IKGPUNJABTECHNICAL UNIVERSITY KAPURTHALA

SchemeandSyllabus of Masters in Computer Applications (MCA)

Batch2015Julyonwards

By

Boardof StudiesComputer Applications

FirstSemesterContact Hours: 34 Hrs.

Course Code	CourseTitle	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA101	InformationManagement	4	1	-	40	60	100	5
MCA102	ObjectOriented Programmingin C++	4	1	-	40	60	100	5
MCA103	ComputerOrganization and AssemblyLanguage	4	1	-	40	60	100	5
MCA104	Accounting&Financial Management	4	1	-	40	60	100	5
MCA105	TechnicalCommunication	3	1	2	40	60	100	5
MCA106	Software Lab-I (Information Management)	-	-	4	60	40	100	2
MCA107	Software Lab –II(ObjectOriented Programmingin C++)	-	-	4	60	40	100	2
	Total	19	5	10	320	380	700	29

* Therewill benopracticalexaminationforTechnicalCommunication.Facultymustincludethe performanceininternalassessmentof theory.

SecondSemesterContact Hours: 35 Hrs.

Course Code	CourseTitle	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA201	MathematicalFoundationsof ComputerScience	4	1	-	40	60	100	5
MCA202	RelationalDatabaseManagement System	4	1	-	40	60	100	5
MCA203	DataStructures	4	1	-	40	60	100	5
MCA204	Data CommunicationandNetworks	4	1	-	40	60	100	5
MCA205	LinuxOperatingSystem	4	1	-	40	60	100	5
MCA206	Software Lab –III(Relational DatabaseManagementSystem)	-	-	4	60	40	100	2
MCA207	Software Lab –IV(Data Structures)	-	-	4	60	40	100	2
MCA208	Software Lab –V(Based on-LinuxOperatingSystem)		-	2	60	40	100	1
	Total	20	5	10	380	420	800	30

ThirdSemesterContact Hours: 33Hrs.

Course Code	CourseTitle	Load Allocation			Marks Distribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA301	DatabaseAdministration	4	1	-	40	60	100	5
MCA302	Information security	4	1	-	40	60	100	5
MCA303	Software Engineering & Project Management	4	1	-	40	60	100	5
MCA304	Java Programming	4	1	-	40	60	100	5
MCA305	Elective	4	1	-	40	60	100	5
MCA306	Software Lab-VI[Database Administration]	-	-	4	60	40	100	2
MCA307	Software Lab-VII[Java Programming]	-	-	4	60	40	100	2

FourthSemesterContact Hours:32Hrs.

Course Code	CourseTitle	Load Allocation			MarksDistribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA401	MobileApplicationDevelopment	4	1	-	40	60	100	5
MCA402	E-Commerce&Web ApplicationDevelopment	4	1	-	40	60	100	5
MCA403	InteractiveComputerGraphics	4	1	-	40	60	100	5
MCA404	AdvancedOperatingSystems	4	1	-	40	60	100	5
MCA405	SoftwareLab-VIII(Web& MobileApplication Development)	-	-	6	60	40	100	3
MCA406	SoftwareLab-IX(Interactive ComputerGraphics)	-	-	4	60	40	100	2
	Total	16	4	10	280	320	600	25

* Students willundergo 6-8 weeksindustrialtrainingafter4thsemester.Examinationwill beconductedalongwith5thsemesterpractical.

FifthSemesterContact Hours:32Hrs.

Course Code	CourseTitle	Load Allocation			MarksDistribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA501	Artificial Intelligence	4	1	-	40	60	100	5
MCA502	Design and analysis of algorithms	4	1	-	40	60	100	5
MCA503	WebTechnologies	4	1	-	40	60	100	5
MCA504	ObjectOrientedAnalysis& DesignwithUML	4	1	-	40	60	100	5
MCA505	SoftwareLab–XI(Web Technologies)	-	-	4	60	40	100	2
MCA506	SoftwareLab–XII(Object OrientedAnalysisand DesignwithUML)	-	-	4	60	40	100	2
MCA507	IndustrialTraining*	-	-	-	-	-	-	S/U
	Total	16	4	8	280	320	600	24

SixthSemester Contact Hours:34Hrs

Course Code	Course Title	Load Allocation			MarksDistribution		Total Marks	Credits
		L	T	P	Internal	External		
MCA601	DataWarehousing& Mining	4	1	-	40	60	100	5
MCA602	CloudComputing	4	1	-	40	60	100	5
MCA603	AdvancedComputer Architecture	4	1	-	40	60	100	5
MCA604	SoftwareTesting& QualityManagement	4	1	-	40	60	100	5
MCA605	SoftwareLab-XIII(SofwareTesting)	-	-	2	60	40	100	1
MCA606	Project	-	-	8	180	120	300	8
	Total	16	4	10	400	400	800	29

ListofElectives:

CourseCode	(MCA305) Elective	CourseCode	(MCA305)Elective
MCA305A	SystemProgramming	MCA305C	Embedded system
MCA305B	TheoryofComputation		

MCA-101InformationManagement

Section-A

Introduction to InformationTechnology - Definition, Applications in various sectors, Differenttypesofsoftware,Generationsof Computers,InputandoutputDevices,Various storage deviceslike HDD, OpticalDisks,FlashDrives.DifferentTypesof data file formats: Typesand Applications.

Section-B

ITInfrastructureinIndia– Telecommunication,Internet research andBroadband

Data Collection and DataManagement, Data Models,Information vs. Knowledge, Various techniques to derive information,Information Management.

Section–C

Management InformationSystem–Definition,Strategic ManagementofInformation, DecisionMaking,Development Processof MIS,StrategicDesignofMIS,Business Process Reengineering.

Understanding Knowledge Management, Designing a Knowledge Management System,NatureandScopeofBusiness Intelligence, InformationSecurity-Meaningand Importance,OrganizationalSecurity Policy andPlanning,AccessControlandOperations Security.

Section–D

Office Automation(Word processing, Spreadsheet, Presentation, E-Mail Clients), ContentManagement System andArchitecture.

SuggestedReadings/Books:

IntroductiontoInformationTechnology,SecondEdition,Turban,Rainer,Potter,WSE,WileyIndia.

DataWarehousingFundamentals:A

ComprehensiveStudyforITProfessionals,PaulrajPonnianBWSTN,WileyIndia.

InformationAssurance ForTheEnterprise: A RoadmapToInformationSecurity-CoreySchou, DanielShoemaker,Mc-GrawHillPublications.

ManagementInformationSystem:TextAndCases,WamanJawadekar,Mc-GrawHillPublications.

MCA-102ObjectOrientedProgramminginC++

Section-A

EvolutionofOOP, OOP Paradigm, advantages ofOOP, Comparisonbetween functional programming and OOP Approach, characteristics ofobject orientedlanguage – objects, classes,inheritance,reusability,user defineddata types,polymorphism,overloading. Introduction toC++,Identifier andkeywords,constants,C++ operators,type conversion, Variable declaration,statements,expressions,featuresof iostream.hand iomanip.hinputand output, conditional expression loop statements, breakingcontrol statements.

Section-B

Defining function, types of functions, storage class specifiers, recursion, pre-processor, headerfilesand standardfunctions, Arrays, pointerarithmetic's,structures,pointersand structures, unions, bit fieldstyped,enumerations.Passingarrayas anargument to function.

Section-C

Classes, memberfunctions, objects, arrays ofclass objects, pointersand classes, nested classes, constructors, destructors, inline member functions, static class member, friend functions,dynamicmemoryallocation. Inheritance,singleinheritance,typesofbaseclasses, types of derivations, multipleinheritance,containerclasses, member accesscontrol

Section-D

Function overloading, operator overloading, polymorphism, earlybinding, polymorphism with pointers,virtualfunctions, virtual destructors, late binding, pure virtual functions, openingandclosingoffiles,streamstatememberfunctions,binary fileoperations,structures andfileoperations,classesandfile operations, randomaccessfileprocessing.Exception Handling.

SuggestedReadings/Books:

ObjectOrientedProgramminginTurbo C++,RobertLafore,GalgotiaPublications, 1994.

TheC++ProgrammingLanguage, BjarneWesleyPublications, 1994.

ObjectOrientedProgrammingwithC++,E.Balagurusamy,Tata McGrawHill

ObjectOrientedSoftwareEngineering,S.HalladayandM.Wiebel,BPBPublications, 1995.

MCA-103ComputerOrganizationandAssemblyLanguage

Section-A

ComputerOrganization:BasicComputerOrganization,Bus& MemoryTransfer,StoredProgram Organization, ComputerRegisters,Computer Instructions, Timingand Control, Hardwiredbaseddesignof ControlUnit,InstructionCycle,FormatsofVarioustypesof Instructions-Memory ReferenceInstructions,RegisterReferenceInstructions&I/O Instructions, GeneralRegisterOrganization-Control word,DesignofAdder&LogicUnit, Stack Organization-Register Stack, MemoryStack, Reverse Polish Notation, Addressing Modes, RISC vsCISCArchitectures,Interrupts &types.

Section-B

Pipeline&VectorProcessing:Parallel Processing, Pipelining-Arithmetic &Instruction Pipeline, Vector Processing-Vector operations, MemoryInterleaving, ArrayProcessors.

Input – Output Organization: Input-Output Interface- I/O vs Memory Bus,Isolated vs Memory mappedI/O,SynchronousDataTransfer,AsynchronousDataTransfer-StrobeControl, Handshaking,Asynchronous Communication Interface,ModesofTransfer-Programmed I/O, InterruptInitiated I/O,InterruptCycle,PriorityInterruptController,DMAController&DMA Transfer.

Section-C

Memory Organization: Main Memory-Memory Address Map, Memory connection to CPU, Associative Memory-Hardware organization,MatchLogic, CacheMemory-Levelsof Cache,AssociativeMapping,DirectMapping,Set-AssociativeMapping,writing intoCache, Cachecoherence,VirtualMemory-Addressspace&Memory space,Addressmappingusing pages,Associativememorypagetable,Pagereplacement.MemoryManagementHardware– Segmented page mapping,Multiportmemory, Memory protection.

Section-D

Multiprocessors: CharacteristicsofMultiprocessors,Interconnectionstructures-Time Shared CommonBus,Crossbarswitch,MultistageSwitching Network,Hypercubeinterconnection, Interprocessorcommunication &synchronization.

AssemblyLanguage Programming:Example ofatypical8bitprocessor(8085 microprocessor)—Registers, Addressingmodes, Instruction Set-Data transfer Instructions, ArithmeticInstructions,LogicalInstructions, ProgramControlInstructions,Machine Control Instructions,UseofanAssembly Languageforspecificprogrammes:Simplenumeric manipulations, Sortingof alist and useofI/O instructions.

SuggestedReadings/Books:

ComputerOrganization-CarHamacher,ZvonksVranesic,SafwatZaky,VEdition, McGrawHill.

ComputerSystemArchitecture,Mano,M.M.,1986: PrenticeHallofIndia. Computer Architectureand Organization, John Paul Hayes: McGraw-Hill International Edition

StructuredComputerOrganization,Tanenbaum, A.S.:PrenticeHallofIndia.

MCA-104AccountingandFinancial Management

Section-A

Accounting: Principles, conceptsandconventions,double entrysystem of accounting, introductiontobasicbooksofaccountsofsoleproprietaryconcern,partnership, organization &company,closingofbooks ofaccountsand preparation of trial balance.

Final Accounts: Trading,ProfitandLossaccountsand Balancesheet (without adjustment)

Section-B

Financial Management: Meaning, scopeand role,abriefstudyoffunctional areas of financial management. Introduction tovarious FM tools: Ratio Analysis, Fund Flow statement and cashflowstatement (withoutadjustments)

Section-C

Costing:Nature,importanceandbasicprinciples,Marginalcosting:Nature scopeand importance,Breakevenanalysis,itsusesandlimitations,constructionof breakevenchart, Standardcosting: Nature,scope and variances,BudgetaryControl (onlyintroduction)

Section-D

ComputerizedAccounting: Advantages, ComputerPrograms foraccounting, Computer based Auditing.

SuggestedReadings/Books:

Principles:A Book-KeepingbyJ.C.Katyal

Principles ofAccountingbyJainandNarang,.

Financial ManagementbyI.M.Pandey,VikasPublications.

ManagementAccounting,bySharma,Gupta&Bhall,.CostAcc

ountingbyJainandNarang

CostAccountingbyKatyal,.

BasicAccounting,SecondEditionbyRajniSofat,PreetiHiro,PHI.

MCA-105TechnicalCommunication

Unit–I

Basics of Technical Communication- Functions of Communication-Internal &External Functions, Models-Shannon &Weaver's model ofcommunication, Flow,Networks and importance,Barriersto Communication,Essentialofeffectivecommunication(7C'sand otherprinciples), Non-verbal Communication.

Unit–II

BasicTechnicalWriting:Paragraph writing(descriptive,Imaginative etc.), Precise writing, readingandcomprehension,Letters– Format &various types.

Unit–III

Advanced TechnicalWriting:Memos,Reports,E-Mails&Netetiquettes,Circulars,Press Release,Newsletters, Notices.Resume Writing,TechnicalProposals,ResearchPapers, DissertationandThesis, TechnicalReports,InstructionManualsandTechnicalDescriptions, CreatingIndexes,ListofReferencesandBibliography.

Unit–IV

VerbalCommunication-Presentation Techniques,Interviews, GroupDiscussions, Extempore, Meetings and Conferences.

Unit–V

TechnicalCommunication-MS-Word, Adobe Frame makerand ROBOHelp

* LabExercisesbasedonListeningandSpeakingskills

SuggestedReadings/Books

VandanaRSingh, TheWrittenWord, Oxford UniversityPress, NewDelhi

KKRamchandran, et al BusinessCommunication, Macmillan, NewDelhi

Swati Samantaray,BusinesCommnicationand CommnicativeEnglish, Sultan Chand, NewDelhi.

S.P. Dhanavel English and CommunicationSkillsfor StudentsofScienceand Engineering (with audioCD)

MCA-106SoftwareLab-I(InformationManagement)

Thislaboratorycoursewill mainlycomprise of exercises on Section D of theCourseMCA-101 [InformationManagement]

MCA-107SoftwareLab-II(ObjectOrientedProgramminginC++)

Thislaboratorycoursewill mainlycomprise of exercises on what is learntunder paper: MCA 102 [ObjectOrientedProgramminginC++]

Note:Programshouldbefullydocumentedwithsimple I/Odata.Flowchartsshouldbedeveloped wherevernecessary.

Writeprogramin‘C++’language

- Usinginputand outputstatements
- Usingcontrol statements.
- Usingfunctions.
- Usingarray
- UsingClasses andimplementation ofConstructor and Destructor.
- Usingfiles.
- UsingOOP’s Concepts(Inheritance, Polymorphism, Encapsulation,Friendand Static Functions)

Second Semester

MCA-201MATHEMATICALFOUNDATIONSOFCOMPUTERSCIENCE

SectionA

A generalintroduction,simpleandmultipgrpahs,directedandundirectedgraphs,Eulerianand Hamiltonian Graphs, Shortest path algorithms, Chromatic number, Bipartite graph, graph coloring.

SectionB

SetsandRelations:Definitionofsets,subsets,complementofaset,universalset,intersection andunionof sets,De-Morgan's laws,Cartesianproducts,Equivalentsets,Countableand uncountable sets,minset, Partitions ofsets,Relations: Basic definitions, graphs ofrelations, propertiesofrelations

SectionC

Algebraoflogic,Propositions,Connectives,Tautologiesandcontradiction,Equivalenceand implication,PrincipleofMathematicalinduction,quantifiers.

SectionD

Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplicationof matrices,transposeetc.Squarematrices,inverseand rankof asquarematrix, solving simultaneousequations using Gauss elimination, Gauss Jordan Methods, Matrix Inversionmethod.

References:

AlanDoerr,"AppliedDiscreteStructuresforComputerScience",GalgotiaPublications.
Kolman andBusby "DiscreteMathematicalstructuresforComputerSciences"PHI.

MCA202:RelationalDatabaseManagementSystems

Section–A

ReviewofDBMS:
BasicDBMSterminology;ArchitectureofaDBMS:DataIndependence-PhysicalandLogical Independence, DegreeofData Abstraction, Initial Studyofthe Database, Database Design, ImplementationandLoading,TestingandEvaluation,Operation,MaintenanceandEvaluation.

ConceptualModel:
EntityRelationshipModel,ImportanceofERD,Symbols(Entity:TypesofEntities,weekEntity, Composite Entity, Strong Entity, Attribute: Types of Attribute, Relationship: Type of relationship,Connectivity,Cardinality).

Section–B

DatabaseModelsandNormalization:
ComparisonofNetwork,HierarchicalandRelationalModels,ObjectOrientedDatabase,Object Relational Database,ComparisonofOOD&ORD;Normalizationanditsvariousforms,De-Normalization, Functional Dependencies, Multi-valued Dependencies, Database Integrity: Domain,Entity,ReferentialIntegrityConstraints.

TransactionManagementandConcurrencyControl:
Client/ ServerArchitecture and implementation issues, Transaction: Properties, Transaction Management with SQL, Concurrency; Concurrency Control: Locking Methods: (Lock Granularity,LockTypes,TwoPhaseLocking,Deadlocks),TimeStampingMethod,Optimistic Method,DatabaseRecovery Management.

Section–C

DistributedDatabases:
Centralized Verses Decentralized Design; Distributed Database Management Systems (DDBMS): Advantage andDisadvantages; Characteristics, Distributed Database Structure, Components,DistributedDatabaseDesign,HomogeneousandHeterogeneousDBMS.

LevelsofDataandProcessDistribution:
SPSD(Single–SiteProcessing,Single-SiteData),MPSD(Multiple-SiteProcessing,SingleSite Data),MPMD(Multiple–SiteProcessing,Multiple-SiteData),DistributedDatabaseTransaction Features,TransactionTransparency,Client/ServerVsDDBMS.

Section–D

BusinessIntelligence andDecisionSupportSystem:
TheneedforDataAnalysis,BusinessIntelligence,OperationalDatavs.DecisionSupportData, DSSDatabasepropertiesandimportance,DSSDatabaseRequirements.

OLAPandDatabaseAdministration:
Introduction toOnline Analytical Processing (OLAP), OLAP Architecture Relational, Star Schemas,DatabaseSecurity,Databaseadministrationtools,DevelopingaDataAdministration Strategy.

References:

1. “DataBaseSystems”,PeterRobCarlosCoronel,CengageLearning,8th ed.

2. “DatabaseSystemConcepts”,Henry F.korth,Abraham,McGraw-Hill,4th ed.
3. “AnIntroductionToDatabaseSystems”,C.J.Date,PearsonEducation,8th ed.
4. ”PrinciplesofDatabaseSystems”,Ullman,GalgotiaPublication,3rd ed.
5. “AnIntroductionToDatabaseSystems”,BipinC.Desai,GalgotiaPublication

MCA-203 DATASTRUCTURES

SectionA

- IntroductiontoDataStructure:Conceptofdata,problemanalysis,datastructures anddatastructureoperations,notations,mathematicalnotationandfunctions,algorithmic complexity,Big-ONotationandtimespacetradeoff.

- OverviewofArrays,Recursion,Pointers,PointerArithmetic,Arrayof pointers, Arraysintermsofpointers,StaticandDynamicMemoryManagement, GarbageCollection.

- UnderstandingandImplementationofvariousDataStructureswithapplications

- Stack:operationslikepush,popandvariousapplicationslikeconversionfrom infixtopostfixandprefixexpressions,evaluationofpostfixexpressionusingstacks

- Queues:operationslikeenqueue,dequeueonsimple,circularandpriorityqueues.

- LinkedLists:operationslikecreations,insertion,deletion,retrievalandtraversalon single,circularanddoublylinkedlist.

SectionB

- Treesdefinitionsandconcepts:Root,Node,LeafNode,Level,Degree,Heightand TreerepresentationusingLinkedListandArray

- TypesofTrees:Binary trees,Binarysearchtree,Heightbalanced(AVL)tree, B-trees,B+Tree

- Treeoperations:creation,insertion,deletionandtraversals(Preorder,In-order, Post-ordered)and searchingonvarioustypesoftrees

- Heap:Definition,Structure,Algorithmsandapplications

SectionC

- Graphdefinitionsand concepts:Edge,Vertices,andGraphrepresentationusing Adjacencymatrix,Adjacencylists
- Typesofgraphs:Weighted,Unweighted,Directed,UndirectedGraphs
- Graphoperations:creation,insertion,deletion,traversalsandsearching(depth-first,breadth-first)ofvarioustypesofgraphsandDijkstra'salgorithmforshortest distancecalculation.

SectionD

- Searching:Conceptandefficiency oflinearandbinarysearchalgorithms.
- Sorting:Concepts,Order,Stability,Efficiencyofvariousalgorithms(Selection Sort,BubbleSort,InsertionSort,MergeSort,QuickSort,HeapSort,RadixSort)
- Hashing:Definition,Implementationandapplications

Note:

- Programsareto beimplementedinC++

Books:

- DataStructures–APseudocodeApproachwithC++ -GilbergandForouzan by Cengage
- Schaum'sOutlineofDataStructureswithC++- HubbardJohn.RbyTataMcGraw-Hill
- DataStructuresUsingCandC++-Langsam,Augenstein,TanenbaumbyPearson Education

MCA-204DATACOMMUNICATIONAND NETWORKS

Objectives:Aspartofthiscourse,studentswillbeintroducedtoComputerNetworksandData Communicationparadigms,aboutNetworkmodelsandstandards,Networkprotocolsand theiruse,wirelesstechnologies.

SECTION-A

Introduction toData Communication: Components of Data Communication, DataRepresentation,TransmissionImpairments,Switching,Modulation,Multiplexing.

Review of NetworkHardware: LAN, MAN, WAN, Wireless networks, Internetworks.

ReviewofNetworkSoftware:Layer,Protocols,Interfacesandservices.

ReviewofReference Models:OSI,TCP/IPandtheircomparison.

PhysicalLayer

Transmission Media: Twisted pair, Coaxial cable, Fiber optics, Wireless transmission (Radio, Microwave, Infrared). Introduction to ATM, ISDN, Cellular Radio and CommunicationSatellites.

SECTION-B

DataLinkLayer
ServicesprovidedbyDLL:FRAMING,ERRORCONTROL,FLOWCONTROL,MEDIUM ACCESS

MediumAccessSublayer
ChannelAllocation,MACprotocols–ALOHA, CSMAprotocols,Collisionfreeprotocols, LimitedContentionProtocols,WirelessLANprotocols,IEEE802.3,802.4,802.5standards andtheircomparison.

SECTION-C

NetworkLayer

Design Issues,RoutingAlgorithms (ShortestPath,Flooding,Distance Vector,Hierarchical, Broadcast, Multicast). Congestion Control Algorithms (Leakybucket, Token bucket, Load shedding),Internetworking,IPProtocol,ARP,RARP.

NetworkTroubleShooting

UsingPing,Traceroute,IPconfig,Netstat,nslookup

SECTION-D

TransportLayer

Addressing, Establishing and Releasing Connection, Flow Control, Buffering, Internet TransportProtocol(TCPandUDP).

ApplicationLayer

Domainnamesystem,E-mail,Filetransferprotocol,HTTP,HTTPS,WorldWideWeb.

SuggestedBooks:-

1.Tanenbaum,AndrewS.,2009:ComputerNetworks(4thEdition),PHI.

2. Forouzan, B. A., 2009: Data Communications and Networking, Fourth Edition, Tata McGrawHill.

3.DouglasE.Comer,2004:InternetworkingwithTCP/IP(Vol.1,4thEdition),CPE.

4.Stallings,William2008:DataandComputerCommunications(8thEdition),PHI.

5.Nance,Bary,1997:IntroductiontoNetworking,PHI,4thEdition.

MCA-205LINUXOPERATINGSYSTEM

SECTION–A

INTRODUCTIONTOLINUX OPERATINGSYSTEM:

IntroductionandTypesofOperatingSystems,LinuxOperatingSystem,Features,Architecture Of Linux OS and Shell Interface, Linux System Calls, Linux Shared Memory Management, Device and DiskManagementinLinux,Swapspaceanditsmanagement.File SystemandDirectoryStructureinLinux.Multi-Processing, loadsharingandMulti-Threading inLinux,TypesofUsersinLinux,CapabilitiesofSuperUsersandequivalents.

INSTALLING LINUX AS A SERVER : Linux and Linux Distributions ;MajordifferencesbetweenvariousOperatingSystems(onthe basisof:SingleUsersvs Multiusersvs NetworkUsers;SeparationoftheGUIandtheKernel;Domains;ActiveDirectory;).

INSTALLINGLINUX INASERVER CONFIGUARTION:BeforeInstallation;Hardware; ServerDesign;Dual-BootingIssues;ModesofInstallation;InstallingFedoraLinux; Creating a Boot Disk; Starting the Installation; GNOME AND KDE : The History of XWindows; TheDownside;EnterGNOME;AboutGNOME;StartingXWindowsandGNOME; GNOME Basics;TheGNOMEConfigurationTool.

SECTION-B

INSTALLINGSOFTWARE:TheFedoraPackageManager;InstallingaNewPackage using dpkgand RPM; Querying a Package; Uninstalling a Package using dpkgand RPM; Compiling Software; Getting and Unpacking the Package; Looking for Documentation; Configuringthe Package;CompilingYour Package;InstallingthePackage,Driver Supportfor variousdevicesinlinux.

MANAGING USERS: Home Directories ;Passwords; Shells; StratupScripts; Mail; User Databases; The / etc/passwdFile; The / etc/ shadow File; The / etc/group File; User ManagementTools;Command-Line User Management;UserLinuxConftoManipulateUsers andGroups;SetUIDandSetGIDPrograms

SECTION-C

THE COMMAND LINE : An Introduction to BASH, KORN, C, A Shell etc. ; BASH commands:Job Control;EnvironmentVariables;Pipes;Redirection;Command-LineShortcuts; DocumentationTools;ThemanCommand;thetext infoSystem;FileListings;Ownershipsand permissions; Listing Files; File and Directory Types; Change Ownership; Change Group; Change Mode ; File Management and Manipulation; Process Manipulation;Miscellaneous Tools;VariousEditorsAvailablelike:Vianditsmodes,Pico, Joeandemacs,,SuCommand.

SECTION-D

BOOTING AND SHUTTING DOWN: LILO and GRUB; Configuring LILO; AdditionalLILOoptions;Addinga NewKerneltoBoot;RunningLILO;TheStepsofBooting; EnablinganddisablingServices

FILE SYSTEMS: The MakeupFile Systems; Managing File Systems; Adding and PartitioningaDisk;NetworkFileSystems;QuotaManagement;

CORE SYSTEM SERVICES: The initService; The inetdand xinetdProcessess; The syslogdDaemon;ThecronProgram

PRINTING : The Basicof lpd; Installing LPRng; Configuring /etc/printcap; The /ETC/lpd.permsFile;Clientsoflpd,InterfacingPrinterthroughOperatingSystem.

References:

1. LinuxAdministration:ABeginner'sGuidebySteveShah,WaleSoyinka,ISBN 0072262591(0-07-226259-1),McGraw-HillEducation
2. UnixShellProgramming,YashavantP.Kanetkar
3. UNIXConceptsandApplicationsbySumitabhaDas
4. OperatingSystemConcepts8th edition,byGalvin

MCA206:SoftwareLab–III(RelationalDatabaseManagementSystem)

LearningObjectives:

1. ComparativestudyofvariousDatabaseManagementSystems
2. Data DefinitionLanguage (DDL), Data Manipulation Language (DML), and Data ControlLanguage(DCL)
3. HowtoapplyConstraintsatvariouslevels.
4. Viewdatainthe requiredformusing Operators,FunctionsandJoins.
5. CreatingdifferenttypesofViewsfor tailoredpresentationofdata
6. HowtoapplyConditionalControlsinPL/SQL
7. ErrorHandlingusingInternalExceptionsandExternalExceptions
8. UsingvarioustypesofCursors
9. HowtorunStoredProceduresandFunctions
10. CreatingPackagesandapplyingTriggers
11. CreatingArraysandNestedTables.

MCA-207 Software Lab–IV(DataStructures)

Listofpracticalexercises,tobeimplementedusingobject-orientedapproachinC++ Language.

1.[ARRAY]WriteamenudrivenprogramtoInsertanewelementatendaswellasatagiven position,Deleteanelementfromagivenposition,Tofindthelocationofagivenelement usinglinearsearch,Todisplaytheelementsof thelinear array.

2.[LINKEDLIST]WriteamenudrivenprogramtoInsertanewelement,Deleteanexisting element,Displayalltheelements.

3.WriteaprogramtoimplementPUSH& POPoperationonstack.

4.ProgramtoimplementINSERT&DELETEoperationoncircularqueuerepresentedusinga linear array.

5.Programtosortanarrayofintegersinascendingorderusingbubblesort.

6.Programtosortanarrayofintegersinascendingorderusingselectionsort.

7.Programtosortanarrayofintegersinascendingorderusinginsertionsort.

8.Programtosortanarrayofintegersinascendingorderusingmergesort.

9.Programtosortanarrayofintegersinascendingorderusingquicksort.

10.Programtodemonstratetheuseof binarysearchalgorithmtosearchagivenelementina sortedarray inascendingorder.

11.Programtoinsert,deleteanddisplayoperationsonabinarysearchtree.

12.Programtoillustratethetraversalofgraphusingbreadth-firstsearch.

13.Programtoillustratethetraversalofgraphusingdepth-firstsearch.

MCA-208
Software Lab-V(LINUXOPERATINGSYSTEM)

LearningObjectives:

1. HowtoinstalldifferentdistributionsofLinux(Fedora,redHat,OpenSuseetc.).
2. BootingandShuttingdownthesystem.
3. LearningtheuseofVIEditorforShellprogramming,Searching&SortingProcesses.
4 UserManagement
5. Packagemanagement.
6. File/DirectoryManagement.
7 InstallingPrinterandusingPrinterservices.
8. ProcessManagement.
9. SecurityandProtectionofsystem.
10. Privilegemanagement.
11. Managingvariousservices(Cron&Quotaetc)inLinux.
12. RunningaprojecttolearnoverallLinuxSystemUsage.

References:

1. LinuxAdministration:ABeginner'sGuidebySteveShah,WaleSoyinka,ISBN 0072262591(0-07-226259-1),McGraw-HillEducation
2. UnixShellProgramming,YashavantP.Kanetkar
3. UNIXConceptsandApplicationsbySumitabhaDas

ThirdSemester

MCA301DatabaseAdministration

Section-A
(Introduction)

UnderstandingroleandresponsibilitiesofDBA,DatabaseEnvironmentmanagement(network,CPU, disk andRAM), Installing andupgrading various database packages (MS SQLServer, Oracle,MySQL),Comparingvarious databasepackages,Configuringvariousservicesand components,Understandingthe client/servermodel,Communicationprotocols,Databaseinstance management,Creatingandmanagingvariousdatabaseobjects(tables,views,indexes)

Section-B (ManagingDatabaseServers)

Understatingclienttoolsfor administrativetasks,Task Automation,Implementingmigration, consolidation, and upgrade strategy, Hardware resource allocation, Business policy implementation,Monitoringand trouble-shooting,Implementingdatabasecompression,Database Replicationandmultipleservers,ExportingandImportingdata,ManagingDataintegrity

Section-C (Security andAvailability)

UnderstandingUserAccessandSecurity,Creatingand modifyinguseraccounts,Creating, Modifying and Using roles, Granting and Revoking Privileges, Querying role information, AuditingUser activity,Implementingdatabaseencryption,Databasebackup,restorationand recovery, Typesoffailure, Defining abackup and recoverystrategy, Testingthebackup and recoveryplan,RAIDimplementation,High-availabilityanddisasterrecovery

Section-D (PerformanceTuning)

Introduction toperformance tuningand itsrequirement, performance tuningmethodology and concepts,Monitoringstatusvariablesthataffectperformance,GeneralTableOptimizations, Using indexestoimproveperformance, Monitoring andoptimizingtheperformance ofthedatabase, Identifyingfull-tablescans,Re-writingSQL queries,Tuningsub-queries,Databasemirroring, clustering

Note:SubjectCoverage willbepreferablybasedonMySQL.

Reference Books

- MicrosoftSqlServer2012BiblebyAdamJorgensen,JorgeSegarra,PatrickLeblanc,Jose Chinchilla,AaronNelson(WileyIndiaPvtLtd)
- Pro SQL Server 2012 Administration, 2nd Ed by Ken Simmons, Sylvester Carstarphen (DreamtechPress)
- ExpertOracleDatabase11GAdministrationbySamR.Alapati(DreamtechPress)
- MySQLAdministrator'sBible By SheeriKCabral,KeithMurphy (JohnWiley&Sons)

MCA302 InformationSecurity

Section-A

ComputerSecurityConcepts,Threats,Attacks,andAssets,SecurityFunctionalRequirements,ASecurityArchitectureforOpenSystems,ComputerSecurityTrends,ComputerSecurityStrategy

Cryptographic Tools:ConfidentialitywithSymmetricEncryption,MessageAuthenticationandHash Functions, Public-Key Encryption, Digital Signatures and Key Management, Random and PseudorandomNumbers,PracticalApplication:EncryptionofStoredData

Section-B

UserAuthentication:Meansof Authentication,Password-BasedAuthentication,Token-Based Authentication,BiometricAuthentication,Remote UserAuthentication,SecurityIssuesfor User Authentication,PracticalApplication:AnIrisBiometricSystem

Access Control:Access Control Principles, Subjects, Objects, and Access Rights, Discretionary AccessControlExample:UNIXFileAccessControl,Role-BasedAccessControl

DatabaseSecurity:The Need forDatabase Security, Database Management Systems, Relational Databases, Database Access Control, Inference, Statistical Databases, DatabaseEncryption, Cloud Security

Section-C

MaliciousSoftware: Typesof MaliciousSoftware(Malware),Propagation–InfectedContent–Viruses, Propagation–VulnerabilityExploit–Worms,Propagation–SocialEngineering–SPAME-mail, Trojans, Payload–SystemCorruption,Payload–AttackAgent–Zombie,Bots, Payload–InformationTheft–Keyloggers,Phishing,Spyware,Payload–Stealthing–Backdoors,Rootkits

Denial-of-Service Attacks: Denial-of-Service Attacks, Flooding Attacks, Distributed Denial-of-ServiceAttacks,Application-Based BandwidthAttacks,ReflectorandAmplifierAttacks,Defenses AgainstDenial-of-ServiceAttacks,RespondingtoaDenial-of-ServiceAttack

Buffer Overflow: StackOverflows,DefendingAgainstBufferOverflows,OtherFormsofOverflow Attacks

Software Security: SoftwareSecurityIssues,HandlingProgramInput,WritingSafeProgramCode, InteractingwiththeOperatingSystemandOtherPrograms,HandlingProgramOutput

Section-D

Operating SystemSecurity:IntroductiontoOperatingSystemSecurity,SystemSecurityPlanning, OperatingSystemsHardening,ApplicationSecurity,Security Maintenance,Linux/UnixSecurity, WindowsSecurity,VirtualizationSecurity

TrustedComputingand Multilevel Security:TheBell-LaPadulaModelforComputerSecurity, Other Formal Models for Computer Security, The Concept of Trusted Systems, Application of MultilevelSecurity,TrustedComputingandthe TrustedPlatformModule,CommonCriteriafor InformationTechnologySecurityEvaluation,AssuranceandEvaluation

ITSecurity Managementand RiskAssessment: ITSecurityManagement,OrganizationalContext andSecurityPolicy,SecurityRiskAssessment,DetailedSecurityRiskAnalysis

IT SecurityControls,Plans, and Procedures:ITSecurityManagementImplementation,Security ControlsorSafeguards,ITSecurityPlan,ImplementationofControls,ImplementationFollow-up.

Textbook

W.Stallings,"ComputerSecurity:PrinciplesandPractice,"2ndEdition,PrenticeHall,ISBN:0132775069, 2011.

RecommendedBooks

M.Stamp,"InformationSecurity:PrinciplesandPractice,"2ndEdition,Wiley,ISBN:0470626399,2011.

M.E.WhitmanandH.J.Mattord,"Principlesof InformationSecurity,"4thEdition,CourseTechnology, ISBN:1111138214,2011.

M.Bishop,"ComputerSecurity:ArtandScience,"AddisonWesley,ISBN:0-201-44099-7,2002.

G.McGraw,"SoftwareSecurity:BuildingSecurityIn,"AddisonWesley,ISBN:0321356705,2006.

MCA-303SoftwareEngineering&ProjectManagement

Section-A

Software Engineering:The software problem, Evolution ofSoftware Engineering, Principles of softwareengineering,SoftwareDevelopmentvs.SoftwareEngineering.

Software Process: Software Process, Selection of appropriate process model, Software Process Models-Waterfall,Spiral,Prototyping,AgileMethodology-ScrumandXP.

Section-B

Advanced RequirementAnalysis&Design:AnalysisPrinciples,SRS,RequirementElicitation Techniques-FASTandQFD,DesignPrinciples,DesignConcepts,Data Design,ArchitecturalDesign-ArchitecturalStyles,Procedural&ObjectOrientedDesign.

Section-C

Software Project Management:The Management Spectrum, Software Project Planning and its characteristics, Types of metrics, Effort Estimation- FP, LOC, FP vs. LOC, Schedule&Cost EstimationModels-Activity Networks-PERT/CPM,COCOMO-I,COCOMO-II,RiskAssessment-ProbabilityMatrix,RiskManagement.

Software Testing: TestingFundamentals-Error/Fault/Failure,TestingPrinciples,TestCases,Testing Techniques-WhiteBox&BlackBox,UnitTesting,IntegrationTesting,SystemTesting,Verification andValidationTesting,AcceptanceTesting.

Section-D

Software QualityManagement:S/WQuality,ImportanceofS/WQuality,QualityMetrics, Quality Standards-ISO9126,ChangeControl,ChangeControlProcess.

Advanced S/WEngineering:CASETools,ReverseEngineering,Re-engineering,WebEngineering.

References:

1.Thayer,SoftwareEngineeringProjectManagement2nded,Wiley

2.R.S.Pressman,SoftwareEngineering:APractitioner'sApproach(6th ed.),McGraw-Hill,2006

3.Peters,SoftwareEngineering:AnEngineeringApproach,Wiley

4.Sommerville,Ian,SoftwareEngineering,Addison-WesleyPublishingCompany,(2006)8th ed.

5. K.K.Aggarwal andY.Singh, Software Engineering(revised 2nd ed.), NewAgeInternational Publishers,2006.

MCA-304 JAVA PROGRAMMING

Objective of the course: The objective of this course is to get insight of the subject and after completion of this course, students will be able to:

- Use the advanced features of Java Technology
- Develop good program to handle exceptions and errors in program.
- Work with collection API and develop fast programs.
- Use the java.io package in detail.
- Use the serialization concepts of java technology.
- Develop good multithreaded programs
- Work the latest JDBC technology
- Learn Java Generics and the development of Projects.

Section A

Introduction: Object Oriented Concept overview, features and applications of Java, Differences between Java and C++, structure of Java Program, understanding class path. Building Blocks: Literals, Tokens, Keywords, constants, variables & Data types, scope of variables, Operators, Expressions, Flow Control statements.

Arrays, Vectors, Type Conversion, Command Line Arguments, Review of classes and methods, Access specifiers, constructors, Inheritance, static Classes, Abstract Classes, Final Classes, Wrapper Classes: Autoboxing and Unboxing, Garbage Collection & Finalize method,

Enumerated types and annotations, Handling String and String Buffer classes, Method Overloading and Overriding, Nesting of methods and methods with varargs.

Section B

Interfaces & Packages: Interfaces and implementing multiple inheritance through interfaces, Packages, Multithreaded Programming, Synchronization.

Exception Handling: Introduction, Handling System defined Exceptions, Creating and handling user defined exception.

Managing I/O: Introduction to streams, Handling and using various Stream Classes, Random, String Tokenizer, Scanner classes .

Section C

Applet and Graphic Programming: Introduction to applets, Types of applets, Using Applet Applications, Passing Parameters to applets,

Introduction to Graphic Programming: Applying 2-D transformations on Objects, Event Handling , Layouts, Frames, Panels, Menu's, Pop up Menus, Swings, JDBC.

Section D

Advanced Programming: Servlet Programming(Servlet Life Cycle, Generic Servlet, HttpServlet, HttpServletRequest, HttpServletResponse, service method, doGET method, doPOST method, Servlet Exception), Introduction to JSP, Syntax, Semantics, Declaration and Expressions

Socket Programming: Overview, Difference between TCP and UDP Sockets, Various methods associated with TCP and UDP.

REFERENCES: -

1. Introduction to Java Programming, Comprehensive Version, Y. Daniel Liang, Pearson, 9/E
2. Java 2 The Complete Referenceb by Petric Noughton And Herbet Schildt, McGraw Hill Professional, 1999
3. Head First java by Kethy Seirra and Bert Bates, Oxford Publications.
4. Head First Sevlets and JSP, 2nd Edition by Bryan Basham, Kathy Sierra, Bert Bates, O'Rielly Media.

MCA-305A Elective System Programming

Section-A

Assemblers andMacro Processors: Languageprocessors,datastructuresforlanguageprocessing, General Design Procedure, Single pass and two pass assembler and their algorithms, assembly languagespecifications (exampleMASM).MacroInstructions, Features ofMacroFacility:Macro instructionarguments,Conditionalmacroexpansion,Macrocallswithinmacro.

Section-B

Loadersand Linkers&Editors: LoaderSchemes:Compileandgoloader,generalloaderscheme, absoluteloaders,subroutinelinkages,relocatingloaders, direct linkingloaders,Relocation,Designof AbsoluteLoader,BootstrapLoaders,DynamicLinking,MS-DOSLinker,TextEditors,Line Editor, SteamEditors,Screeneditor,Wordprocessors,Structureeditors.

Section-C

Compiler Design: Introduction to various translators, interpreters, debuggers, various phases of compiler, Introduction to Grammars and finite automata, Bootstrapping for compilers, Lexical Analysisand syntaxanalysis, Intermediate CodeGeneration, Codeoptimization techniques, Code generation,IntroductiontoYACC,Just-in-timecompilers,PlatformIndependentsystems.

Section-D

OperatingSystem: OperatingSystemsanditsfunctions,Typesofoperatingsystems:Real-timeOS, Distributed OS,MobileOS,Network OS,Bootingtechniquesandsubroutines, I/Oprogramming, IntroductiontoDeviceDrivers,USBandPlugandPlaysystems,SystemsProgramming(API's).

TEXTBOOKS:

- DonovanJ.J.,SystemsProgramming,NewYork,Mc-GrawHill,1972.
- LelandL.Beck, SystemSoftware,SanDiegoStateUniversity,PearsonEducation,1997.
- Dhamdhere,D.M.,SystemProgrammingandOperatingSystems,TataMc-GrawHill1996.

REFERENCES:

1.AhoA.V.and J.D.UllmanPrinciplesofcompilerDesignAddisonWesley/Narosa 1985.

Theory ofComputation
Elective
MCA305B

Section-A

1.Introduction,Sets,Logic,Functions,Relations,Languages,ProofsMathematicalInduction, StrongPrincipleof MathematicalInduction,RecursiveDefinitions,StructuralInduction

2.RegularLanguages&RegularExpressions,FiniteAutomata(FA),DistinguishingStringsw.r.t. Language,Union,Intersection,&ComplimentofLanguages

Section-B

3.Non-deterministicFiniteAutomata(NFA),NFAwithNull-Transitions,Kleene'sTheorem

4.ACriterionforRegularity,MinimalFiniteAutomata,PumpingLemmaforRegularLanguages

5.IntroductiontoContext-FreeGrammar(CFG),RegularGrammars,Derivation(Parse)Trees&Ambiguities,AnUnambiguousCFG forAlgebraicExpressions,Simplified
Forms& ChomskyNormalForms

Section-C

6.IntroductiontoPushDownAutomata(PDA),DeterministicPDA(DPDA),PDAcorrespondingtoa GivenCFG,CFGCorrespondingtoaGivenPDA,Parsing

7.ThePumpingLemmaforCFG,Intersection&ComplementofCFGs,DecisionProblems InvolvingCFGs

Section-D

8.TuringMachine(TM)Definition&Examples,ComputingaPartialFunctionwithaTM

9.RecursiveEnumerable& RecursiveLanguages,EnumeratingaLanguage,Context-Sensitive Languages&ChomskyHierarchy

Reference Book:
"IntroductiontoLanguagesandtheTheoryofComputation", JohnC.Martin,TataMcGraw-Hill, (2003),3rdEdition,ISBN:007049939X

SuggestedAdditionalReading:
1."ElementsoftheTheoryofComputation",HarryLewis&ChristosH.Papadimitriou,IEEE(PHI), 2ndEdition,ISBN-978-81-203-2233-2.

2."TheoryofComputation", MichaelSipser,",Cengage Learning(2007), ISBN-13:978-81-315-0513-7

3."IntroductiontoAutomataTheory,Languages,andComputation",Hopcroft,Motwani&Ullman, PearsonEducation,3rdEdition,(2008),ISBN:978-81-317-2047-9

MCA305 C Elective

EMBEDDED SYSTEMS

SectionA

IntroductiontoEmbeddedSystems: Overviewofembeddedsystems,features,requirements andapplicationsof embeddedsystems,recenttrendsin theembeddedsystemdesign,common architecturesfortheESdesign,embeddedsoftwaredesignissues,introductionto development andtestingtools.

SectionB

Embedded System Architecture: Basics of 8-bit 40 Pin PIC microcontroller 16F877A, Memory Organization, Special Function Registers, GPIO, Timer Comparator and A/D Convertor,BusArchitecture,AddressingModes,TimersandCounters

SectionC

Assembly languageprogramming:Memory-MappedI/O,Interrupthandling,PIC16F877A InstructionSet,AssemblerDirectives,Programmingof PICMicrocontrollers

SectionD

Applications ofEmbeddedSystems: Industrial and control applications, networking and telecomapplications,DigitalSignalProcessingandmultimediaapplications,Applicationsin theareaof consumerappliances.

References:

1. “EmbeddedSystemsDesign”bySteveHeath
2. "Real-TimeSystems"byJaneWSLiu,PrenticeHall
3. “DesignwithPICMicrocontrollers”byJohnB.PeatmanPearsonEducation,1997
4. PIC16F877ADataSheet

MCA-306(Software LabVI–DatabaseAdministration)

Implementationof variousDBAroles/techniquesstudiedinMCA-301,like:

- Practicalimplementationofvariousindustryleadingdatabasepackages.
- Import/Exportdatabetweenvariousdatabasesandflatfiles.
- ImplementationDatabasereplication
- Backup/Restorestrategiesimplementation
- UserandRolescreationandmanagement

MCA-307 S/WLab-VII [JAVAProgramming]

LearningObjectives:

- Tounderstand Basic Programming Constructs and the concepts of Object Oriented ProgrammingandditsApplicationsPractically.
- Multithreading.
- InterfacesandPackagehandling.
- AppletandSwingsProgramming.
- DatabaseConnectivity.
- JavaServletsandJavaServerPages
- Strutsimplementation.
- IntroductiontoHibernate.

Semester4th

MCA401Mobile ApplicationDevelopment

Section-A

Characteristicsofmobileapplications.ArchitectureandworkingofAndroid,iOSandWindowsphone 8operating system. User-interface designformobile applications andmanaging application data. Integrating cloudservices, networking, OS and hardware into mobile-applications. Addressing enterpriserequirementsinmobileapplications: performance,scalability,modifiability,availability andsecurity.

Section-B

MobileSoftwareEngineering(DesignPrinciples,Development, Testingmethodologies formobile applications,Publishing,Deployment,maintenance,andmanagement).

IntroductiontoAndroidDevelopment Environment,What IsAndroid?Advantagesand FutureofAndroid,Frameworks,ToolsandAndroid SDK.InstallingJava,AndroidStudio,SDKManager Componentsand updatingitsplatforms,AVDManager,GenymotionPlugin:FastestVirtualdevices, UnderstandingJavaSEandtheDalvikVirtualMachine.

TheDirectoryStructure ofanAndroid Project, Common Default Resources Folders, TheValues Folder,LeveragingAndroidXML.

Section-C

Application Development in Android: App Components (Intents and Intent Filters, activities, services,ContentProviders,AppWidgets,Processesand Threads),Appresources,AppManifestand User interface,ActionBar,ContentSharing,Multi-PlatformDesigns,Animationandgraphics, computation,MediaandCamera,Locationand sensors,Connectivity,Text and Input,DataStorage, AdministrationandWebApps.

Section-D

IntroductiontoiOSapplicationdevelopment:OverviewofiOS,iOSDevelopmentEnvironment,,iOSLayers ,basicofSwift,BuildinganapplicationforIOS.

Windows phoneEnvironment:Overviewofwindowsphoneanditsplatform,Buildingwindows phoneapplications.

References/ TextBooks

1.ProfessionalMobileApplicationDevelopment,JEFFMCWHERTER,SCOTTGOWELL,Wiley.
2AndroidStudioApplicationDevelopment,BelenCruz,Zapata,PacktPublishing
2ProfessionalAndroid4ApplicationDevelopment,RetoMeier,WroxPublication
3BeginningiPhoneDevelopmentwithSwift,DavidMark,ApressPublication

WebResources
•SafariTextbooksOnline:http://library.ohio-state.edu/search/y?SEARCH=Safari
•AndroidDeveloperSite:http://developer.android.com/index.html
•StackOverflow:http://www.stackoverflow.com

MCA402E-CommerceandWebApplicationDevelopment

Section–A

IntroductiontoElectronicCommerce,Potentialbenefits& limitationsofE-Commerce,Traditional Commercevs.E-CommercevsM-Commerce,DifferentE-CommerceModels(B2B,B2C,C2C,P2P), E-Commerceapplications,SocialNetworks,Auctions& Portals,LegalandEthicalissuesinE-Commerce.IntroductiontoElectronicDataInterchange,TypesofEDI,BenefitsofEDI, OverviewofElectronicPayment system,Typesof Electronicpaymentschemes(Creditcards,Debit cards,Smartcards,Internetbanking),IssuesinElectronicpaymentsystems

Section–B

WebBasedMarketingand Communications:OnlineAdvertising,E-MailMarketing,OnlineCatalogs, SocialMarketingandTargetedMarketing,TechniquesandStrategies

WWWconcepts,Client/ServerComputing,WebServersand Clients,WebBrowsers,Protocolsand Ports, IPAddress, Domains &DNS,URL,ASystematic approachtoWebsite creation, Creating interactive and dynamic webpages, Factors in E-Commerce Website design, Web and Database integration,WebsiteOptimizationstrategies

E-Commercesecurity,threats,managingsecurityissuesthroughinternetsecurity protocolsand standards,andFirewall.

Section–C

HTML5:IntroductiontoHTML5,NewfeaturesinHTML5,API,HTML5documents,HTML5tags: text formatting,text styles, Lists(orderedandunordered), addinggraphics toHTML5page,creating tables,linkingdocuments,imagesas hyperlinks,forms,frames.CSS3:Introduction,consistentweb designingusingCSS3,IntroductiontoBootstrap-forms,grids,tables,Images

Section–D

Java Script:Introduction:features,advantages,operators,datatypes,statements,controlstatements. writingjava scriptintoHTML5. documents,forms,functions,objects,clientsideinteractivewebpage design,input validation,eventhandling,databaseconnectivity.DOM:document,elements,attributes, event.

REFERENCES:-

- E-Commerce-Fundamentalsandapplicationsbychan,Wiley.
- WebTechnologiesBlackBook(HTML5.0,9789351192510)by Kogent,Wiley.
- E-CommerceEssentialsbyKennethLaudonandCarolTraver–PearsonPublication

- FrontiersofElectronicCommercebyRaviKalakota,AndrewB.Whinston-AddisonWesley Publication
- E-Commerce,FundamentalsandApplicationsbyHenryChan,RaymondLee,TharamDillon andElizabethChang- WileyIndiaPublication
- WebEnabledCommercialApplicationDevelopmentUsingHTML,,JavaScript, DHTMLandPHPbyIvanBayrossBPBPublication

MCA-403 InteractiveComputerGraphics

SECTION A

Reviewof ComputerGraphics,Applicationsofcomputergraphics.

Introductionto Graphicdeviceslikelight pens,Graphictablets,GraphicCards,DataGlove, Digitizers,GraphsandtypesofGraphs.

Cathode-Ray tube,RasterScandisplays,RandomScandisplays,Architectureof aRasterand Random Graphics System withdisplayprocessor, Colorgeneratingtechniques (shadowmask, beampenetration), RasterScanSystems,RandomScanSystems,GraphicsMonitorsand Workstations,ColorModels(RGBandCMY),colorlookupTable.

SECTION B

InputandOutputprimitives,Processandneedof ScanConversion,Scanconversionalgorithmsfor line,circleandellipse,effectofscanconversion,Bresenham'salgorithmsfor lineandcirclealong withtheirderivations,midpointcirclealgorithmwithderivation, areafillingtechniques,floodfill techniques,charactergenerationtechniques(liketypography,vectorandbitmap).

2-DimensionalGraphics:Cartesianand HomogeneousCo-ordinateSystem,Geometric transformations(translation,Scaling, Rotation, Reflection,Shearing),Compositetransformations, affinetransformation,Twodimensionalviewingtransformationand windowingandclipping(line, polygon and text). Concave andConvex Polygon, Cohen Sutherland line clipping and its algorithm,SutherlandHodgemanpolygonclipping.

SECTIONC

3-dimensionalGraphics:Geometrictransformations(translation,Scaling,Rotation, Reflection, Shearing),Compositetransformations,Paralleland PerspectiveProjections.Beziercurvesand its properties,B-Splinecurves.Fractals,Classificationof fractals.

SECTION D

Hidden line and surface elimination algorithms: Z-buffer, Painters algorithm, scan-line, sub-division, Shading and Reflection: Diffuse reflection, Specular reflection, refracted light, Halftoning, Dithering techniques. Surface RenderingMethods: Constant Intensity method, GouraudShading,PhongShading(MashBandeffect).Morphingofobjects

Note:GraphicsProgrammingusingC/C++withintroductiontoOpenGL.

References:

1.D.HearnandM.P.Baker,“ComputerGraphics”,PHINewDelhi;ThirdEdition.

2.J.D.Foley,A.V.Dam,S.K.Feiner,J.F.Hughes,.R.LPhillips,”ComputerGraphicsPrinciples&Practices, SecondEdition”,PearsonEducation,2007.

3.R.A.PlastockandG.Kalley,“ComputerGraphics”,McGrawHill,1986.

4.F.S.Hill:ComputerGraphicsusingOpenGL-SecondEdition,PearsonEducation-2003.

MCA-404 ADVANCEDOPERATINGSYSTEM

SectionA

Multi-Processorand DistributedOperatingSystem: Introduction,Architecture,Organization, Resourcesharing,LoadBalancing,AvailabilityandFaultTolerance,Designand DevelopmentChallenges,Inter-processCommunication,DistributedApplications– LogicalClock,Mutual Exclusion,DistributedFileSystem.

SectionB

Real Timeand EmbeddedOperatingSystems: Introduction,HardwareElements,Structure-InterruptDriven,Nanokernel,Microkerneland Monolithickernelbasedmodels.Scheduling-Periodic,AperiodicandSporadicTasks,IntroductiontoEnergyAwareCPUScheduling

SectionC

Clusterand GridComputing:IntroductiontoClusterComputingandMOSIXOS,Introduction totheGrid,GridArchitecture,ComputingPlatforms:Operating Systemsand NetworkInterfaces, GridMonitoringandScheduling,PerformanceAnalysis,CaseStudies

SectionD

CloudComputing: IntroductiontoCloud,CloudBuildingBlocks,CloudasIaaS,PaaSandSaaS, Hardware&SoftwareVirtualization,Virtualizationof OS–HypervisorKVM,SAN& NASback-endconcepts.

MobileComputing:Introduction,DesignPrincipals,Structure,PlatformandFeaturesofMobile OperatingSystems(Android,IOS,WindowsMobileOS)

References:

- SibsankarHaldar,AlexA.Arvind,“OperatingSystems”,PearsonEducationInc.
- TanenbaumandVanSteen,“DistributedSystems:PrinciplesandParadigms”, Pearson,2007.
- M.L. Liu,“DistributedComputing:PrinciplesandApplications”,Addison-Wesley, Pearson
- MaozhenLi,MarkBaker,“TheGrid-CoreTechnologies”,JohnWiley&Sons,2005

1.InstallingJava,Eclipse,andAndroid:AndroidStudioandGenymotion

2.Developing2Androidbasedapplications

3.Creatingorderedandun-orderedlistsinHTML5.

4.CreatingtablesinHTML5

5.Usingimagesashyperlinks.

6.CreatingformsandframesinHTML5.

7.DesigningwebpageusingCSS3.

8.Programusingifcontrolstatementin JavaScript.

9.ProgramusingloopcontrolstatementinJavaScript.

10.Webpageacceptinginputfromuserandhandlingdatabaseconnectivity.

11.WebpageDemonstratinginputvalidationandeventhandling.

Software LabIX(InteractiveComputerGraphics)

MCA-406

Thevariousalgorithmswillbeimplementedusing C/C++orOpenGL

FifthSemester

MCA-501

Artificial Intelligence

Section-A

Introduction:Intelligence,Foundationsofartificialintelligence(AI).HistoryofAI;TuringTest,The underlyingassumption,andAI techniques,LevelofModel.

Problems,ProblemSpaceandSearch:definingtheproblemasastatespacesearch,Production System,ProblemCharacteristics,ProductionSystemanditscharacteristics.WaterJugproblemandits spacesearch.

Section-B

Un-informedSearch: DepthFirstSearch,BreadthFirstSearchitsadvantagesanddisadvantages.

InformedSearchStrategies:HeuristicfunctionsBestfirstsearch,A*algorithm, DepthfirstSearch, Breadthfirstsearch,BestFirstSearch,advantagesanddisadvantagesofinformedsearchtechniques. Iterativedeepening,Gameplaying- Perfectdecisiongame,imperfectdecisiongame,evaluation function,alpha-betapruning.

Section-C

KnowledgeRepresentation:CharacteristicsandknowledgerepresentationIssues:representationand mapping.Reasoning: PropositionalLogic,predicatelogic(firstorderlogic)FOPL,logicalreasoning, forwardchaining,backwardchaining;representingsimplefactsinlogic,representinginstanceandIS Arelationships,resolutionprinciplewithexamples.ClausalformRepresentation,Inference.

Section-D

Uncertainty:Basicprobability,Bayesrule,Beliefnetworks,Defaultreasoning,Fuzzysetsandfuzzy logic;Decisionmaking-Utilitytheory,utilityfunctions,Decisiontheoreticexpertsystems.

Weak-slotand-fillerstructures: Frames,Strongslotandfillerstructures:Conceptualdependency, scripts.

Communication:Communicationamongagents,formalgrammar,parsing,grammar.Natural Languageprocessinganditsproblems,discourseandpragmaticprocessing.

Suggested/Readings &Books

1.StuartRussellandPeterNorvig.ArtificialIntelligence–AModernApproach,PearsonEducation Press,2001.

2.KevinKnight,ElaineRich,B.Nair,ArtificialIntelligence,McGrawHill,2008.

3. GeorgeF.Luger,ArtificialIntelligence,PearsonEducation,2001.

4. NilsJ.Nilsson,ArtificialIntelligence:ANewSynthesis,MorganKauffman,2002.

MCA-502 Design & Analysis of Algorithms

Section-A

DataStructures:QuickrevisionofDataStructures-stacks,queues,trees,heaps,setsandgraphs.Trees: BinarySearchtrees,OptimalBSTrees,AVLTrees,RBTrees,Hashing

Section-B

Algorithms:Whatisanalgorithm?Analyzingalgorithms,orderarithmetic,Timeandspace complexityofanalgorithm,comparingtheperformanceofdifferentalgorithmsforthesameproblem. Differentordersofgrowth.Asymptoticnotation.Polynomialvs.Exponentialrunningtime.Principles ofAlgorithmDesign.

Section-C

BasicAlgorithmDesignTechniques:Divide-and-conquer,Greedy,Randomization,backtracking,and dynamicprogramming.Exampleproblemsandalgorithmsillustratingtheuseofthesetechniques.

Sortingandsearching:Insertionandselectionsort,Binarysearchinanorderedarray.Sorting algorithmssuchasMergesort,Quicksort,Heapsort,RadixSort,andBubblesortwithanalysisof theirrunningtimes.Lowerboundonsorting.

Section-D

GraphsandNP-completeness:Graphtraversal:breadth-firstsearch(BFS)anddepth-firstsearch (DFS).ApplicationsofBFSandDFS.Shortestpathsingraphs:Dijkstraalgorithm. Definitionofclass NP,P,NP-hardandNP-completeproblems.

SuggestedReadings/Books:

1.FundamentalsofComputersAlgorithmsbyEllisHorowitz,S.Sahni,andS.Rajasekaran, UniversityPress.

2.TheDesignandAnalysisofComputerAlgorithmsbyA.V.Aho,J.E.Hopcroft,andJ.D.Ullman, PearsonEducationIndia.

3.AlgorithmDesign byJ.KleinbergandE.Tardos,PearsonEducationIndia .

4.IntroductiontoAlgorithmsbyThomasH.Cormen,CharlesE.Leiserson,RonaldL.Rivest,Clifford Stein,PHI.

MCA-503 WebTechnologies

SECTION- A

XML:Introductionto XML,XMLBasics,XMLSyntaxandEditors,documents,Elements,Attributes. Creating: XMLdocuments,DocumentTypeDefinitions(DTD),XMLSchemas(XSD),XML Namespaces,XMLDocumentObjectModel,XSLT.UseofXSLTwithXML.

SECTION- B

Introduction toAjax,UseofAjaxinWebsite. IntroductiontojQuery, Overview, retrieving page content,manipulatingpagecontent,workingwithevents.

SECTION-C

PHP:Server-sidewebscripting,InstallingPHP,AddingPHPtoHTML,SyntaxandVariables, Passinginformationbetweenpages,Strings,ArraysandArrayFunctions,Numbers,BasicPHPerrors/ problems.

Advanced PHPandMySQL:PHP/MySQLFunctions,Displayingqueriesintables,BuildingForms fromqueries,StringandRegularExpressions,Sessions,CookiesandHTTP,TypeandType Conversions,E-Mail

SECTION- D

IntroductiontoWebServices,UseofWebServices,TypesofWebServices,

IntroductiontoContentManagementSystemCMS(Types,Usages,Benefits).

TEXTBOOKS:

1. WebTechnologies:HTML,JavaScript,PHP,Java,JSP,XMLandAJAX blackbook (9789350045930),Wiley.
2. ProfessionalXML,WroxPublications.
3. WebServicesEssentials:DistributedApplicationswithXML-RPC,SOAP,
3. Web ServicesEssentials:DistributedApplicationswithXML-RPC,SOAP,UDDI&WSDLBy EthanCerami,O'Reilly

MCA-504 Object OrientedAnalysisandDesignusingUML

SectionA

ObjectorientationandDevelopment,OOBenefits,Abstraction,OOModeling,

The ThreeModels:ClassModeling(ObjectsandClasses,Relationships,Generalizationand Inheritance,Association,Aggregation,Constraints,Packages),StateModeling (Events,States, TransitionsandConditions,Stateand Behavior,Concurrency)andInteractionModeling(Use casemodels,SequenceandActivity)

SectionB

Systemand Process,SDLC,Creationof SRSdocument:RequirementSpecification, DocumentationandSDLCModels.Domainand ApplicationAnalysis(Class,Stateand InteractionModels),

SystemDesign(Subsystems,GlobalResources,Conditions,Priorities)

Using designpatterns(Abstraction-Occurrence,GeneralHierarchy,Player-Role,Singleton, Observer,Delegation,Adapterand ProxyPatterns),ClassDesign(Usecases,algorithms, refactoring,designoptimization,inheritanceadjustment)

SectionC

UMLDiagram:Usecasediagram,Classdiagram,Objectdiagrams,Aggregationactivitieson realobjects(Aggregation,Generalizationrelations,Associationand multiplicity),Activity diagram(Activity andstatediagram), Interaction Diagram(Sequence diagram, Collaboration diagram,Componentdiagram.)

SectionD

OO Methodologies(StructuredAnalysis,StructuredDesign(SA/SD),JacksonStructured Development(JSD),InformationModelingNotations),OMT as SEMethodology,OOImpact, OO Style (Reusability, Extensibility, Robustness, Programming-in-the-large), User centric design and usability principles, Reverse Engineering, Difficulties and risks in use-case modelingandUIdesign,Systemtestingandmaintenance.Useof opensourcetoolsforUML DesignsuchasPlantUML,ArgoUML.

TEXTBOOKS:

- FrederickEddy,JamesRumbaugh,MichaelBlaha,WillliamPremerlani,William Lorensen:Object-OrientedModelingandDesign,PearsonEducation.
- JamesRumbaugh,MichaelR.Blaha:Object-OrientedModelingandDesignwith UML,PearsonEducation.
- TimothyC.Lethbridge,RobertLaganiere:ObjectOrientedSoftwareEngineering, PracticalSoftwareDevelopmentusingUMLandJava,TataMcGraw-Hilledition.
- Hans-ErikEriksson,MagnusPenker,BrianLyons,DavidFado:UML2Toolkit, WILEY-DreamtechIndiaPvt.Ltd.

REFERENCEBOOKS:

- MeilirPage-Jones:FundamentalsofObjectOrientedDesigninUML,Pearson Education.
- PascalRoques:ModelingSoftwareSystemsUsingUML2,WILEY-Dreamtech IndiaPvt.Ltd.
- AtulKahate:ObjectOrientedAnalysis&Design,TheMcGraw-HillCompanies.
- MarkPriestley:PracticalObject-OrientedDesignwithUML,TATAMcGrawHill.
- Appling UMLandPatterns:AnintroductiontoObject–OrientedAnalysisand Designand
- UnifiedProcess,CraigLarman,PearsonEducation.

MCA–505 Software LabXI (WebTechnologies)

ThesoftwarelabwillbebaseduponthecourseWebTechnologies(MCA-503).

MCA–506 Software LabXII(Object Oriented Analysis&Designwith UML)

ThesoftwarelabwillbebasedonUML.

Semester6th

MCA-601 DataWarehousingandDataMining

SectionA

Review of Data Warehouse: Need fordata warehouse, Bigdata, Data Pre-Processing, Threetier architecture;MDDMand itsschemas,IntroductiontoSpatialDatawarehouse,ArchitectureofSpatial Systems, Spatial: Objects, data types, reference systems; Topological Relationships, Conceptual Modelsfor SpatialData,ImplementationModelsforSpatialData,SpatialLevels,Hierarchiesand MeasuresSpatialFactRelationships.

SectionB

Introductionto temporalDatawarehouse:GeneralConcepts,TemporalityData Types,Synchronization andRelationships,TemporalExtensionofthe MultiDimensionalModel,TemporalSupportforLevels, Temporal Hierarchies, Fact Relationships, Measures, Conceptual Models for Temporal Data Warehouses:LogicalRepresentationandTemporalGranularity

SectionC

IntroductiontoDataMiningfunctionalities,Mining differentkindofdata,Pattern/ContextbasedData Mining, Bayesian Classification: Bayes theorem, Bayesian belief networks Naive Bayesian classification, Introduction to classification by Back propagation and its algorithm, Other classification methods: k-Nearest Neighbor, case based reasoning, Genetic algorithms, rough set approach,Fuzzy setapproach

SectionD

Introductiontoprediction:linearandmultipleregression,Clustering:typesof datainclusteranalysis: interval scaled variables, Binary variables, Nominal, ordinal, and Ratio-scaled variables; Major ClusteringMethods: PartitioningMethods:K-Meanand K-Mediods,Hierarichalmethods: Agglomerative,Densitybasedmethods:DBSCAN

References:

1. DataMining:ConceptsandTechniquesByJ.HanandM.Kamber
   PublisherMorganKaufmannPublishers
2. AdvancedDatawarehouseDesign(fromconventionaltospatialandtemporalapplications)by
   ElzbietaMalinowskiandEstebanZimányi
   PublisherSpringer
3. ModernDataWarehousing,MiningandVisualizationByGeorgeM Marakas,
   PublisherPearson

MCA602–CloudComputing

Section-A

OverviewofCloudComputing:Introduction,Definitionofcloud,Definitionofcloud,characteristics ofcloud,Why useclouds,Howcloudsarechanging,Drivingfactorstowardscloud,Comparinggrid withcloudandothercomputingsystems,workloadpatternsforthecloud,"BigData",ITasaservice.

Section-B

Cloud computing concepts:Conceptsofcloudcomputing,CloudcomputingleveragestheInternet, Positioningcloudto a gridinfrastructure,Elasticityandscalability,Virtualization,Characteristicsof virtualization, Benefits ofvirtualization, Virtualization incloudcomputing, Hypervisors, Multitenancy,Typesof tenancy,Applicationprogramminginterfaces(API),Billingand meteringof services , Economies of scale, Management, tooling, and automation in cloud computing, Management:DesktopsintheCloud,Security.

Cloudservicedelivery:Cloudservice,Cloudservicemodelarchitectures,Infrastructureasaservice (IaaS)architecture,Infrastructureasa service(IaaS)details,Platformasaservice(PaaS)architecture, Platform asaservice (PaaS) details, Platform asaservice (PaaS) ,Examples ofPaaS software, Softwareasaservice(SaaS)architecture,Softwareasaservice(SaaS)details,Examplesof SaaS applications, Trade-off incost toinstall versus ,Common cloud management platform reference architecture:Architectureoverviewdiagram,Commoncloudmanagementplatform.

Section-C

Cloud deploymentscenarios:Clouddeploymentmodels,Publicclouds,Hybridclouds,Community, Virtualprivateclouds,Verticalandspecialpurpose,Migrationpathsfor cloud,Selectioncriteriafor clouddeployment.

Security inCloudcomputing:Cloudsecurityreferencemodel,securityintegration,securityrisks, Internalsecuritybreaches,Datacorruptionor loss,Useraccountandservicehijacking,Stepstoreduce cloudsecuritybreaches,enhancingcloudsecurity,identitymanagement

Section-D

CloudComputingplatforms:IBM SmartCloud, Amazon Web Services, Google Cloud platform, WindowsAzureplatform,A comparisonof CloudComputingPlatforms,CommonbuildingBlocks. Integrationofcloudcomputingwithmobileandadhocnetworktechnologies.

SuggestedReadings/Books

1. Raj Kumar Buyya, James Broberg, AndrezeiM.Goscinski, Cloud Computing: Principles and paradigms,2011,Wiley.
2. MichaelMiller,CloudComputing,2008.
3.JudithHurwitz,RobinBllor,MarciaKaufman,FernHalper,CloudComputingfordummies,2009.
4. AnthonyT.Velte,TobyJ.VelteandRobertElsenpeter,CloudComputing:ApracticalApproach, McGrawHill,2010.
5.BarrieSosinsky,CloudComputingBible,Wiley,2011.
6.BorkoFurht,ArmandoEscalante(Editors),HandbookofCloudComputing,Springer,2010.

MCA-603Advanced ComputerArchitecture

Course Objectives: Tounderstandandanalyzethefunctionality,connectivityandperformanceof variousprocessorsandmemorytypes.

Section-A

FundamentalsofProcessors:Instruction setarchitecture; singlecycleprocessors, hardwired and micro-codedFSM processors;pipelinedprocessors,multi-coreprocessors;resolvingstructural,data, controlandname hazards;analyzingprocessorperformance.

Section-B

FundamentalsofMemories:Memorytechnology;direct-mapped,associativecache;write-through andwrite-backcaches;single-cycle,FSM,pipe-linedcache;analyzingmemoryperformance.

Section-C

Advanced Processors:Superscalar execution, out-of-order execution, register renaming, memory disambiguation,dynamic instructionscheduling,branchprediction,speculativeexecution;multi-threaded,VLIWand SIMDprocessors.

Section-D

Advanced Memories: Non-blocking cache memories; memory protection, translation and virtualization;memorysynchronization,consistencyandcoherence.

RecommendedBooks:

1. ComputerArchitecture:AQuantitativeApproach,by J.L HennessyandD.APatterson.
2. DigitalDesignandComputerArchitecture,byD.MHarrisandS.LHarris.

MCA-604Software Testing&Quality Management

Section-A

Software Testing Fundamentals- Terminology, error, fault and failures, objectives, principles, Purpose of testing, Debugging, Theoretical and practical limitations of testing, The problem of infeasiblepaths,Testability,Relationshipof testingwithotheractivities,Testinglevels,Unittesting, Integrationtesting,Systemtesting,Acceptancetesting.

Testing Techniquesand Strategies-Staticanddynamictesting,Softwaretechnicalreviews,Testing techniques andtheirapplicability, Functional testingandanalysis, Structural testingandanalysis, Hybridapproaches,Transactionflowanalysis,Stressanalysis,Failureanalysis,Concurrencyanalysis, Performanceanalysis.

Section-B

FlowgraphsandPath Testing: Pathtestingbasics,Pathpredicates,Applicationofpathtesting.

Data Flow Testing: Basics ofdata flow testing, Data flow model, Data flow testing strategies, Applications.

Software Testing and RegularExpression: Pathproducts,Pathsums,Loops,Reductionprocedure, Applications,Approximatenumberofpaths,Themeanprocessingtimeofany routine,Regular expressionandFlow-anomalydetection

Section-C

SoftwareQuality: SoftwareQualityMetrics,Standards,Certificationand assessment,Quality management standards, Quality standards with emphasis on ISO approach, Capability Maturity Models-CMMand CMMI,TQMModels,The SPICEproject,ISO/IEC15504,SixSigmaConceptfor SoftwareQuality.

Quality Planning:Inputs,Toolsandtechniques,Outputs

Section-D

Quality Assurance:Inputs, Qualitymanagement plan, Results of quality control measurements, Operationaldefinitions,Qualityplanningtoolsandtechniques,Qualityaudits,Qualityimprovements

Quality Control:Inputs,Toolsandtechniques:Inspection,Controlcharts,Paretodiagrams,Statistical sampling, Flowcharting, Trend analysis, Outputs: Quality improvements, Acceptance decisions, Rework,Completedchecklist,Processadjustments.

RecommendedBooks:

1.Jeff Tian, Software Quality Engineering: Testing, Quality Assurance, and Quantifiable Improvement,Wiley.

2. BorisB.Bezier,SoftwareTestingTechniques,WileyDreamtechPublication(2004).

3. WilliamPerry,EffectiveMethodsforSoftwareTesting,JohnWiley&Sons,Inc.(2006).

4. GlenfordJ.Myers,TheArtofSoftwareTesting,WileyIndiaPvt.Ltd2ndedition (2006).

MCA–605Software LabXIII(Software Testing&QualityManagement)

Developingapplicationsto automatebasispathtesting,Boundaryvalueanalysis,Dataflowtesting, Branch andstatement coverage, etc. Exposure to automated testing tools such as Rational test manager,Selennium,Loadrunnerorany othersimilartools.