MAHATMAGANDHIUNIVERSITYKOTTAYAM

BACHELOROFDEGREEPROGRAMMEIN
COMPUTERSCIENCE

SCHEME&SYLLABUS

(Effectivefrom2009Admissionsonwards)

BACHELOROFCOMPUTERSCIENCE

1.AbouttheCourse

Technologyisdefinedastheapplicationsof BasicScience.Thepasttworevolutions,industrialandelectronic,havetransformedthesocietyfromagriculturaltoindustrialandthentoelectronic.Theelectronicallybasedtechnologiesfocusedininformationgathering,processinganddistribution.Theuseofthistechnologyinallsectorsgavethebirthto ComputerIndustryanditsunprecedentedgrowthlaunchedanotherrevolutioninCommunication.

Information,thebasicrawmaterialfortheDecisionSupportSystem,canbederivedfromprocessingofhugedatabaserelatedwithdifferentsectors.Systematicstorageandmanagementwithadequatesecurityareessentialfordataretrievalandprocessingtogenerateinformation.Theinformationtechnologyplaysanimportantroleinallareas.Butthemaindrawbackisthetechnophobiaofthepeopletoadaptwiththenewtechnologies.Thismaybeduetolackofawarenessofthemeritsandadvantagesofnewtechnologies.Soouryouthshavetobeequippedwithallkindsofknowledgetoolstoworkwithcomputerscomfortablywhicharebasicrequirementstoprovidehumanresourcetotheindustry.

Theradicalchangesintechnologies,bothhardwareaswellassoftware,andtheireverincreasingadaptationtonewerareasofapplication,demandfrequentupdationoftheacademiccurriculumsothatthestudentscanrisetotheexpectationoftheIndustry.Thesyllabusrevisioncommitteehasconsideredallthesefactorsthoroughlybeforeventuringintotherevisionexercise.

TherevisedsyllabusforBScComputerScienceProgrammeprovidesastrongfoundationtopursuepostgraduationprogrammeincomputerscience/applications.Theknowledgeacquiredbythestudentsmayalsoequipthemtomeettheindustrialneed,andgetplaced.

TheBScComputerScienceprogrammeoftheMGUniversityfollowsthechoicebasedcreditsemestersystemasenvisagedbytheUniversityGrantsCommissionandtheHigherEducationCouncilofKerala.TheProgrammeshallbecompletedinsixsemesters.Eachsemesterisaminimumof18instructionalweeks,comprising90workingdayswithcontinuousinternalevaluationandUniversityexaminationattheendofeachsemester.

2.CourseObjectives

TheBScComputerScienceProgrammeisdesignedwiththefollowingspecificobjectives.

(a)Toattractyoungmindstothepotentiallyrich&employablefieldofcomputerScience.

(b)Tobeafoundationgraduateprogrammewhichwillactasafeedercourseforhigherstudiesintheareaof ComputerScience/Applications.

(c)Todevelopskillsinsoftwaredevelopmentandhardwaremaintenancesoastoenableth egraduatestotakeupself-employmentinIndian&globalmarket.

(d)ToTrain&Equipthestudentstomeettherequirementoftheindustrialstandards.

3.Admission

TheeligibilityforadmissiontoBScComputerScienceDegreeundertheMahatmaGandhi Universityisapassin Pre-degree,PlusTwoorequivalentexaminationsinsciencestreamwithMathematics/Computer Scienceasacompulsorysubject.

4.Registration

Allthecandidatesadmittedforthecourseshouldregisterwiththe M.GUniversityalongwith theoriginalcertificateofthequalifyingexaminationswithin3monthsfromthedateofcommen cementoftheIsemestercourse.

5.DurationofCourse

Thecourseshallnormallyextendoveraperiodofthreeacademicyearsconsistingofsixsem esters.

6.RequirementofAttendanceandProgress

Acandidateshallnormallybepermittedtoregisterandappearfortheendsemesteruniversit yexaminationsif

(a)He/Shesecurednotlessthangrade Cforattendanceineachcourseofstudyinthesemester ,and

(b)His/Herprogressissatisfactoryintheinternalassessmentineachofthesubjects.

7.ExaminationSystem

7.1.Theevaluationofeachcourseshallcontaintwoparts

(i)InternalorIn-SemesterAssessment(ISA)

(ii)ExternalorEnd-SemesterAssessment(ESA)

Theinternal:externalexaminations ratioshallbe1:3

7.2..TheInternalandExternalexaminationsshallbeevaluatedusingDirectGradings ystembasedon5-pointscaleasgivenbelow.

LetterGrade	Performance	Gradepoint(G)	GradeRange
A	Excellent	4	3.5to4.00
B	VeryGood	3	2.5to3.49
C	Good	2	1.5to2.49

D	Average	1	0.5to1.49
E	Poor	0	0.00to0.49

7.3.Theoverallgradeforaprogrammeforcertificationshallbebasedon CGPAwitha7-pointscalegivenbelow.

CGPA	**Grade**
3.80to4.00	A+
3.50to3.79	A
3.00to3.49	B+
2.50to2.99	B
2.00to2.49	C+
1.50to1.99	C
1.00to1.49	D

AseparateminimumofDGradeforinternalandexternalarerequiredforapassforacourse.

Forapassinaprogrammeaseparateminimumof GradeDisrequiredforallthecourses.and

mustscoreaminimumCGPAof2.00oranoverallgradeofC+andabove

7.4.Internalevaluation:istobedonebycontinuousassessmentsonthefollowingcomponents.

7.4.1.ComponentsoftheInternalevaluationandtheirweightsareasbelow.

(i)Theory

Component	**Weight**
Attendance	1
Assignment	1
Seminar	1
Twotestpapers	2

(ii)Practical****

(iii)Project****

(iv)On-the-Jobtraining****

(v)Socialserviceactivity****

(vi)Co-curricularactivity****

7.4..2.Attendance:.

%ageofAttendance	Grade
>90%	A
Between85and90	B
Between80and85	C
Between75and80	D
<75	E

7.4.3Assignments:Best□twoassignmentsareconsideredpercourse

7.4.4.Seminar/Viva:Thestudenthastotakeaminimumof1seminarpercourse.

7.4.5.Classtest.□Aminimumof2classtestsaretobeattended.□Thegradesof best2testaretobetaken□

7.4.6.Theevaluationofallcomponentsaretobepublishedandaretobeacknowledgedbythe□□□□candidate.□Alldocumentsofinternalassessmentsaretobekeptinthecollegefor2yearsandshallbemadeavailableforverificationbytheuniversity.□Theresponsibilityofevaluatingtheinternalassessmentisvestedontheteacher(s)whoteachthecourse.

□□□□□□□Incaseacandidatefailstosecuretheminimumgradedininternalassessment,he/shemaysecureitbyrepeatingthecoursealtogetherinaregularclassortotakethecoursewithafacultymemberassignedbytheHeadoftheDepartment.Butsuchimprovementininternalinthesamepapercannotbeattemptedmorethanonce.

□Thesupplementaryexaminationswillbeconductedalongwiththenextregularsemesterexaminations.

8.PATTERNOFQUESTIONS

□□□□□□□□□Questionsshallbesettoassessknowledgeacquired,standardapplicationofknowledge,applicationofknowledgeinnewsituations,criticalevaluationofknowledgeandtheabilitytosynthesizeknowledge.□Thequestionsettershallensurethatquestionscoveringallskillsareset.□He/Sheshallalsosubmitadetailedschemeofevaluationalongwiththequestionpaper.

□□□□□□□□Aquestionpapershallbeajudiciousmixofobjectivetype,shortanswertype,shortessaytype/problemsolvingtypeandlongessaytypequestions.

□□□□□□□□Weight:Differenttypesofquestionsshallbegivendifferentweightstoquantifytheirrangeasfollows:

********	**Typeofquestions**	**Weight**	**Numberofquestionstobeanswered**
1	Abunchof4objectivetypequestions	1	4bunches(nochoice)
2	Shortanswertypequestions	1	5outof8
3	Shortessay/problemsolving*typequestions	2	4outof6
4	Essaytypequestions	4	2outof3

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9.RequirementforthecompletionofProgramme

*AcandidatehastocompletetheProgrammewithinaperiodoffiveyearsaftertheregistration.

c)Acandidatewhodoesnotcompletetheconcernedsemesterwiththeminimumattendancerequirementprescribedwillnotbepermittedtoattendthenextsemester.

1.

2.

3.

4.

5.

PROPOSEDSCHEMEFORBScComputerSciencePROGRAMME REVISEDCURRICULUM-2009

6.

7. **ISemester**

8.

9. 10. Course 11. No.	12. 13. 14. Course	15. No.ofhoursperweek		16. Durn.of Examinhours	17. Credits
		18. ect	19. ab.		
20. BCS101	21. English-I(Common)	22.	23.	24. 3	25. 4
26. BCS102	27. MathematicsI	29.	30.	31. 3	32. 4

	28. (Complementary)				
33. BCS103	34. BasicElectronicsandComputerFundamentals 35. (Core)	36.	37.	38. 3	39. 4
40. BCS104	41. MethodologyofProgrammingandProgramminginC(Core)	42.	43.	44. 3	45. 3
46. BCS105	47. DigitalElectronics(Complementary)	48.	49.	50. 3	51. 4
52. BCS106	53. SoftwareLab►I(Core)	54.	55.	56. 3	57. 2
58.	59. ►►►

154. BCS304	155. Datacommunication(Core)	156. 4	157. -	158. 3	159. 4
160. BCS305	161. ComputerOrganisation(Core)	162. 4	163. -	164. 3	165. 4
166. BCS306	167. SoftwareLab►III(Oracle) 168. (Core)	169. -	170. 5	171. 3	172. 2
173.	174. ►►►►►►►►►►►►►►►Total	175. 20	176. 5	177.	178. 21

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186.

187. **IVSemester**

188.

189. 190. Course 191. No.	192. 193. 194. Course	195. No.ofhoursperweek		196. DurnofExaminhours	197. Credits
		198. Lect	199. Lab.		
200. BCS401	201. VisualProgramming(Core)	202. 4	203. -	204. 3	205. 4
206. BCS402	207. Microprocessor&AssemblyLanguageProgramming(Core)	208. 4	209. -	210. 3	211. 4
212. BCS403	213. ComputerNetwork&Internet(Core)	214. 4	215. -	216. 3	217. 4
218. BCS404	219. OperatingSystem(Core)	220. 4	221. -	222. 3	223. 4
224. BCS405	225. AssemblyLanguageProgramming 226. (Core)	227. -	228. 9	229. 3	230. 2
231. BCS406	232. SoftwareLab►IV(VB)(Core)	233. -	234. 4	235. 3	236. 2
237.	238. ►►►►►►►►►►►►►►►Total	239. 6	240. 9	241.	242. 20

243.
244.
245.

246. **VSemester**

247.

248. 249. Course	251. 252. 253. Course	254. No.ofhoursperweek		255. Durn.ofExaminhours	256. Credits
		257. L	258. L		

250. No.		ect	ab.		
259. BCS501	260. ComputerAidedOptimisationTechniques(core)	261. 4	262. -	263. 3	264. 4
265. BCS502	266. SystemAnalysis&Design(core)	267. 4	268. -	269. 3	270. 4
271. BCS503	272. JavaProgramming(core)	273. 4	274. -	275. 3	276. 3
277. BCS504	278. LinuxandPHP(core)	279. 4	280. -	281. 3	282. 3
283. BCS505	284. OpenCourse(core)	285. 4	286. -	287. 3	288. 4
289. BCS506	290. Linuxprogrammingandprojectinjava(core)	291. -	292. 5	293. 3	294. 2
295.	296. ●●●●●●●●●●●●●●●●●●●●●●Total	297. 20	298. 5	299.	300. 20

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302.

303.

304. **VISemester**

305.

306. 307. Course 308. No.	309. 310. 311. Course	312. No.ofhoursperweek		313. Durn.ofExaminhours	314. Credits
		315. Lect	316. Lab.		
317. BCS601	318. ParallelProcessing(core)	319. 5	320. -	321. 3	322. 4
323. BCS602	324. ComputerGraphicsandMultimedia(core)	325. 5	326. -	327. 3	328. 4
329. BCS603	330. Elective(core)	331. 5	332. -	333. 3	334. 4
335. BCS604	336. Seminar	337. -	338. 3	339. 3	340. 2
341. BCS605	342. Project(core)	343.	344. 7	345. -	346. 4
347.	348. ●●●●●●●●●●●●●●●●●●●●●●Total	349. 15	350. 10	351.	352. 18

353.

354. **Elective:**

355. BCS603(A):DataMining

356. BCS603(B):ClientServerComputing

357. BCS603(C):Imageprocessing

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360. **□□□

UserDefinedFunctions:Functiondeclaration,definition&scope,recursion,Arraysandfunctions,callbyvalue,callbyreference,StorageClasses:automatic,external(global),static&registers.

Module5(20hrs)

Structures: DefinitionofStructures,declaration,structurepassingtofunctions,arrayofstructures,arrayswithinstructures,unions,typedefstatements.
Pointers: PointerDefinition,pointerarithmetic,array&pointerrelationship,pointertoarray,pointertostructure,dynamicmemoryallocation.

Bookofstudy:
ProgramminginANSIC4E,E.BalaGuruswamy,TMH
ProgramminginC,ByronSGottfried,Shaum sOutlineseries.TMH
References:
ComputerFundamentalsByPKSinha&PritiSinhaFourthEdition.
B.KernighanandD.Ritchie,TheANSICProgrammingLanguage,PH

BCS105:DigitalElectronics(Complementary)

Module1(8hrs)
Numbersystems,OperationsandCodes:-
Decimalnumbers BinaryNumbers Decimaltobinaryconversion Binaryarithmetic 1sand2scomplementofbinarynumbers Signednumbers Arithmeticoperations withsignednumbers hexadecimalnumbers octalnumbers binarycodeddecimal digitalcodes errordetectionandcorrectioncodes.
Logicgates:-
Theinverter AND OR NAND NOR ExclusiveOR ExclusiveNORGates.

Module2(10hrs)
Booleanalgebraandlogicsimplification:-LawsandrulesofBooleanalgebra De-Morgan stheorems simplificationoflogicexpressionsusingBooleanalgebra SOPandPOSexpressions theKarnaughmap Karnaughmapminimizations.
CombinationalLogic:-
Implementationof alogiccircuitfromaBooleanexpression Implementationofalogiccircuitfromatruthtable Minimizingalogiccircuit TheUniversalpropertyofNAND andNOR gates

Module3(12hrs)
LogicFunctions:-
Adders ParallelBinaryAdders Comparators Decoders Encoders CodeConverters Multiplexers De-multiplexers ParityGenerators/Checkers.

Module4(20hrs)
FlipFlops:-Latches◆Edgetriggeredflipflops◆Master-SlaveFlipFlops--Flip-FlopOperatingCharacteristics◆Flip-FlopApplications.Counters:-AsynchronousCounterOperation◆SynchronousCounterOperation◆Up/DownSynchronousCounters◆DesignofSynchronousCounters◆CascadedCounters◆CounterDecoding◆CounterApplications.

Module5(14hrs)
ShiftRegisters:-
SerialIn/SerialOutShiftRegisters◆SerialIn/ParallelOutShiftRegisters◆ParallelIn/SerialOutShiftRegisters◆ParallelIn/ParallelOutRegisters◆BidirectionalShiftRegisters◆ShiftRegisterCounters◆ShiftRegisterApplications-SystemInterfacing-ADC-DAC.

Bookofstudy:

DigitalFundamentals◆Eighthedition◆FloydandJain◆Pearsoneducation
References
Digitallogicandcomputerdesign◆MorrisManoPHL
Digitalcomputerfundamentals◆-BarteeT

BCS106◆◆SoftwareLabI(Core)

[*Therewillbetwoquestions:thefirstfromExercises3to5andthesecondfromExercises6to10.Exercises1and2willbeincludedintheviva*]

1.FamiliarizationofComputerSystemandinstallation:◆Demonstrationofvariousunitsof Computersystem,handlingofdevices,demoonhardwareunits,Loginprocess,BootingProcess,softwareinstallation,driverinstallation,printerinstallationetc.◆◆◆

2.PracticingOperatingSystemCommands:MS-DOSinternal&Externalcommands(dir,copy,del,ren,copycon,date,time,chkdsk,mkdir,cd,rmdir,EDITetc).MS-WINDOWS**►**usingstartmenu,desktop,taskbar,wordpad,notepad,filemanagement-creation,copy,delete,movingoffilesindirectories,selectingandexecutingaprogram-Demonstrationofediting,compilingandexecutingaCprogramusingaCcompiler.**►►►

7.UserDefinedFunctions:Programsusingreturntypefunctions,voidtypefunctions,exampleprogramusingrecursivefunctions,arraysortingprogramusingfunctionwithcallbyreference,functiontocopyonestringintoanother.
8.Programusingstructures:arrayofstructures,programusingstructurecontainingarrays andarrayofstructures.Ranklistpreparation******************
9.Simpleprogramusingpointers*****

SEMESTER2

BCS201**ENGLISHII(Common)**
(Syllabusas*approvedbyBoardofStudiesofEnglish(UG)*

BCS202**MATHEMATICSII(Complementary)**
(Syllabusas*approvedbyBoardofStudiesofMathematics(UG)*

BCS203:Data*Structures(Core)

Module1(8hrs)
ProgrammingConcepts:Introduction,BasicTerminology,DataStructureOperations;
Algorithm:Definition,AlgorithmAnalysis,Complexity,AsymptoticNotation,****
Recursion.*****

Module2(10hrs)
Array: Introduction,LinearArrays,RepresentationofLinearArraysinMemory,traversing LinearArrays,InsertionandDeletioninLinearArrays;MultidimensionalArrays;Matrices, SparseMatrices.**String**:BasicTerminology,Representation,StringOperations,PatternMatchingAlgorithms.***

Module3(12hrs)
Stack: Introduction,ArrayRepresentationandBasicOperations;ImplementationofStacks. ApplicationofStacks-EvaluatingArithmeticExpressionusingStacks-InfixtoPostfixNotation.-EvaluatingaPostfixNotation-
Queue:Introduction,ImplementationofQueue,PriorityQueue,Dequeue

Module4(14hrs)*****

LinkedList:Introduction,RepresentationofLinkedList,Traversing,Searchingalist,InsertionandDeletioninaLinkedList;HeaderLinkedList,DoublyandCircularLinkedList;GarbageCollection.

Module5(12hrs)
NonLinearDataStructuresandAlgorithms
Trees: Introduction,BinaryTrees,Representation,TraversinganditsAlgorithms,ThreadedTrees,BinarySearchTrees;HeapTrees,Huffman sAlgorithm,ApplicationofTrees.
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Module6(8hrs)
Sorting: Bubblesort,Insertionsort,Selectionsort,Heapsort,Quicksort,Mergesort;Comparisonofsortingalgorithms.**Searching:**LinearSearch,BinarySearch;Comparisonofsearchingalgorithms.

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Bookofstudy:
Schaum sOutlineSeries:TheoryandProblemsofDataStructures-SeymourLipschutz
References
Introductiontodatastructureswithapplication-Jean-PaulTremblay&G.Sorenson
Datastructuresusingcand C++, Tanenbaum

<u>BCS204:PrinciplesofElectricalCommunication(Complementary)</u>

Module1(6hrs)
Signals:-IntroductionToSignals-AnalogAndDigital-PeriodicAndAPeriodic.DifferentTypes-GraphicalRepresentation.FrequencySpectrum-Bandwidth-SimpleCommunicationModel.CommunicationBlocks.

Module2(10hrs)
Media:DifferentTypes-GuidedAndUnguided-PhysicalDescriptionAndCharacteristicsOfTwistedPairCables,CoaxialCablesAndOFCs-IntroductionToSignalNoise-TransmissionImpairments-ChannelCapacity-SNR-WirelessTransmission-SatelliteCommunication-IRTransmission.

Module3(22hrs)
ModulationandDemodulation:-Modulation-IntroductionAM,FM,PM-DSB,SSB.VestigialSidebandModulation-AnalysisOfAM,FM,PMWaves-GenerationofAMWaves,FilterSystem-PhaseShiftMethod-ThirdMethod-

GenerationOfFM-FMMethods-DirectMethod-AFC-IndirectMethod.Demodulators-AMAndFM-AMReceivers-FMReceivers-ComparisonOfAMAndFM.

Module4(16hrs)
DigitalCommunication:-Introduction-Sampling-Quantization-Companding-NyquistCriteria-PulseModulation-DigitalCommunications:-PCM,DPCM,DM,ADM,ConceptOfFDMAndTDM.

Module5(10hrs)
DigitalModulationTechniques:-ASK,FSK,PSK,BPSK,QPSK,BFSK.

Bookofstudy:

ElectronicCommunicationSystems,KennedyAndDavis
PrinciplesofCommunicationSystems,TaubAndSchilling

References:

Data&ComputerCommunications,WilliamStallings
DataCommunicationAndNetworking,BehrouzAForouzan

BCS205:ObjectOrientedProgramminginC++(Core)

Module1(16hrs)
Introductiontoobjectorientedconcepts,featuresofobjectorientedprogramming,C++programmingbasics,Datatypes,operators,precedenceofoperators,controlflow,functions,arraysandstrings,operationsonarrays,stringmanipulations.
Classesandobjects,constructors,destructors,objectsasfunctionarguments,inlinefunctions,friendfunctions,friendclasses,arrayofobjects.

Module2(10hrs)
Overloading,operatoroverloading,overloadingunaryoperators,overloadingbinaryoperators,functionoverloading,dataconversion

Module3(10hrs)
Inheritance,Baseclassandderivedclass,formsofinheritance,publicinheritance,privateinheritance,constructorsinderivedclass.

Module4(14hrs)
Virtualfunctions,pointers,memorymanagement,newanddelete,pointerswithinaclass,pointerstoobjects,arrayofpointerstoobjects,pointertoobjectmembers,pointertoderivedclassobjects,pointerstopointers,polymorphism,virtualfunction,purevirtualfunction,abstractclasses,latebinding,
earlybinding,thethispointer

Module5(14hrs)
Filesandstreams,streams,predefinedconsolestreams,stringI/O,objectI/O,files,filemodes,filepointers,fileinput/output
commandlinearguments,templates,exceptionhandling.

Bookofstudy
E.Balaguruswamy,*ObjectOrientedProgramminginC++*

References

1. SchaumsOutlineseries,*ProgramminginC++*
2. Venugopal,Rajkumar,Ravishankar,*MasteringC++*,McGrawHill
3. Stroustrup,Bjarne,*TheC++ProgrammingLanguage*,AddisonWesley
4. RobertLafore,*ObjectOrientedProgramminginC++*,McGrawHill

<u>BCS206:SoftwareLabII(C++)(Core)</u>

SimpleProgramsusingOOPconcepts8hrs.

Inlineandfriendfunctions6hrs

Constructorsanddestructors6hrs

Arrayofobjects6hrs

Overloading6hrs

Inheritance
6 hrs

Pointersandmemorymanagement
8hrs

Virtualfunctions
6hrs

Files Commandlinearguments
6hrs

Templates andExceptionhandling
6hrs

Total
64hrs

SEMESTER3

BCS301:►►Probabilityandstatistics(►Complementary)
(Syllabusas►approvedbyBoardofStudiesofStatistics(UG)►

BCS302:►►SYSTEMSOFTWARE(Core)

Module1(8Hrs)
►Systemsoftware-Generalconcepts,Assemblers-Designofassembler,MacrosandMacroprocessor,Macrodefinitions&Instructions,Featuresofmacrofacility,Nestedmacroscalls.

Module2(8Hrs)
►Loading,Linking&Relocating-Loading&LinkingSchemes-RelocatablityofPrograms,ConceptsofBinders,Linking►Loaders,Overlays,DynamicBinders,Designofanabsoluteloader.

Module3(16Hrs)
►Phaseofcompiler,AspectsofCompilation-Datatypes,DataStructure,Scoperules,Controlstructure,CompilationProcess-Analysisphase,Synthesisphase,Programminglanguagegrammars►Derivations,Reductionandsystemtrees.

Module4(16Hrs)

Classificationofgrammars,Ambiguityinprogramspecification,LexicalScanner,Parsing-Topdown,Bottomup,Tabledrivenparsing.

Module5(16hrs)
&#65533;Compilationofexpressions,Intermediatecodeformsforexpressions,Compilationofcontrolstructures,Codeoptimization-LocalandGlobal.

Bookofstudy:
&#65533;SystemProgramming**&#65533;**&Operatingsystems-DMDhamdhere**&#65533;**(TataMcGrawHill)

References:
SystemProgramming**&#65533;**-JohnJDonovan(TataMcGrawHill)
DesignofCompilers**&#65533;**Aho&Ullman

BCS303:DatabaseManagementSystems(Core)

Module1(10hrs)
Introduction:CharacteristicsoftheDatabaseapproach**&#65533;**Problemswithfilesystemdatamanagement**&#65533;**Datamodels,Schemasandinstances**&#65533;**DBMSarchitectures-Dataindependences**&#65533;**DatabaselanguagesandInterfaces**&#65533;**DDL**&#65533;**DML,DCL**&#65533;**DatabaseAdministrator**&#65533;**Duties.
&#65533;Entity**&#65533;**Relationshipmodel-Entitysets,attributesandkeys-Relationships,Relationshiptypesandstructuralconstraints**&#65533;**Weakandstrongentity-EnhancedEntityRelationship(EER)andobjectmodeling.-specializationandgeneralization.

Module2(16hrs)

&#65533;PhysicalDataorganization-Hashedfiles-Indexedfiles-B-Trees,sequentialOrganizationfiles.
TherelationalDatamodelconcepts-Relationalmodelconstraints-TheRelationalalgebra-Tuplerelationalcalculus,Domainrelational**&#65533;**calculus-SQL

Module3(10hrs)
Databasedesign-Functionaldependencies-Basicdefinitions-Trivialandnontrivial**&#65533;**dependencies-Closureofasetof**&#65533;**dependencies-closureofasetof**&#65533;**attributes-Irreduciblesetofdependencies-Non**&#65533;**lossdecompositionand**&#65533;**functionaldependenciesFirst,SecondandThirdNormalforms-Boyce**&#65533;**Codd**&#65533;**Normal**&#65533;&#65533;**forms.

Module4(13hrs)

Transactionprocessing-Desirablepropertiesof►transactions-SerializabilityofschedulesConcurrencycontroltechniques-Lockingtechniques-TimestampOrderingandmultiversion►techniques-Databaserecoverytechniques-Recoverytechniquesbasedon►deferredupdatesandimmediateupdate,shadowpaging-DatabaseSecurityand►Authorization-Accesscontrolbasedongranting/Revokingofprivileges.

Module5(15hrs)
Distributeddatabases-Centralizedsystems-Motivationofdistributeddatabases-concepts-Typesofdistributedsystems-DistributedQueryprocessing-Commitprotocolsfordistributeddatabases.
IntroductiontoObjectorienteddatabases-Features-Objectidentity-Objectcontainment-Inheritance-
OODBMSandORDBMS►DatabasesandInternet►IntroductiontoDataMiningandDatawarehousing.

Bookofstudy:
A.Silberschatz,H.FKorth,andSSudarsan,►Databasesystemconcepts►,4/e,TataMcGrawHill,2002

References

1)ElmasriandNavathe,►FundmentalsofDatabaseSystems►,3/e,PearsonEducation,2003
2)PeterRob,Carlos►Coronel,►Databasesystems-DesignImplementationandManagement►,Thomson7/e.
3)C.JDate,►AnIntroductionToDatabaseSystems►,7/e,PearsonEducation,2003
4)VKJain►DBMS►,WileyDreamTechIndiaPLtdNDelhi.
5)BipinC.Desai.►AnIntroductiontoDatabaseSystems►,GalgotiaPublications,2001

<u>BCS304:DataCommunications(Core)</u>

Module1(10hrs)
CommunicationDevices:-DigitalDataTransmission-DTE-DCE-Interface-OtherInterfaceStandards-Modem-
DifferentTypes►Hub►Repeaters►Switches►Routers►Comparison►NIC-MultilayerDevices.

Module2(12hrs)

ErrorDetectionandCorrection:-Errors□Types□Detection-RedundancyCheck□Vertical□Horizontal□Cyclic□Checksum□Correction-HummingCode-Burst.
WirelessDevicesandWiredDevices:-CablesforCommunication-CAT5□UTP-BNC,OpticTransmissionandReception.DifferentTransmissionModes.
□

Module3(14hrs)
DataLinkControl-LineDiscipline-ENQ/ACK-Poll/Select-FlowControl-StopandWait-SlidingWindow-ErrorControl□ARQ-DifferentTypes.DataLinkProtocols-AsynchronousandSynchronousProtocols□Frames-CharacterOriented-BitOriented□HDLC-LinkAccessProcedures.

Module4(15hrs)□□□□□
Switching□Packet□Circuit-Message.Approaches.FrameRelay:-Introduction-Layers-CongestionControl-TrafficControl-OtherFeatures.

Module5(13hrs)
UpperOSILayers□Session-SessionandTransportInteraction□Synchronization□SPDU□Presentation□Translation-EncryptionandDecryptions□Authentication-DataCompression□Application□MHS□FTAM□VT□DS-CMIP

Bookofstudy:

DataCommunicationandNetworkingByBehrouzA.Forouzan.

References:
Data&ComputerCommunications□,WilliamStallings
ElectronicCommunicationSystems□,KennedyandDavis
PrinciplesofCommunicationSystems,TaubandSchilling

<u>BCS305:ComputerOrganisation(Core)</u>
Module1(12hrs)
Functionalunits,Basicoperationalconcepts,Busstructures,numbers,arithmeticoperationsandcharacters,memorylocations,andaddress,memoryoperations,instructionexecutionandstraightlinesequencing,branching,controlcodes,addressingmodes
□Asperchapter1ofBookofstudy
Module2(18hrs)

Thememorysystem:basicconcepts,semiconductorRammemories,internalorganizationof memorychips,memorysystemconsiderations.ROM,PROM,EPROM,EEPROM,Flashm emory,Speed,sizeandcost.Cachememories,performanceconsiderations,interleaving

****Asperchapter5oftextbook

Module3(14hrs)
Arithmeticunit:additionandsubtractionofsignednumbers,addition/subtractionlogicunit, designoffastadders,multiplicationofpositivenumbers,signedoperandmultiplication,Boo thalgorithm.Fastmultiplication,bitpairrecordingofmultiplication,carrysaveadditionofsu mmands,integerdivision
****Asperchapter6ofBookofstudy

Module4(18hrs)
Processingunit:Fundamentalconcepts,registertransfers,performinganarithmeticorlogico perations,fetchingawordinmemory,executionofacompleteinstruction,branchinstruction, hardwiredcontrol,acompleteprocessor,microprogrammedcontrol.

****Asperchapter7ofBookofstudy

Module5(10hrs)
Input/Outputorganization:accessingI/Odevices,Interrupts,enablinganddisablinginterru pts,handlingmultipledevices,Directmemoryaccess,busarbitration
****Asperchapter4oftextbook

Bookofstudy:
ComputerOrganisation-HamacherVranesicZaky(Fifthedition)
****
McGrawHill

References

1. StructuredComputerOrganisation-Andrews****Tannenbaum
2. ComputerOrganisationandArchitecture-WilliamStallings

****
****<u>**BCS306*:*SoftwareLabIII*(RDBMS*ORACLE)(Core)**</u>

Basics:ConnectingtoRDBMSServer-userlogin****invokeSQLplus.

SQLplus:Namingatable-assigningstorage****datatypes-Displayformats-creatingtables-Creatingtablesfrom****othertables-CreatingSynonyms-DescribingTable

Structures-Commands-Changingtablestructures-Alteringanddropping-tables-Manipulatingdataintables-Insertingdataintotables-UsingUPDATE-to-change data-DCLcommands-GRANT,REVOKE,COMMIT,ROLLBACK-AUTOCOMMITDeletingrows(**20hours**)

Addingcolumns-savingandretrievingSQLcommands-EditingSQLcommands AndSQL*pluscommands(**8hours**)

Query:Queryingsingletables-Projection,selection-Ordering,groupingresults-accessingrecordsfrommultipletables-Subqueries-Correlatedsubqueries-Connecting Queries.(**14hours**)

Views:Defining-aview-grantingviewaccesstoothers-Queryingviews-creatingsynonyms-DefiningmultipleviewwithJOINandwithoutJOIN-Inserting,deleting andupdatingdatathroughviews-droppingviews(**10hours**)

PL/SQL:simpleprogramusingcontrolstructures-Cursors-Exceptions-Triggers-Procedures-Functions(**12hours**)

BookofStudy:
1)UnderstandingOracle-JamesTperry&JosephGLateer
2)Sql,Pl/sql-ProgrammingLanguageofOracle-Ivan-Bayross-2nd revisededition2002-BPB--Publication.
3)Oracleabeginnersguide-MichelAbbey&MichaelJCorey
4)Oracle9i-Thecompletereference-Loney&Koch-TMHPublication-2002

SEMESTER4

BCS401:-VISUALPROGRAMMING(Core)

Module1(6hrs)
-IntroductiontoWindows,GUIconcept,ConceptofEvent-drivenprogramming,TheVisualBasicIDE(5.50),TypesofVisualBasicProjects,VisualBasicEditions,TheVisualBasic ProjectLifecycle,-ProjectFiles.

Module2(22hrs)

ProgrammingElements⬩Datatypes-Constants-Variables-operators⬩userdefineddatatypes-LibraryFunctions-ProgramComments-Arrays⬩DynamicArrays-Strings-Enumerations.LogicStatements⬩ConditionalConstructs(if/Then,SelectCase),Iteration (DoLoop,ForLoop,DoEvents-Exit,StopandEnd.FunctionsandSubroutines-Arguments⬩ByRefvs.ByValParameters-OptionalArguments-ModuleBasics-EventProcedures-ClassModules.TypesofErrors,Errorhandling,CreatingErrorHandlers-Debugging⬩DebuggingTools.

Module3(14hrs)
Forms-Controls,Controlarrays,menus,menueditor,Graphicsprogramming,Simpleanimation SDI,MDIApplications
DatabaseConcepts-Visualdatamanager,TheADODataControl-DataGridControl⬩DBListandDBComboControls⬩DataviewWindow-DataformWizard⬩DataEnvironmentDesigner.

Module4(10hrs)
ReportusingCrystalReports,dataenvironment⬩Reportsusingreports-Errorhandling⬩CreatingActiveXcontrols,ActiveEXE,ActiveXDLL.

Module5(12hrs)
IntroductiontotheWeb-Internet&WebProtocols-HTML,StructureofHTMLdocuments,Attributes,BasicHTMLTags,FormsandControls, VBScripts,DHTML,DHTMLobjectmodel,ASP,ASPobjectmodel.

⬩Bookofstudy:

1. FrancescoBalena;ProgrammingMSVB6.0,WPPublishersandDistributors⬩(p)Ltd SouthAsianEdition.
2. EvangelosPetroutsos;⬩Mastering⬩Visual⬩Basic6,BPBPublishersFirstEditions,⬩Reprinted2005.
3. Deitel&Detiel,T.R.Nieto;VB6HowtoProgram,PearsonEducation.
4. PeterNorton;GuidetoVisualBasic6,Tech-Media.
5. BobReselman,RichardPeasley;UsingVB6,PHI.

<u>BCS402:⬩MicroprocessorsandAssemblyLanguageProgramming (Core)</u>

Module1(10hrs)

Microprocessorarchitectureanditsoperations◆microprocessorinitiatedoperationsand8085busorganization,internaldataoperations,8085registers,externallyinitiatedoperations.
Memory◆memorymap,memoryandinstructions,peripheralmappedI/O.
8085microprocessoranditsarchitecture.

Module2(16hrs)
8086Internalarchitecture.Basic8086microcomputersystem◆systemoverview,◆8086bus,Readmachinecycle,Writemachinecycle.
Assemblylanguageprogramming◆programdevelopmentsteps,8086instructions◆datatransferinstructions,arithmeticinstructions,bitmanipulationinstructions,stringinstructions,programexecution,Constructingthemachinecodesfor8086instructions.
Implementingstandardprogramin8086-unconditionaljumpinstructions,conditionflags,◆conditionaljumpinstructions,If-then,If-thenelse,andmultipleif-then-else,while-do,repeat-until,◆loopinstructions,instructiontiminganddelayloops.

Module3(14hrs)
Strings,ProceduresandMacros◆8086stringinstructions,writingandusingprocedures,CALLandRETinstructions,stack,usingPUSHandPOPtosaveregistercontents,passingparameters,reentrantandrecursiveprocedures,writingandusingmacros.

Module4(14hrs)
8086interrupts◆programexamples,interruptTypes,8254software◆programmableTIMER/COUNTER◆basic8253and8254operations,8255A,8259AProrityinterruptcontroller.
DirectMemoryAccessdatatransfer◆circuitconnectionsandoperationsoftheIntel8257DMAcontroller,◆DMAtransfertimingdiagram.

Module5(10hrs)
Intel80286microprocessor◆architecture,signalsandsystemconnections,Realaddressmodeoperation,protectedmodeoperation.Intel8038632-bitmicroprocessor◆◆architecture,pinsandsignals.◆Introductionto80486microprocessor.IntroductiontoRISCmachines.

Bookofstudy:
MicroprocessorsandInterfacing,ProgrammingandHardware,DouglasV-Hall.TataMcGraw-Hill.
Architecture,◆◆ProgrammingandInterfacing-BarryB.Brey◆◆
Prentice◆HallIndia.◆◆◆◆◆◆◆◆◆◆◆◆◆◆◆

References:

Microprocessor8086programming&interfacing,A.nagoorKani.RBApublications.
TheIntelMicroprocessors8086/8088,80186/80188,80286,80386,80486,Pentium,andPentiumProprocessor

BCS403:ComputerNetworking&Internet(Core)

Module1(12hrs)

Overview Networkingterminology networktypes-TransmissionMedia ControlSchemes LayeredArchitecture OSIReferenceModel TCP/IPReferenceModel TelephoneNetworks LeasedLines PSTN ISDN BroadbandCommunications ISPs.

Module2(12hrs)

GeographicalClassificationsofNetwork Ethernet LANInterconnectionTopologies-FastEthernets VLANs Protocols FrameRelay MAN IPAddresses RoutingAlgorithms InternetRouting IPv4/6 NAT.

Module3(14hrs)

TCP/IP UDP WirelessTCP DNS ElectronicMail FTP TFTP SNMP etc.

Module4(12hrs)

WirelessNetworks BlueTooth CellularRadioNetworks WirelessLANs CableTelevisionNetworks SatelliteTelevisionNetworks InteractiveServices.

Module5(14hrs)

Internet WebServers Applications URLs-WWW-HTTP&MIME HTML&XML Protocols Languages Scripts RTSP WAP Securities BasicTechniques DataEncryption Authentication NetworkandWebSecurity Privacy.

Bookofstudy:

ComputerNetworking&Internet(FredHalsall,LinganaGaudaKulkarni).

References:

1. ComputerNetworks(AndrewSTanenbaum)
2. DataandComputerCommunications(WilliamStallings)
3. DatacommunicationandNetworking(BehrouzAForouzan)

<u>BCS404:OPERATINGSYSTEMS(Core)</u>

Module1(7Hrs)
Definition-Functions-OSasResourceManager,Types Structure-ConceptofBatchProcessing,multi-programming,multi-userSystemsandReal-timesystem,POST Bootstrapping Kernel

Module2(22Hrs)
Processmanagement:processconcept,processscheduling,operationsonprocesses,cooperatingprocesses,interprocesscommunication,communicationinclientserversystems,threads,overview,multithreadingmodels,CPUscheduling,schedulingcriteria,CPUscheduling algorithms,processsynchronization,critical-sectionproblem-semaphores,deadlocks,prevention,avoidanceanddetection.

Module3(16Hrs)
StorageManagement:memorymanagement,contiguousmemoryallocation,paging,segmentation,segmentationwithpaging,virtualmemory,demandpaging,pagereplacement,allocationofframes,thrashing.

Module4(14Hrs)
File-SystemInterface:fileconcept,accessmethods,directorystructure,filesystemstructure,filesystemimplementation,allocationmethods,freespacemanagement,fileprotectionandsecurity-protectionconcepts,securityproblem,userauthentication,programthreats,systemthreats.

Module5(5Hrs)
DeviceManagement:typesofdevices-dedicated,shared-devicescheduling&virtualdevices-spooling,conceptofdevicedrivers.

Bookofstudy:

1.OperatingSystemConcepts►►AbrahamSilberschatz,PeterBaerGalvin,GregGagne►►►

SEMESTER5

BCS501:COMPUTERAIDEDOPTIMIZATIONTECHNIQUES

Module1(10hrs)
LinearProgramming:Mathematicalformulation,Graphicalmethodsofsolution,generalproperties,Simplexmethod,Duality,dualsimplex,post-optimalityanalysis.

Module2(12hrs)
TransportationandAssignmentProblems:Transportationandtransshipmentproblems,assignmentproblems,sampleprograms.

Module3(14hrs)
Networkanalysis,CPMandPERT:Shorterrouteproblem,maximalflowproblem,projectscheduling,criticalpathcalculations,PERTcalculations,Sampleprograms.

Module4(14hrs)
Inventorymodels:Deterministicinventorymodels,infinitedeliveryratewithnobackorders,infinitedeliveryratewithbackorders,finitedeliveryratewithbackorders.Introductiontoprobabilisticinventorymodels,sampleprograms.

Module5(14hrs)
Sequencingmodels:Processingofnjobsthroughm2machines,njobsthrough3machines,2jobsthroughmmachines,maintenancecrewscheduling.

Bookofstudy:
OperationsResearchKantiSwarup,P.K.Gupta,ManMohan(SultanChand&Sons)

References:

1. OperationsResearch:AnIntroductionHamdyA.Taha(PrenticeHallofIndia)
2. IntroductiontoOperationsResearch:ComputerorientedAlgorithmic(McGrawHill1976)
3. QuantitativeTechniquesinManagementVolmaN.D(T.M.II1990)
4. OperationsResearchformanagementShenoyG.VSrivastava&Sharma(WileyEasternIIedition)

BCS502:SystemAnalysisAndDesign

Module1(10hrs)
Informationsystemsconcepts,Businessinformationsystems;Describingthebusinessorganization►organizationchart,organizationfunctionlist;informationsystemlevels►-operational,lower,middle,topmanagement;thesystemdevelopmentlifecycleconcepts;hardwareandsoftwareendproducts.**Lifecycleactivities**-lifecycleflowchart,task,managementreview,baselinespecifications,roleofsystemanalyst.

Module2(14hrs)
Basictoolofsystemanalysis:►identificationcodes►definition,needforcodes,codeplan,codedictionary,commontypeofcodes,formsdesign►basicpartsofform,styleandtypesofform,principlesofformdesign.**Toolsforstructureanalysisanddesign**:Typesofbasicchart s,decisiontables,decisiontrees,structuredEnglish,dataflowdiagram,datadictionary,systemflowcharts,flowchartingsymbols,informationorientedflowcharts,processorientedflowcharts,HIPOcharts.

Module3(12hrs)
Studyphase:Studyphaseactivities,informationservicerequest,initialinvestigation,factfindingtechniques,factanalysistechniques,stepsinfeasibilityanalysis,studyphasereport.

Module4(10hrs)
Designphase:Designphaseactivities,structuredesign,inputdesign-inputdata,inputmediaanddevices,outputdesign,designphasereport.

Module5(10hrs)
Developmentphase: Developmentphaseactivities,bottomupandtopdowncomputerprogramdevelopment,training-programmer,operator,usertrainings;convertion;changeoverplan;PERT;stepsincomputerprogramdevelopment;structuredprogramming;developmentphasereport.

Module6(8hrs)
Operationphase:Operationphaseactivities;changeovercrisis;changeoveractivities;routineoperations;security;performanceevaluation.

Bookofstudy:
ElementsOf►SystemAnalysis►MarvinGore&JohnStubbe,GalgotiaBookSource.

References:
SystemAnalysisAndDesign►EliasMAwad,GalgotiaBookSource.
SoftwareEngineeringConcepts►RichardFairley,TataMcGrawPublication.

BCS503:PROGRAMMINGINJAVA

ModuleI(12Hours)
BriefHistoryofJava,FeatureofJava,JDK,DataTypes,Operators,ControlStructuresinJAVA,Arrays,TheJAVAClass,Constructor,Finalizers,ClassesinsideClasses.

ModuleII(10Hours)

Inheritance&Interface,DerivingClasses,MethodOverriding,MethodOverloading,AccessModifiers,AbstractClassandMethod,Interfaces,Packages.

ModuleIII(12Hrs)

ExceptionHandling,TheTry-CatchStatement,CatchingmorethanoneException,TheFinallyClause,WhentouseExceptions.Threads:Introduction,CreatingTreadsinApplications,MethodsinThreadClass.

ModuleIV(14Hrs)

JavaI/OPackages,JavaInputStreamClasses,JavaOutput,FileClass.Graphic&Sound:AWTandSwing,GraphicMethods,Fonts,UserinterfacecomponentswithSwing,LoadingandViewingImages,LoadingandPlayingSound,AWT&EventHandling,Layout.

ModuleV(16Hours)

Networks&LayerofNetworks,IPAddress&PortNumbers,URLs,Client/ServerModel,SocketBasics,ServerSocket,Applets,JDBC,RMI.

Bookofstudy:-

1.KenArnold,JamesGosling;TheJavaProgrammingLanguage,
►►Addison-WesleySecondEdition.
2.JoeWigglesworth,PaulaLumby:JavaProgrammingAdvanced
►►Topics,ThomsonLearning
3.Deitel&Deitel;JavaHowtoProgram,PearsonEducation
4.ElliotteRustyHarold;JavaNetworkProgramming,3RDEdition
5.XavierC.;ProgrammingwithJAVA2,SCITECH

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ModuleIII(18Hrs)

*************************************SystemAdministration-creatinganddeletingusers-mountingfilesystems-mount,umount-changingpasswords-passwd-networkadministration*****netstat,ping,ifconfig,traceroute-remotelogin-telnet,ssh,filetransfer-ftp.processrelatedcommands-ps,kill-archiving-tar,gzip,Installation*****ofpackagesusingrpmcommand-Understandingvariousservers-DHCP,DNS,Apache,squid.

ModuleIV(14)

**************************************IntroductiontoPHP-Advantages*****features-PHPsyntax-variables-PHPtagsandstyles-datatypes,variables,operators-typecasting-arrayoperators-controlstructures-arrays-sortingarrays-filefunctions-stringfunctions-functionsinPHP

ModuleV(10Hrs)

**************************************ObjectOrientedConceptsinPHP*****classes,objects,inheritance,overloadingandoverriding*****interfaces-exceptionhandlingtechniques.

Bookofstudy

1.Linux(Fedora)Bible,ChristopherNegus,WileyIndiaEdition,2007
2.LinuxAdministrationAbeginnersguide2nd Edition.
3.BeginningPHP5,Apache,MYSQL,webdevelopmentWroxpublication.

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<u>BCS505:OPENCOURSE*</u>

<u>BCS506LinuxProgramming*ProjectinJava</u>

<u>PartALinuxLab</u>

1. IntroductiontoLinux*****Booting,login-simplecommands(2hrs)
2. Bash-wildcardcharacters*****grep-pipe-tee-commandsubstitutions*****Shellvariables*****subshells*****export*****filters*****pr,head,tail,cut,paste,sort,uniq,nl.grep,tr,join,-editors*****viandemacs-Communicationandschedulingcommands*****mail,talk,write,wall,at,cron*****processrelatedcommands-ps,kill,nohup,nice,time*****archieving*****tar*****gzip*****rpm(8hrs)
3. Shellprogramming*****shellvariables,read,echo,commandlinearguments&&,||,if,whilecase,for,until,test,set,shift,trape(8hrs)

4. Systemadministration□booting,init,runlevels,creatingusersandgroups,systemdatabases□password,group,shadow,inittab,inetd.conf-startupscripts□shutdown□mount□fsck□networkadministration□netstat,ping,traceroute,ifconfig□telnetandftp(6hrs)
5. X-windowssystems□concepts,windowmanagers,KDEandGNOME□settingupservers□DHCP□DNS□NFS-proxy-apache□samba(2hrs)

PartB-JavaProject(38hrs)

SEMESTERVI

BCS601:□□ParallelProcessing

Module1(12hrs)
Introductiontoparallelprocessing:Parallelisminuniprocessorsystems,parallelcomputerstructures,Architecturalclassificationschemes(Flynn□s,Feng□sandhandler□s),parallelprocessingapplications.
□
Module2(16hrs)
Pipeliningandvectorprocessing:Linearpipelining,classificationofpipelineprocessors,Instructionandarithmeticpipelines,principlesofdesigningpipelinedprocessors,characteristicsofvectorprocessing

Module3(14hrs)
StructuresandalgorithmsforArrayprocessors:SIMDarrayprocessors,SIMDinterconnectionnetworks,parallelalgorithmsforarrayprocessors

Module4(16hrs)
Multiprocessorarchitectureandprogramming:functionalstructuresofmultiprocessorsystems,interconnectionnetworks,multiprocessoroperatingsystems,interprocessorcommunicationmechanisms

Module5(14hrs)
Dataflowcomputers:Distinctionbetweencontrolflowanddataflowcomputers,dataflowgraphsandlanguages,advantagesanddisadvantagesofdataflowcomputers,dataflowcomputerarchitectures

Bookofstudy
ComputerArchitectureandparallelprocessing-KaiHwangandFABriggs

References
1. IntroductiontoComputerArchitecture-StoneHS(Galgotiapublishers)
2. TheArchitectureofpipelinedcomputers-KoggiH(McGrawHill)

BCS602:COMPUTERGRAPHICSANDMULTIMEDIA

Module1(12hrs)
OverviewofGraphicsSystem:displaydevices,rasterscansystems,randomscansystems,inputdevices,graphicssoftware.
OutputPrimitives:pointsandlines,linedrawingalgorithms,DDA,Bresenhamslinealgorithm,circlegeneratingalgorithms,Bresenhams,Mid-point,Filledareaprimitives.

Module2(18hrs)
AttributesofOutputPrimitives:Line,Curve,Areafill,Charactertext,MarkerAntialiasing.2DTransformations:Basictransformations,MatrixrepresentationsandHomogeneousco-ordinates,Compositetransformations,Reflection,Shear.2DViewing:viewingpipeline,windowtoviewportco-ordinatetransformations,clippingoperations,point,line-CohenSutherlands,polygonclipping-Hodgemans,Weilor-Atherton,curve,text.

Module3(16hrs)
Structures:concepts,basicmodelingconcepts,interactivegraphics,logicalclassificationofinputdevices,inputfunctions,interactivepictureconstructiontechniques.
3DConcepts:Introductionto3Dgraphics,displaymethods,3Drepresentations-polygonsurfaces.

Module4(16hrs)
DefinitionofMultimedia;Applications,HardwareandSoftwarerequirementsforcreatingmultimedia;Buildingblocksofmultimedia text,graphics(image),video,audio,animation;Differenttypesofanimation;Briefoverviewofstagesinexecutionofmultimediaproject preproduction,productionandpostproductionphases.

Module5(12hrs)

WhatisCompression;LossyandLosslesscompression;Compressiontechniques□RLEintextandimage,LZW,Huffman□sCoding,GIF,JPEG,MPEG,Fractal,Wavelet;ImageFiletypes;AdvancedMultimedia□VirtualReality,AugmentedReality,VideoConferencing,Morphing,voIP,VideoonDemand.

Booksofstudy:

1. ComputerGraphics□Hearn&Baker-PearsonPrenticeHall,2005.
2. □□Multimedia:MakingItWork-□TayVaughan□5th Edition□TataMcGrawHill□□□□

References

1. ComputerGraphicsPrinciplesandPractice-Foley,VanDam,Feiner,Hughes,□□□□□□□□□□□Pearsoneducation,2006.
2. PrinciplesofInteractiveComputerGraphics□NewmanSSproull(Mc-GrawHill)

□□□□□3.□FundamentalsofMultimedia□Ze-NianLi,MarkSDrew□PearsonEducation
□□□□□4.□MultimediaCommunications□Applications,Networks,Protocolsand□□□□□□□□□□□□□Standards□FredHalsall□PearsonEducation.
□□□□□5.□InteractiveCommunicationthroughMultimedia□Anoverview-NIIT.
□□□□□6.□ComputerNetworks-AndrewSTanenbaum□4th Edition,PHI.

<u>BCS603(A):DATAMINING</u>

UnitI:□Introduction□DataMining,DataWareHouse,TransactionalDatabases,DataMiningFunctionalities□CharacterizationandDiscrimination,Miningfrequentpatterns,Associationandcorrelation,ClassificationandPrediction,ClusterAnalysis,ClassificationofDataMiningSystems,DataMiningTaskPrimitive,IntegrationofDataMiningsystems,MajorissuesinDataMining,Dataintegrationandtransformation,Datareduction,Datadiscretization.
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UnitIII: AssociationRulesandClassificationConcepts►EfficientandScalableFrequent itemsetMiningmethods,Miningvariouskindofassociationrules,fromassociationminingtoCo-relationanalysis,Classificationandprediction,Issues,ClassificationbyDecisiontreeinduction,BayesianClassification,Rule-basedclassification,SupportVectorMachines,Learningfromyourneighbors,Prediction.

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OverviewofC/Scomputing:DispellingtheMyths,Obstacles-Upfrontandhidden,opensystemsandstandards,Standardssettingorganizations,factorsofsuccess.

Unit2

Clienthardwareandsoftware:Clientcomponentsandoperatingsystems.WhatisGUI?,Xwindowvs.windowing,databaseaccess.
Applicationlogicclientsoftwareproducts:GUIenvironments,converting3270/5250screens,databaseaccesstools.
Clientrequirements:GUIdesignstandards,OpenGUIstandards,Interfacedependents,testinginterfaces,developmentaides.

Unit3

Serverhardware:Benchmarks,categoriesofservers,featuresandclassesofservermachines.
ServerEnvironment:eightlayersofsoftware►s,networkmanagementandcomputingenvironments,extensions,networkoperatingsystems,loadablemodules.
Serveroperatingsystems:OS/2,Windowsnewtechnology,UNIXbasedoperatingsystems.

Unit4

ServerRequirements:Platformindependence,transactionprocessing,connectivity,intelligentdatabase,storedprocedures,Triggers,LoadLeveling,Optimizer,testinganddiagnostics tools,realabilitybackupandrecoverymechanisms.
Serverdatamanagementandaccesstools:Datamanagerfeatures,datamanagementsoftware,databasegateways.LANhardwareandsoftware,NetworkOperatingSystems.

Text

1.DawnaTravisDewire,ClientServerComputing,McGrawHillInternational

References

1.►►TanenbaumandVanSteen,DistributedSystems►PrinciplesandParadigams,►►►

BCS603(C):ImageProcessing

Unit1:Introduction►stepsinimageprocessing,Imageacquisition, representation,samplingandquantization,relationshipbetweenpixels.►color models►basicsofcolorimageprocessing.

Unit2:Imageenhancementinspatialdomain►somebasicgraylevel transformations►histogramprocessing►enhancementusingarithmetic,logic operations►basicsofspatialfilteringandsmoothing.

Unit3:ImageenhancementinFrequencydomain►IntroductiontoFourier transform:1-D,2►DDFTanditsinversetransform,smoothingandsharpening filters.

Unit4:Imagerestoration:Modelofdegradationandrestorationprocess►noise models►restorationinthepresenceofnoise-periodicnoisereduction..Image segmentation:Thresholdingandregionbasedsegmentation.

Unit5:Imagecompression:Fundamentals►models►informationtheory► errorfreecompression►Lossycompression:predictiveandtransformcoding. JPEGandMPEGstandard.

►BookofStudy:
R.C.Gonzalez,R.E.Woods,2002,DigitalImageprocessing,2ndEdition,Pearson Education.

ReferenceBooks
(i)AnilK.Jain,1994,FundamentalsofDigitalimageProcessing,2ndEdition, PrenticeHallofIndia,NewDelhi.
(ii)Pratt.W.K.,DigitalImageProcessing,3rdEdition,JohnWiley&Sons.
(iii)RosenfledA.&Kak,A.C,1982,DigitalPictureProcessing,vol.I&II,Academic Press.
3.Website,E-learningresources
(i)http://www.imageprocesssingplace.com/DIP/dip-downloads/

BCS603(D):BIO-INFORMATICS

Unit1: FundamentalOfBiologicalSystems:Cell-cellorganelles-Eukaryotic, Prokaryoticcell-Celldivision-Mitosis-Meiosis-Macromolecules: Carbohydrates-Protein-Lipids-Nucleicacid-StructureofDNAandRNAVirology-StructureofHIV-AIDS-Cancer/Oncogenes

Unit2: FundamentalsOfBioinformatics:Definition-Bioinformaticsin industrialapplications-ImportanceofBioinformatics-Genomics-Typesof Genomics-Proteomics-Sequenceanalysis-Sequencealignment-Hidden MarkovModel-TypesofAlignment-BLAST-FASTA-Interpro-Cog

Unit3: BiocomputingAndBioprogramming:Rasmol-Clustalw-Biological databases-Nucleotidesequencedatabase-Proteinsequencedatabase-EMBLDDBJ-Genalysis-IntroductiontoPERLandBio-PERL-IntroductiontoSQL commands.

Unit4: LinuxAndUnixForBioinformatics:BasicUnixcommands-Basic Linuxcommands-WebresourcesinBioinformatics.

Unit5: AppliedBioinformatics:CommercialBioinformatics-Definitionfor Bioinformaticscompany-Transcriptome-SNP$\diamond$sandtheirapplications-PatentinganddatagenerationfromPatentliteratureforcommercialbenefits-PRandBioinformatics.

BookofStudy

$\diamond$(i)V.R.Srinivas,2005,Bioinformatics$\diamond$Amodernapproach,PrenticeHallofIndia, NewDelhi.
(ii)JWatson,MolecularBiologyoftheCell.(Unit$\diamond$1)
(iii)A.Batiza,A.Finney,Schacter,BerniaMullis,KaryB,2005,Bioinformatics, Genomics,Proteomics:GettingtheBigPicture,ChelseaHousePublications,NewYork,(Unit$\diamond$2)
(iv)H.Rashidi,2000,BioinformaticsBasics,CRCPressLtd.(Unit-2)
(v)Moorhouse,MichaeBarry,Paul,2004,Bioinformatics,BiocomputingandPerl: AnIntroductiontoBioinformaticsComputingSkillsandPractice,JohnWiley& Sons.(Unit$\diamond$3)
(vi)CynthiaGibas,PerJambeck,2001,DevelopingBioinformaticsComputer software,O$\diamond$ReillyPublications,Sebastopol,USA(Unit$\diamond$3)
.
2.Websites,E-learningmaterials
(i)http://www.bioinformaticsonline.org/ch/cho1/index.html

BCS604:SEMINAR

BCS605:PROJECT