Dept.ofMats,Statistics&ComputerScience

DescriptiveStatistics&ProbabilityDistribution-I

CO1:Organize,manageandpresentdataandAnalyzestatisticaldatausingmeasuresof central tendency

CO2:Analyzethestatisticaldatausingdispersion andlocation.

CO3:Usethebasicprobabilityrules,includingadditiveandmultiplicativelaws,usingthe terms, independent and mutually exclusive events.

CO4:Developthe probabilitydensityfunctionoftransformationofrandomvariables.

CO5:Identifyprobabilities,andderivethemarginalandconditionaldistributionsof bivariate random variables.

DescriptiveStatistics&ProbabilityDistributions-II

CO1:Usediscreteandcontinuousprobabilitydistributions,includingrequirements,mean and variance, and making decisions

CO2:Identifythecharacteristicsofdifferent discretedistributions.

CO3:Applythenormalprobabilitydistributionincludingstandardnormalcurvecalculations of appropriate areas.

CO4: Chooseexponential,betaandGammadistributionstosolvestatisticalproblems.

CO5:Developdifferent distributionstosolvevariousstatisticalproblems.

StatisticalMethodsandInference-I

CO1:Interpretthecorrelationbetween two variables.

CO2:Distinguishtheprinciplesoflinearregressionandcorrelation,includingleastsquare method, predicting a particular value of Y for a given value of X and significance of the correlation coefficient.

CO3:Showtheassociationbetweenthe attributes.

CO4:Generalizetheproperties of estimators.

CO5:Differentiate Maximumlikelyhoodestimationandmethodof moments

StatisticalInference-II

CO1:Developthedistributionalresultsneededforstatisticalinference.

CO2:Analyzehypothesestestsofmeans,proportionsandvariancesusingbothone-andtwo- sample data sets.

CO3:Explain Chi-Squaredtestforindependenceofattributesandgoodnessoffit.

CO4:Differentiatebetweenthetestsstatisticstobeusedfordependentandindependent samples.

CO5:Designthetest statistictobe used whenthenatureofthedistributionis unknown.

AppliedStatistics-I

CO1:Classifytheanalysisofvarianceofone-wayandtwo-wayclassifications.

CO2: Design experiments, carry them out, and analyze the data they yield

CO3: Tell the difference between CSO and NSSO.

CO4:Demonstrateunderstandingoftheconceptsoftimeseriesanditsapplicationsin different areas.

CO5:Differentiatevariousmeasures ofsecular trendand seasonal indices

AppliedStatistics–II

CO1:Analyzetheconceptsofqualitycontrol,chanceandassignablecausesofvariation, control charts for variables and attributes.
CO2: Classify tolerance limits, specification limits and process capability limits.
CO3:Selectthe appropriate index numbers and calculate an indices from given data
CO4:Constructthecostoflivingindexnumbersandwholesalepriceindexnumbers.
CO5:Developtheknowledgeonvitalstatistics,and calculatefertilityrates fromgivendata

OperationsResearch
CO1:Identifythevarioustechniquesofoperationsresearchandtotranslateareal–world problem, given in words, into a mathematical formulation.
CO2:Constructthesimplextableandtoplantheoptimumresults.
CO3:Use theprogramforoptimizingthecostinvolvedintransportationproblems
CO4:Developandsolvetransformationmodelsand assignmentmodels
CO5:Designthesequence ofjobs andto makeupthetotalprocess time

DesignofSampling Surveys
CO1:Analyzethepractical issuesarisinginsamplingstudies.
CO2:Explaintheconceptsofsimplerandomsamplingwithandwithoutreplacement.
CO3:Distinguishbetween simplerandom samplingandstratifiedrandom sampling.
CO4:Comparesimplerandomsampling,stratifiedrandomsamplingandsystematic sampling.
CO5:Choosetheequilibriumpriceandquantityfromatableofpricesandtherelated quantity supplied and quantity demanded

AdvancedOperationsResearch
CO1:Analyzevarious queuingmodelsandobtainthe leastwaitingtime.
CO2:construct thenetworkmodelsanddetermine thestartandfinishtime.
CO3:Designnewsimplemodels,likeCPM,PERTtoimprovedecision–makingand develop critical thinking and objective analysis of decision problems.
CO4:Identifythesaddle pointfor gameswithmixedstrategies.
CO5:Constructthedifferentmodelsinvolvedingame theory.

AbstractAlgebra
CO1:Demonstrateimportantmathematicalconceptsinabstractalgebrasuchasdefinitionof a group, order of a finite group and order of an element.
CO2:**Analyze**differenttypesofsubgroupssuchasnormalsubgroups,cyclicsubgroupsand understand the structure and characteristics of these subgroups
CO3:**Solve**thealgebraic problemsusingappropriate techniques.
CO4:**Analyze**theknowledgeandunderstandingoffundamentalconceptsincludinggroups, subgroups, normal subgroups, homomorphism and isomorphism.
CO5:Demonstrateknowledgeandunderstandingofrings, fieldsandtheir properties.

DifferentialCalculusAndDifferentialEquations:
CO1: Classify the differential equations with respect to their order and linearity.Solve differentialequationsoffirstorderusingnumericalandanalyticalmethodssuchas

IntegratingFactors.

CO2:**Analyze**andSolvebasicapplicationproblemsdescribedbyfirstorderdifferential equations. Such as orthogonal trajectories

CO3:**Solve**secondorderHomogeneousEquationswithConstantCoefficients.Obtainexact and numerical solutions using differential equations technology.

CO4:**Construct**thevector-valuedfunctionsofarealvariableandtheircurves,Gradient vector fields and constructing potentials.

Co5:Identifythedifferentialideasofdivergence,curl,andtheLaplacianalongwiththeir physicalinterpretations.

Discrete Mathematics

CO1:Developunderstanding ofLogicSetsandFunctions

CO2:**Understand**BooleanalgebraandbasicpropertiesofBooleanalgebra;abletosimplify simple Boolean functions by using the basic Boolean properties.

CO3:**Develop**anunderstandingofhowgraphandtreeconceptsareusedtosolveproblems arising in the computer science

CO4:**Evaluate**andapplythefundamentalconceptsingraphtheory

CO5:Applygraphtheorybasedtoolsinsolvingpracticalproblems.

ElementaryNumberTheory

CO1:ExpresstheconceptsandresultsofNumber Theory.

CO2:**Demonstrate**knowledgeandunderstandingoftopicsincluding,divisibility,prime numbers, congruences,Diophantine equations.

CO3:**Identify**methodsandtechniquesused innumber theory.

CO4:**Solve**challengingproblemsinNumber Theory.

CO5:Developadeeper conceptualunderstandingofthetheoreticalbasisof number theory andcryptography.

FunctionsofComplex Variables

CO1: Represent complex numbers algebraically and geometrically, define and analyze limitsandcontinuityforcomplexfunctionsaswellasconsequencesofcontinuity.

CO2:**Apply** the concept and consequences of analyticity and the Cauchy-Riemann equationsandofresultsonharmonicandentirefunctionsincludingthefundamental theorem of algebra.

CO3:**Analyze**sequencesand seriesofanalytic functionsandtypesof convergence.

CO4:**Solve**complexcontourintegralsdirectlyandbythefundamentaltheorem,applythe Cauchy integral theorem in its various versions, and the Cauchy integral formula.

CO5:Classifysingularitiesandpoles,findresiduesandevaluatecomplexintegralsusingthe residue theorem. Represent functions as Taylor, power and Laurent series

LaplaceTransformsAndFourierSeries

CO1:SolvetheLaplacetransformofstandardfunctionsfrom the definitions.

CO2:**Use** theappropriateshifttheoremsinfindingLaplaceandinverseLaplace transforms

CO3:**Combine**thenecessaryLaplacetransformtechniquestosolvesecond-orderordinary differential equations.

CO4:**Analyse**theFourier transformofelementaryfunctions fromthe definition.

CO5:DeveloprealandcomplexformsoftheFourierseriesforstandardperiodicwaveforms and convert from real-form Fourier series to complex-form and vice-versa.

Linear Algebra

CO1:Constructmathematicalargumentsthatrelatetothestudyofintroductorylinear algebra.
CO2:**Solve**thecharacteristicpolynomial, eigenvectors,eigenvalues.
CO3:**Analyze**finiteandinfinitedimensionalvectorspacesandsubspacesoverafieldand their properties, including the basis structure of vector spaces
CO4: **Use** the definition and properties of linear transformations and matrices of lineartransformationsandchangeofbasis,includingkernel,rangeandisomorphism.
CO5:Explainorthogonalityonvectorspacesandcomputeinnerproductsand,including Gram-Schmidt orthogonalization

NumericalAnalysis

CO1:Categorize thetheoreticalandpractical aspectsof theuseofnumericalmethods.
CO2:**Explain**howthecommonnumericalmethodsandareusedtoobtainapproximate solutions to intractable mathematical problems.
CO3: **Develop** numerical methods for various mathematical operations and tasks, such as interpolation,differentiation,integration,thesolutionoflinearandnonlinearequations, and the solution of differential equations.
CO4:**Analyse**andevaluate theaccuracyofcommonnumericalmethods.
CO5:Selectappropriatenumericalmethodstoapplytovarioustypesofproblemsin engineering and science in consideration of the mathematical operations.

Real Analysis

CO1:Categorize thereallineasa complete,orderedfield.
CO2:**Use** thedefinitionsofconvergenceastheyapplytosequences,series,andfunctions.
CO3:**Identify**thecontinuity,differentiability,andinerrabilityoffunctionsdefinedon subsets of the real line.
CO4:**Apply**theMeanValueTheoremandtheFundamentalTheoremofCalculusto problems in the context of real analysis.
CO5:ExplaintheRiemannintegrabilityandtheRiemann-Stieltjesintegrabilityofabounded function and prove a selection of theorems concerning integration.

Solid Geometry

CO1:Usekeystandards andconventionstocommunicategraphic ideasandinformation
CO2:**Demonstrate**knowledgeand understandingofplaneandsolidgeometry.
CO3: **Develop** factual knowledge including the mathematical notation and terminology ingeometry; points, lines, and angles; planar figures.
CO4:**Evaluate**thesurface areaof sphere -greatcircleandvolumeof sphere, cone.
CO5: Explain the properties of a cylinder. Measure and determine the surface area andVolume of a cylinder.

FundamentalsOfInformation Technology

CO1:Understandbasiccomputerterminologyand numbersystems
CO2:Explain aboutoperatingsystems, andits types
CO3:Applymodernmeansof communications,typesofnetworksand topologies
CO4:Identifydifferentapplications ofInformationsystem
CO5:ClassifyInternetandnetworks

ProblemSolvingandProgrammingthroughC

CO1:Understandthebasicintroductionofcomputer andprogramminglanguage
CO2:Identify'C'datatypes,operatorsand datainput/outputfunctions
CO3:Categorize'C'controlstructures, arrays and stringconcept
CO4:Explain 'C'function,recursion,pointers anddynamicmemoryallocation
CO5:Expresstheconceptofstructures,unionandfilehandlingin'C'.

C++andNumericalMethods

CO1:UnderstandC++programmingbasics ,operators ,datatypes
CO2: Apply constructors and destructors
CO3:ExplainInheritance,polymorphism
CO4: Create classes for file streams
CO5:Develop solutionsofequationswithnumericalanalysis

DataBaseManagement Systems

CO1:Describe EntityRelationshipandEnhancedERmodel.
CO2:Understand therelationalmodel,reductiontorelationschema,relationalalgebraand normalization
CO3:IdentifySQL-thestandardlanguageofrelationaldatabasesandPL/SQL programming
CO4:Explainthestorageandfilestructure,storageaccess,indexingandhashingtechniques of the database
CO5:Understandtheconcept ofTransactions,recovery systemand concurrency control.

SystemAnalysisand Design

CO1:Understandthesystemdevelopment environment
CO2:Applythestructuringsystemrequirements
CO3:Explain designobjectivesandtransform analysis
CO4:Identify Objectorientedsystemdesignand development
CO5:ConstructUMLdiagrams

ComputerNetworks

CO1:Understandandidentifybasiccomputernetworktopologiesandprotocolsandexplain Data Communication System components and functions of each layer in OSI model and its protocols.
CO2:Classifydifferenterrordetecting techniques.
CO3:Create skillsofsub-nettingandroutingmechanisms.

CO4:Identifydifferentinternetworkingdevices
CO5:ComparedifferentOSIupper layers

Java Programming

CO1:Understandjavaprogramstructureanddifferentiatebetweenobject-oriented programming and procedure- oriented programming.
CO2:ApplyOperatorsandexpressions,decisionmakingandclasses,objectsandmethod s concepts
CO3:Explain UseofArrays,StringsandPackages
CO4:SolveMultithreading,exceptionhandlingmechanism,withbasicappletprogramming
CO5:Develop interactiveprograms usingapplet workingwithgraphics AWT

OperatingSystems

CO1:IdentifythemaincomponentsofanOS&their functions
CO2:Analyze variousissuesinInterProcessCommunication(IPC)andtheroleofOSin IPC.
CO3:ExplainProcesssynchronization,Deadlocks-deadlockcharacterization,methodsfor handling deadlocks
CO4:ComparetheconceptsandimplementationMemorymanagementpoliciesandvirtu al memory
CO5:Understand theworkingofanOSasaresourcemanager,filesystemmanager,process manager, memory manager and I/O manager and methods used to implement the different parts of OS

SoftwareEngineering

CO1:Explain engineering throughvariousprocess models.
CO2:Identifyanalyze Requirements,ObjectOrientedandvarious modeling's.
CO3:Categorizedesign and architecture
CO4:ClassifyComponents,goldenrulesand designevaluation
CO5:Understandtestingtechniques toevaluatequalitymetrics