Relational Databases: Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference. Architecture of Object Oriented and Object Relational Databases.

Unit 3

Parallel and Distributed Databases: Distributed Data Storage, Fragmentation and Replication, Location and Fragment transparency. Distributed query processing and Optimization, Distributed transaction modeling and Concurrency control, Distributed deadlock, Commit protocols, Design of Parallel databases, Parallel Query evaluation.

AdvancedTransactionProcessing: NestedandMultilevelTransactions,CompensatingTransactionsandSaga,Longdurationtransactions,Weaklevelsofconsistency,Transactionworkflows,Transactionprocessingmonitors.

BooksRecommended:

1. AbrahamSilberschatz,HenryKorth,andS.Sudarshan,DatabaseSystemConcepts,McGrawHill.
2. AdvancedDatabaseManagementSystem,RiniChakrabarti,ShilbhadraDasgupta
3. J.D.Ullman,PrinciplesofDatabaseSystems,Galgotia.
4. R.ElmasriandS.Navathe,FundamentalsofDatabaseSystems8,Addison-Wesley.
5. SergeAbiteboul,RichardHullandVictorVianu,FoundationsofDatabases.Addison-Wesley.

CourseNo:CSE-761317

JavaProgramming

Objective: *Theaimofthecourseistoprovidestudentstheknowhowofjavaprogrammingconcepts,designof applicationsusingmultithreading,javaawt,collectionsandJDBC.*

Unit 1

IntroductiontoJavaprogramming,Featuresofjavaprogramming,JavaVirtualMachine,Variables,datatypes,andOperators.SingleandMultidimensionalarrays,ControlStatementsandLoopingStructures.ClassFundamentals,Objectreference,GarbageCollection,Constructors,AccessControl,Modifiers,Methods,MethodOverloading,DealingwithStaticMembers,Useof"this"reference,InheritanceinJava,OverridingSuperclassmethods,Useof"super",AbstractClass,Interfaces.

Packages,Importingpackages,ExceptionsHandling,ControlFlowInExceptions,Useoftry,catch,finally,throwinExceptionHandling.

Unit 2

Multi-ThreadedProgramming,ThreadLife-Cycle,ThreadPriorities,SynchronizingThreads,Inter-communicationofThreads,GUIProgrammingwithJava,TheAWTclasshierarchy,IntroductiontoSwing,Swingvs,AWT,HierarchyforSwingcomponents,Containers,JFrame,JApplet,JDialog,JPanel.Overviewofsomeswingcomponents,simpleswingapplications,Layoutmanagement-Layoutmanagertypes-border,gridandflow.

Eventhandling,Eventsources,Eventclasses,EventListeners,RelationshipbetweenEventsourcesandListeners,Delegationeventmodel,Examples:handlingabuttonclick,handlingmouseevents,Adapterclasses.

Unit 3

IntroductiontoJavaCollections,OverviewofJavaCollectionframework,Generics,CommonlyusedCollectionclassesArrayList,TreeList,Hashtable,Stack,Enumeration,Iterator,StringTokenizer,Scanner,CalendarandProperties

Files,streams,bytestreams,characterstreams,textinput/output,binaryinput/output,randomaccessfileoperations,FilemanagementusingFileclass.

ConnectingtoDatabase,JDBCType1to4drives,connectingtoadatabase,queryingadatabaseandprocess ingtheresults,updatingdatawithJDBC.

BooksRecommended:

1. HeadFirstJava,BertBatesandKathySierra
2. Java:Thecompletereference,HerbertSchildt
3. ThinkinginJavaByBruceEikel

Course No: CSE-761417

Digital Image Processing

Objective: *Theobjectiveofthiscoursetolearnandunderstandthefundamentalsofdigitalimageprocessing, variousimagetransforms,imageenhancementtechniques,imagerestorationtechniquesandmethods,imagecompressionandsegmentationusedindigitalimageprocessing.*

Unit 1

DigitalImageFundamentals: Fundamentalsofimageprocessing,applicationsofimageprocessing,elementsofvisualperception,imagesamplingandquantization,basicrelationshipbetweenpixels,basicgeometrictransformation.

Transformations: IntroductiontoFourierTransform,propertiesof2DFourierTransform,FFT,separableimagetransforms-Walsh,Hadamard,DiscreteCosineTransformandHaarTransform.

Unit 2

ImageEnhancement: Spatialdomainmethods-Basicgreyleveltransformation,Histogramequalization,Imagesubtraction,Imageaveraging.Spatialfiltering:Smoothing,sharpeningfilters,Laplacianfilters.Frequencydomainfilters:Smoothing,Sharpeningfilters.Homomorphicfiltering.

ImageDegradationandRestoration: ModelofImagedegradationandrestorationprocess,noisemodels,inversefiltering,Leastmeansquarefiltering,constrainedleastmeansquarefiltering,blindimagerestoration,pseudoinverse,singularvaluedecomposition.

Unit 3

ImageCompression: LosslessCompression-Variablelengthcoding,LZWcoding,bitplanecoding,predictivecoding.LossyCompression-Transformcoding,waveletcoding.Basicimagecompressionstandards-JPEG,MPEG.

EdgeDetectionandSegmentation: Edgedetection,thresholding,regionbasedsegmentationBoundaryrepresentation:chaircodes-Polygonalapproximation,boundarysegments,boundarydescriptors:simpledescriptorsFourierdescriptors,regionaldescriptors,simpledescriptors,texture.

BooksRecommended:

1. DigitalImageProcessingByRafaelC.Gonzalez,RichardEugeneWoods

2. FundamentalsofImageProcessingbyAnilK.JainPrenticeHall

CourseNo:CSE-772117

CloudComputing

Objective:Theobjectiveofthiscourseistoprovideaclearunderstandingofcloudcomputingconceptandclo udservices(SaaS,PaaS,IaaS).TOunderstandhowbusinessagilityinanorganizationcanbecreated.Evalu atethedeploymentofwebservicesfromcloudarchitecture.Compareeconomicbenefitsdeliveredbyvari ouscloudmodelsandstudythebestpracticemodeltoapplywhendevelopinganddeployingcloudbasedappli cations.

Unit 1

CloudComputingFundamental: Cloudcomputingdefinition,private,publicandhybridcloud.

Cloudtypes: IaaS(cloudinfrastructureasaservice),PaaS(cloudplatformasaservice),SaaS(cloudsoftwa reasaservice).Benefitsandchallengesofcloudcomputing,publicvsprivateclouds,roleofvirtualizationinen ablingthecloud.

BusinessAgility: Benefitsandchallengestocloudarchitecture.Applicationavailability,performance,secur ityanddisasterrecovery.

Unit 2

NextgenerationCloudApplications: Technologiesandtheprocessesrequiredwhendeployingwebservic es,deployingawebservicefrominsideandoutsidecloudarchitecture,advantagesanddisadvantages.

CloudServicesManagement: Reliability,availabilityandsecurityofservicesdeployedfromthecloud.Perfo rmanceandscalabilityofservices,toolsandtechnologiesusedtomanagecloudservicesdeployment.

Unit 3

CloudEconomics: Cloudcomputinginfrastructuresavailableforimplementingcloudbasedservices.Econ omicsofchoosingaCloudplatformforanorganization,basedonapplicationrequirements,economicconstr aintsandbusinessneeds.

ApplicationDevelopment: Servicecreationenvironmentstodevelopcloudbasedapplications.Developm entenvironmentsforservicedevelopment:Amazon,Azure,andGoogleApp.BestPracticeCloudITModel:A nalysisofcasestudieswhendecidingtoadoptcloudcomputingarchitecture.Howtodecideifthecloudisrightf

oryourrequirements？Cloudbasedservice,applicationsanddevelopmentplatformdeploymentsoastoimprovethetotalcostofownership（TCO）.

BooksRecommended:

1. RicardoPuttini,ThomasErl,andZaighamMahmood,"CloudComputing,Concepts,TechnologyandArchitecture".
2. M.J.Kevis,"ArchitectingTheCloud",Wiley.
3. R.Yeluri,"BuildingtheInfrastructureforCloudSecurity",ApressOpen.
4. B.Sosinsky,"CloudComputingBible".

Course No: CSE-772217

Embedded Systems

Objective: *ToprovideexposuretoembeddedprocessorsandknowledgeonMicrocontrollerprogramminga ndRealtimeoperatingsystemfeaturestoenabledesignofembeddedsystems.*

Unit 1

Introduction,characteristicsofembeddingcomputingapplications,conceptofrealtimesystems,challenge sinembeddedsystemdesign,designprocess,requirements,specifications,architecturedesign,designing ofcomponents,systemintegration.Embeddedsystemarchitecture,instructionsetarchitecture,embedded processor∕microcontrollerarchitecture,CISCexamples,RISCexample.

Unit 2

Memorysystemarchitecture,caches,virtualmemory,memorymanagementandaddresstranslation,I∕Os ub-system,co-

processors∕hardwareaccelerators,processorperformanceenhancement,pipelining,super-

scalarexecution,CPUpowerconsumption,designingembeddedplatforms,usingCPUbus,memorydevice sandtheircharacteristics,I∕Odevices,componentinterfacing,designingwithprocessors.

Unit 2

Implementationprogramming,programdesign,programminglanguages,operatingsystem,basicfeatures ofanoperatingsystem,kernelfeatures,real-timekernels,real-

timememorymanagement,I∕O,examplereal-

timeOS,evaluatingandoptimizingoperatingsystemperformance,networkbasedembeddedapplications, distributedembeddedarchitectures,internet-enabledsystems,wirelessapplications,embeddedcontrol.

BooksRecommended:

1. ComputersasComponents:principlesofembeddedcomputingsystemdesign,WayneWolf,MorganK aufman(HarcourtIndia).
2. ProgrammingforEmbeddedSystemsbyPrasad,Gupta,DasandSharma,WileyDreamTechIndiaPvtL td.

3. Embedded System Design: a unified hardware/software by Vahid and Givargis, John Wiley.
4. 8051 microcontroller and embedded systems by Keneth Ayala.

Course No: CSE-772317

Management Information System

Objective: *TounderstandMISinboththewidermanagerialcontextandinthenarrowerconfinesoftheselection,support,designanddevelopmentofcomputerapplications.Tofocusontheconceptsamanagerneedstounderstand,inordertomakeeffectiveuseof,computerisedinformationsystems*

Unit 1

Managingthedigitalfirmwhyinformationsystem?Perspectivesoninformationsystemcontemporaryapproachtoinformationsystemlearningtouseinformationsystems:Newopportunitieswithtechnology.Informationsystems,organizations,managementandstrategyorganizationsandinformationsystems.Howinformationsystemimpactorganizationsandbusinessfirms.TheimpactofITonmanagementdecisionmakingInformationbusinessandbusinessstrategy.

Unit 2

Decisionmaking,decisionmakingconcepts,decisionmethods,toolsandprocedures.Informationconcepts:aqualityproductclassificationofinformationmethodsofdataandinformationcollectionvalueofinformationgeneralmodelofahumanasainformationprocessor.DevelopmentofMIS,developmentoflongrangeplansofmisascertainingtheclassofinformationdeterminingtheinformationrequirementdevelopmentandimplementationofmismanagementofqualityinmisorganizationfordevelopmentofmis:thefactorsforsuccessandfailure.

Unit 3

ChoiceofInformationTechnologyIntroduction:NatureofITdecisionstrategicdecisionconfigurationdecisionevaluationinformationtechnologyimplementationplanchoiceoftheinformationtechnologyandthemanagementinformationsystem.Enterpriseapplicationsandbusinessprocessintegrationenterprisesystemssupplychainmanagementsystemscustomerrelationshipmanagementsystemsenterpriseintegrationtrends.DecisionsupportsystemDSS,conceptandphilosophyofDSS.

Booksrecommended:

1. ManagementInformationSystems-ByW.S.Jawdekar,SecondEdition.TMGPublications.

2. ManagementInformationSystems‑ManagingtheDigitalFirm‑
   ByKennethLaudonandJaneLaudonPHIPublications,NinthEdition.

3. ManagementInformationSystems‑ManagingtheDigitalFirm‑
   ByKennethLaudonandJaneLaudonPHIPublications,TenthEdition.

Course No: CSE-772417

E-Commerce

Objective: The objective is to understand the basic concept of electronic commerce, make business build customer loyalty, create an efficient channel for transactions with its customers (the distributors and suppliers included), the use of payment cards in electronic commerce and and capture the attention of customers and partners with online promotions and advertising. To provide the customers with the highest level of security ensuring that each transaction is delivered.

Unit 1

Business Models and Technological Infrastructure:

Electronic Commerce and electronic business, Incentives for engaging in electronic commerce, Advantages and disadvantages, Impact of E-commerce on business. E-Commerce Models: Network Infrastructure for E-Commerce, Internet and Intranet based E-commerce, Mobile Commerce, Characteristics, Wireless Application Protocol, Mobile Information device profile.

Unit 2

Web Security and Protocols:

Vulnerabilities on the web. SQL injection. Cross site request forgery, Data breach, Importance and types of firewalls, Factors to consider in firewall design, Limitation of firewalls; Digital Signatures, SET protocol, SSL protocol.

Unit 3

Electronic Payment Systems and Payment Gateway:

Electronic Payments-Overview, E-cheques, ATM transactions, Credit cards, Debit cards, Cash cards, POS, Internet banking, Payment gateway architecture and features, Mobile banking, Mobile wallets, Govt. policies and laws governing Ecommerce.

Books Recommended:

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison-Wesley.

2. Laudon, "E-Commerce: Business, Technology, Society", Pearson Education.

3. Bajaj and Nag, "E-Commerce the cutting edge of Business", TMH.

4. Turban, "Electronic Commerce 2004: A Managerial Perspective", Pearson Education.

Course No: CSE-853117

Advanced Computer Networks

*Objective:*Thiscourseaimstoprovideadvancedbackgroundonrelevantcomputernetworkingtopicstohaveacomprehensiveanddeepknowledgeincomputernetworks.

Unit 1

Routing: Overviewofroutingalgorithms,featuresofaroutingalgorithm,classification,shortestpathalgorithm,Dijkstraalgorithm,distancevectorandlinkstatealgorithm,routingbetweenpeers(BGP).

Asynchronoustransfermode:ATMprotocolarchitecture,ATMlogicalconnection,ATMcell,ATMservicecategories,AAL.

*MPLS:*BenefitsofMPLS,MPLSarchitecture,forwardinglabeledpackets,LDPoverview.

Unit 2

Multicast:IGMP,PIM,DVMRP,mobility,mobileIP.

FlowandCongestionControl: Windowandratebasedschemes,decbit.ATM-ABR;

QualityofService:IETFintegratedservicesmodel,differentiatedservicesmodel.

Unit 3

Flowidentification,packetclassifiersandfilters.

NetworkManagement:SNMP,CMIP.Issuesinthemanagementoflargenetworks.

Softwaredefinednetworking: Centralizedanddistributedcontrolanddataplane,openflow,introductionofSDNcontrollers.

BooksRecommended:

1. J.F.Kurose"ComputerNetworking"Addison-Wesley.

2. DouglasE.Comer,"InternetworkingwithTCP/IP,Volume1",PHI.

3. DouglasE.Comer,"InternetworkingwithTCP/IP,Volume2",PHI.

4. L.D.Ghein,"MPLSFundamentals",CISCO.

5. T.D.NadeauandK.Gray,"SoftwareDefinedNetworks",O'REILLY.

6. DouglasE.Comer,"Client-ServerProgrammingwithTCP/IP,Volume3",PHI.

Course No: CSE-853217

Advanced Computer Architecture

Objective: The objective of this course is to provide students knowledge of various architectures and techniques used for building high performance scalable multithreaded and multiprocessor systems. Give students knowledge of advanced hardware-based techniques for exploiting instruction level parallelism. Give students a broad and deep knowledge of contemporary computer architecture issues and techniques.

Unit 1

Single-threaded execution, traditional microprocessors, DLP, ILP, TLP, memory wall, parallel programming and performance issues, shared memory multiprocessors.

Unit 2

Synchronization, small-scale symmetric multiprocessors on a snoopy bus, cache coherence on snoopy buses, scalable multiprocessors, directory-based cache coherence, interconnection network.

Unit 3

Memory consistency models, Software distributed shared memory, multithreading in hardware, Chip multiprocessing, current research and future trends.

Books Recommended:

1. Advanced Computer Architectures: A Design Space Approach by Dezo Sima.

2. Computer Architecture and Parallel Processing by Kai Hwang, Fayé A. Briggs.

CourseNo:CSE-853317

DataMiningandWarehousing

Objective: *Tounderstandthebasicprinciples,conceptsandapplicationsofdatawarehousinganddatamining andtointroducethedataminingasimportantphaseofknowledgerecoveryprocess.*

Unit 1

DataWarehouse: Definitions,features,buildingblocks∕components,datamarts,metadataindatawarehouse,planningadatawarehouse,theprojectteam,projectmanagementconsiderations,

BusinessRequirements: Datadesign,thearchitecturalplan,datastoragespecifications,informationdeliverystrategy.

ArchitectureandInfrastructure: Conceptofdatawarehousearchitecture,operationalinfrastructure,physicalinfrastructure,hardwareandoperatingsystems.

Unit 2

PrinciplesofDimensionalModeling: Dimensionalmodelingbasics,useofcasetools,thestarschema,thesnowflakeschema,dataextraction,datatransformation,dataloading.

DataQuality: Need,dataqualitychallenges.

OnlineAnalyticalProcessing(OLAP): Features,functions,OLAPmodels,implementationconsiderations,OLAPplatforms,OLAPtoolsandproducts.

Unit 3

IntroductiontoDataMining: Definition,dataminingtechniques,applications.

PhysicalDesignindatawarehouse: Steps,physicaldesignconsiderations,physicalstorage.RAIDtechnology,estimatingstoragesizes.

Indexingthedatawarehouse:B‑TreeIndex,BitmappedIndex,ClusteredIndex.

PerformanceEnhancementTechniques: Datapartitioning,dataclustering,parallelprocessing,dataarrays,datawarehousedeployment.

BooksRecommended:

1. PaulrajPooniah,"DataWarehousingFundamentals,WileyandSons.

2. AlexBerson,StephenJ.Smith"DataWarehousing,DataMiningandOLAP,TataMcGrawHill,2004Te nthreprint2007.

3. SamAnahory,DennisMurray,"DataWarehousingintherealworld",PearsonEducation.

Course No: CSE-853417

Enterprise Java

Objective: *The objective of the course is to enable students to bulit Web applications using j2ee architecture with various j2ee components. Also to make students aware about server architectures and deployment of web applications on servers.*

Unit 1

Introduction to J2EE: J2EE architecture, J2EE APIs, J2EE containers, java server technologies, servlet.

Web Application Basics: Architecture and challenges of web application.

Introduction to Servlet: Servlet lifecycle, developing and deploying servlets, handling request and response, initializing a servlet, accessing database

Unit 2

Session Tracking and Management: Dealing with cookies, transferring request, accessing web context, passing INIT and CONTEXT parameter, sharing information using scope object.

Controlling concurrent access: User authentication, filtering request and response

Java Server Pages Technology(JSP): Basic JSP architecture, lifecycle of JSP(translation,compilation), JSP tags and expressions, role of JSP in MVC-2, JSP with database,

Unit 3

JSP Implicit Objects: Tag libraries, JSP expression language(EL), using custom tag.

JSP with JavaBean: RMI, example demonstrating RMI, enterprise JAVAbeans(EJB), types, advantages, lifecycles, session beans, stateful vs. stateless session beans, working with entity beans, message driven beans.

Books Recommended:

1. Effective Enterprise Java by Ted Neward.
2. Java Enterprise in a Nutshell: A Desktop Quick Reference.

Course No: CSE-864117

Wireless and Mobile Communication

Objective: *To introduce the concepts of wireless/mobile communication using cellular environment. To make the students to know about the various modulation techniques, propagation methods, coding and multi access techniques used in the mobile communication. Various wireless network systems and standards are to be introduced.*

Unit 1

Introduction: Wireless Networks, Wireless transmission, Frequencies for radio transmission, Signal propagation. Multipath Propagation

Spread spectrum: Direct sequence, Frequency hopping.

Medium Access Control: SDMA, FDMA, TDMA, CDMA.

Antenna: Role of Antenna, Types- isotropic radiator Omni-directional Antenna, directional and sectorized antenna.

Unit 2

Frequency Reuse: concept, channels, Co Channel interference, cell splitting, cell sectorization.

Cellular Wireless Networks: Brief introduction to 2 G, 2.5 G and 3 G networks.

Telecommunication Systems: GSM, Mobile services, System Architecture, GSM Channels, Components of wireless communication infrastructure: MS, BTS, MSC, HLR, VLR.

Data services: GPRS, EDGE and HSPA.

Handoff: Concept, Inter and Intra cellular Handoff, Mobile Assisted Handoff, soft and hard handoffs.

Unit 3

Wireless LANS: Introduction, Wireless LAN Technology, Infra Red Transmission, Radio Transmission.

WirelessLAN Standards: IEEE 8O2 Protocol Architecture, IEEE 8O2.11 System Architecture, Protocol Architecture & Services. Adhoc networks.

Mobile Internet: mobile network layer, concept of mobile IP, dynamic host configuration protocol, mobile transport layer, impact of mobility on TCP, indirect TCP, snooping TCP, Transaction oriented TCP.

BooksRecommended:

1. Mobile communications, 2nd Edn – Jochen Schiller, Pearson Education
2. Wireless Communication and Networks – William Stallings, Pearson Education
3. Wireless Communications, Principles and Practice 2nd Edn – Theodore S. Rappaport, PHI.
4. Wireless and Mobile Network Architectures – Yi-Bing Lin and ImrichChlamtac, Wiley
5. Principles of Wireless Networks – K. Pahlavan, P. Krishnamoorthy, PHI/Pearson Education, 2003.
6. Wireless Communications and Networking – J. W. Mark and W. Zhuang, Pearson.

Course No: CSE-864217

Robotics

Objective: The aim of Robotics is to teach students the principles of both controlled and automated robots. Design and documentation is a very important aspect of this. Students will utilize the engineering design process throughout the course to solve problems.

Unit 1

Introduction: An overview of robotics, automation and robotics, CAD/CAM and robotics, present and future applications, classification by coordinate system and control system.

Components of the Industrial Robotics: Function line diagram representation of robot arms, common types of arms, components, architecture, number of degrees of freedom, requirements and challenges of end effectors, determination of the end effectors.

Unit 2

Motion Analysis: Homogeneous transformations as applicable to rotation and translation problems.

Manipulator Kinematics: Specifications of matrices, D-H notation joint coordinates and world coordinates, forward and inverse kinematics problems.

Trajectory: Trajectory planning and avoidance of obstacles, path planning, skew motion, joint integrated motion, straight line motion robot programming. Languages and software packages.

Unit 3

Robot actuators and Feedback Components: Actuators-pneumatic, hydraulic actuators, electric and stepper motors.

Feedback Components: Position sensors-potentiometers, resolvers, encoders-velocity sensors.

Robot Application in Manufacturing: Material transfer Material handling, loading and unloading-Processing-spot and continuous arc welding and spray painting.

Books Recommended:

1. Robotics, FuKS, McGrawHill.

2. AnIntroductiontoRobotTechnology,P.CoiffetandM.ChaironzeKogamPageLtd.1983London.

3. RoboticEngineering,RichardD.Klafter,PrenticeHall

4. RobotAnalysisandIntelligence,AsadaandSlowtime/WileyInter-Science.

5. IntroductiontoRobotics,JohnJCraig,PearsonEdu.

6. RobotDynamicsandControl-MarkW.SpongandM.Vidyasagar,JohnWileyandSons(ASIA)Pvt.Ltd.

Course No: CSE-864317

Neural Network

Objective:Theobjectivesofthiscoursearetounderstandunderstandtheroleofneuralnetworksinengineering,artificialintelligence,andcognitivemodeling.Providetheknowledgeoflearningmethods.Providesthekn owledgeofsinglelayerandmultilayerperceptrons.Provideknowledgeofreinforcementlearningusingneur alnetworks.IntroducetheconceptofRadial-Basisfunctionnetworks,Self-OrganizingMapsandrecurrentnetworks.

Unit 1

NeuralNetworks: Introduction,biologicalneuralsystems,learningsystems-goalsandapplications,artificialneuralnetworks,artificialintelligenceandneuralnetworks,neuralnetworkm odelsandarchitecture.

AspectsofDevelopingaLearningSystem: Trainingdata,conceptrepresentation,functionapproximation, errorcorrectionlearning,memorybasedlearning,Hebbianlearning.

Unit 2

SingleLayerPerceptrons: Single-layerNNs,learninginsingle-layerNNs,leastmeansquarealgorithm,functionsminimizationandderivatives,gradientdescentlearningal gorithms,XORproblem,linearseparability.

MultilayerPerceptrons: LearninginmultilayerNNs,back-propagationalgorithm,heuristicforimprovingtheback-propagationalgorithm,stochasticgradientdescent,reinforcementlearning,discussiononconvergencean doptimization.

Unit 3

Radial-BasisFunctionNetworks: Interpolation,regularization,learningstrategies,self-organizingmap,SOMalgorithm,Learningvectorquantization,propertiesoffeaturemap,hierarchalvectorq uantizers,contextualmaps.

RecurrentNetworks:Hopfieldneuralnetwork.Boltzmannmachine.

BooksRecommended:

1. AnIntroductiontoNeuralNetworksByKevinGurney,CRCPress

2. NeuralNetworks:AComprehensiveFoundationbySimonHawkin.

3. MachineLearningbyTomMitchell,McGraw-HillPress,1997.

4. PatternRecognitionandMachineLearningbyChristopherM.Bishop,Springer.

5. AnIntroductiontoNeuralNetworks.GurneyUCLPress.

Course No: CSE-864417

Pattern Recognition

Objective:Theobjectiveofthiselectivecourseistomakestudentfamiliarwithvariousgeneralclassifiersandl atertoconcentrateonmoreoftenusedmodernclassificationtechniquessuchasMarkovChainandHiddenM arkovModels,ViterbiAlgorithm,Baum-

WelchAlgorithm,KalmanFiltering,Classifythedataobjectstorecognizethepattern.

Unit 1

Introductiontopatternrecognition,featuredetection,classification,reviewofprobabilitytheory,conditional probabilityandBayesrule.Randomvectors,expectation,correlation,covariance.Reviewoflinearalgebra,li neartransformations.Decisiontheory,ROCcurves,likelihoodratiotest.Linearandquadraticdiscriminants, Fisherdiscriminant.

Unit 2

Template-

basedrecognition,featureextraction.eigenvectorandmultilinearanalysis.TrainingMethods,maximumlik elihoodandbayesianparameterestimation.K-nearest-neighborclassification,non-parametricclassification,densityestimation,Parzenestimation.unsupervisedlearning,clustering,vectorq uantization,K-means.

Unit 3

Mixturemodeling,expectation-maximization.HiddenMarkovModels,ViterbiAlgorithm,Baum-WelchAlgorithm.LinearDynamicalSystems,KalmanFiltering.BayesianNetworks.Decisiontrees,multi-layerperceptrons.Reinforcementlearningwithhumaninteraction.Geneticalgorithm.

BooksRecommended:

1. PatternRecognitionbyWilliamGibson.
2. PatternRecognitionandClassification:AnIntroductionbyGeoffDoughertyGeoffDougherty.