Syllabus SEM IV

4CS205PC/4DS205PC/4AD205PC/4KE205PCDATA COMMUNICATION AND NETWORKING

CoursePre-requisite:
ComputerandDataCommunicationRequirements

CourseObjectives:
Throughoutthecourse,studentswillbeexpectedtodemonstratetheirunderstandingof DataCommunicationandNetworkingbybeingabletodoeachofthefollowing:

- Studythebasictaxonomyandterminologyofthedigitalcommunicationsystem Computernetworkingandenumeratethelayersof OSImodelandTCP/IPmodel.
- AcquireknowledgeofApplicationlayerparadigmsandprotocols.
- StudyTransportlayerdesignissues,Transportlayerservices,andprotocols.
- GaincoreknowledgeofNetworklayerroutingprotocolsandIPaddressing.
- Studydatalinklayerconcepts,designissues,andprotocols.

CourseOutcomes(CO's):
Oncompletionofthecourse,thestudentswillbeableto:

1. DescribethefunctionsofeachlayerinOSIandTCP/IPmodel.
2. DescribetheTransportlayerandTransportlayerservices.
3. Classifytheroutingprotocolsandanalyzehowtoassigntheip addressesforthegiven network.
4. Explain the functions of Application layer and Presentation layer paradigms and Protocols.
5. Describethefunctionsofdatalinklayerandexplaintheprotocols.
6. Explainthetypesoftransmissionmediawithrealtimeapplications.

Syllabus:

UnitI:IntroductiontoNetworkModels(Hours:07)

Data Communication Components: Basic network types, switching mechanisms, Internetstandards.**LayeredArchitecture**:OverviewoftheOSIandTCP/IPmodels, focusingonkeyfunctionsofeachlayer.

UnitII:(Hours:07)
TransmissionMedia:Guidedvs.Unguidedmedia,keycharacteristics,andreal-time application examples. **Switching Techniques**: Circuit, Packet, and Virtual Circuit Switching.

UnitIII:ApplicationLayerProtocols-(Hours:07)
Application Layer Overview: Client-server model, APIs, P2P networking.**Key Protocols**: HTTP,FTP,SMTP,DNS,focusingontheirimportanceininternetcommunication.

UnitIV:TransportLayerFundamentals-(Hours:07)

Transport Layer Overview: Principles of connectionless and connection-oriented services.**KeyProtocols**:UDP,TCP–Conceptsofreliability,congestioncontrol,flow control.**MultiplexingandDemultiplexing**:Basicmechanismsandtheirrelevancein datatransmission.

UnitV:NetworkLayerProtocolsandIPAddressing-(Hours:07)

Network Layer Overview: Services provided by the network layer, datagram vs. virtual circuitapproaches.**IPAddressing**:IPv4,IPv6,NAT,DHCP,andICMPfunctionalities. **Routing**: Introduction to routing algorithms (Distance Vector and Link-State), basic concept of forwarding.

UnitVI:DataLinkLayerandMACProtocols-(Hours:07)

DataLinkLayerServices:Framing,errordetection(CRC,Checksum),andcorrection techniques.**MACLayer**:ConceptsofLANaddressing,ARP,CSMA/CD,andPPP. **Link LayerProtocols**:HDLCandPoint-to-PointProtocol.

TextBooks:

1. BehrouzA.Forouzan:DataCommunicationandNetworking,(5/e)(TMH)
2. JamesF.KuroseCKWRoss:ComputerNetworking,PearsonEducation(LPE)

ReferenceBooks:

1. WilliamStallings:DataCComputerCommunications,6/e,PearsonEducation
2. WilliamL.Schweber:DataCommunication,McGrawHill
3. DouglasE.Comer:ComputerNetworkCInternet,AddisonWesley.
4. AndrewS.Tanenbaum:ComputerNetworks,PHI(5E)
5. LeonGarciaCWidjaja:CommunicationNetworks,TMH

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4CS206PC/4DS206PC/4AD206PC/4KE206PCOPERATINGSYSTEM

CoursePre-requisite:

DiscreteStructures,DataStructure,AnyprogrammingLanguage

CourseObjectives:

1. Tomakestudentsawareofthekernelandshellstructureoftheoperatingsystems.
2. Tomakestudentsawareofthepurpose,structureandfunctionsofoperating systems
3. Toequipstudentswithunderstandingofthevariousschedulingalgorithmsin OS.
4. TomakestudentsawareofunderstandingofmemorymanagementindifferentOS.

CourseOutcomes:(ExpectedOutcome):

Oncompletionofthecourse,thestudentswillbeableto:

- Explainmemorymanagementissueslikeexternalfragmentation,internal fragmentation.
- Illustratemultithreadinganditssignificance.
- Listvariousprotectionandsecuritymechanismsof OS.
- Analyzeandsolvetheschedulingalgorithms.
- Analyzethedeadlocksituationandresolveit.
- Comparevarioustypesofoperatingsystems

Syllabus:

UnitI:IntroductiontoOS(Hours:07)
Introduction:OperatingSystemdefinition,OSEvolution,ComponentsandServices, Process Concept, Process Scheduling, Operations on Processes, Cooperating Processes,InterprocessCommunication,ThreadsOverview,MultithreadingModels, ThreadingIssues,JavaThreads

UnitII:ProcessScheduling (Hours:07)
FoundationandSchedulingobjectives,TypesofSchedulers,Schedulingcriteria:CPU utilization,Throughput,TurnaroundTime,WaitingTime,ResponseTime;Scheduling algorithms:Pre-emptiveandNonpre-emptive,FCFS,SJF,RR,Priority,Multilevel Queue, Multilevel Feedback Queue Scheduling

UnitIII:ProcessSynchronization(Hours:07)
Process Synchronization Basics: The Critical-Section Problem, Synchronization Hardware, Semaphores, Monitors, Deadlocks: Definition C Characterization, DeadlocksPrevention,Avoidance,DetectionandRecoveryfromDeadlock

UnitIV:MemoryManagement (Hours:07)
MemoryManagementBackground,Swapping,ContiguousMemoryAllocation Schemes,Paging,Segmentation,VirtualMemoryManagement:Background,Demand pagingscheme,ProcessCreation,PageReplacementPolicies,AllocationofFrames, Thrashing

UnitV:FileSystem(Hours:07)
File-System Interface; Directory Structure, File-System Mounting, File Sharing CProtection, File- System Structure, File-System Implementation, Directory Implementation,AllocationMethods,Free-SpaceManagement.
UnitVI:I/OSystem(Hours:07)
I/O Systems:Overview,I/O Hardware,Application I/O Interface, Kernel I/O Subsystem, TransformingI/OtoHardwareOperations,DiskScheduling,DiskManagement,Swap- Space Management, RAID Structure.

TextBook:
AviSilberschatz,P.B.Galvin,G.Gagne:"OperatingSystemConcepts"(9/e)John-WileyC Sons.

ReferenceBooks:

1. A.S.Tanenbaum“ModernOperatingSystems”PearsonEducation.
2. WilliamStallings“OperatingSystems”Prentice-Hall.
3. D.M.Dhamdhere“OperatingSystems”TataMcGraw-Hill.
4. P.BalkrishnaPrasad:“OperatingSystems”ScitechPublications(I)Pvt.Ltd.

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4CS207PC/4KE207PC

THEORYOFCOMPUTATION

CoursePre-requisites

- DiscreteMathematics
- DataStructures

CourseObjectives:

- Tounderstandautomatatheoryanditsoperation.
- Tounderstandmathematicalexpressionsforformallanguages.
- Tolearnimplementingthestatemachinesforsolvingreallifeproblems.
- Tostudycomputingmachinesandcomparingdifferenttypesofcomputational models.
- TounderstandthefundamentalsofproblemdecidabilityandUn-Decidability.

CourseOutcomes:(ExpectedOutcome):

Oncompletionofthecourse,thestudentswillbeableto:

1. Toconstructfinitestatemachinestosolveproblemsincomputing.
2. Towriteregularexpressionsfortheformallanguages.
3. Toconstructandapplywelldefinedrulesforparsingtechniquesincompiler.
4. ToconstructandanalyzePushDown,TuringMachineforformallanguages
5. ToexpresstheunderstandingoftheChomskyHierarchy.
6. Toexpresstheunderstandingofthedecidabilityandun-decidabilityproblems.

<u>Syllabus:</u>

UnitI:FiniteStateMachines:(Hours:07)

Alphabet,String,FormalandNaturalLanguage,Operations,DefinitionandDesignDFA (Deterministic Finite Automata), NFA (Non-Deterministic Finite Automata), Equivalence ofNFAandDFA:ConversionofNFAintoDFA,ConversionofNFAwithepsilonmovesto NFA,MinimizationOfDFA,DefinitionandConstructionofMooreandMealyMachines, InterconversionbetweenMooreandMealyMachines.MinimizationofFiniteAutomata. (Construction of Minimum Automaton).

UnitII:RegularExpressionandRegularGrammar:(Hours:07)

DefinitionandIdentitiesofRegularExpressions,ConstructionofRegularExpressionof thegivenLanguage,ConstructionofLanguagefromtheRE,ConversionofFAtoREusing Arden’s Theorem, Inter-conversionREtoFA, PumpingLemmaforRL, Closure properties

ofRLs(proofsnotrequired),Regulargrammar,EquivalenceofRG(RLGandLLG)andFA.

UnitIII:ContextFreeGrammarandLanguages:(Hours:07)
Introduction,FormalDefinitionofGrammar,Notations,DerivationProcess:Leftmost Derivation, Rightmost Derivation, Derivation Trees, Construction of Context-Free Grammars and Languages, Pumping Lemma for CFL, Simplification of CFG, Normal Forms (CNF and GNF), Chomsky Hierarchy.

UnitIV:PushdownAutomata:(Hours:07)
Introduction and Definition of PDA, Construction of PDA, Acceptance of CFL, Equivalence of CFL and PDA: Inter-conversion, Introduction of DCFL and DPDA, Enumeration of properties of CFL, Context Sensitive Language, Linear Bounded Automata.

UnitV:TuringMachines:(Hours:07)
FormaldefinitionofaTuringMachine,DesignofTM,ComputableFunctions,Church's hypothesis,Countermachine,VariantsofTuringMachines:Multi-tapeTuringmachines, Universal Turing Machine.

UnitVI:DecidabilityandUn-Decidability:(Hours:07)
DecidabilityofProblems,HaltingProblemofTM,Un-Decidability:Recursiveenumerable language, Properties of recursive C non-recursive enumerable languages, Post CorrespondenceProblem,IntroductiontoRecursiveFunctionTheory.

TextBook
1. HopcraftH.E.CUllmanJ:IntroductiontoAutomataTheory,Languagesand Computation
2. PeterLinz:AnIntroductiontoFormalLanguagesandAutomata

ReferenceBook
1. RajeshK.Shukla:TheoryofComputation,CENGAGELearning,2009.
2. KVNSunithaandNKalyani:FormalLanguagesandAutomataTheory,McGraw Hill,2010
3. LewisH.P.andPapadimitionC.H.:ElementsofTheoryofComputation
4. MishraCChandrashekharan:TheoryofComputation
5. C.K.Nagpal:FormalLanguagesandAutomataTheory,OxfordUniversityPress, 2011.
6. VivekKulkarni:TheoryofComputation,OUPIndia,2013

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4DS207PC/4AD207PC

PROBABILITYAND STATISTICSFORDATASCIENCE

CourseObjective:
- Understandandapplyprobabilityconcept.
- Learnfoundationalconceptsandapplicationsofprobabilitytheory andcommon probabilitydistributions.

- Understandandapplymeasuresofcentraltendency,dispersion,correlation,and regressionanalysisinstatisticalanalysis.
- Computeandinterpretthecorrelationcoefficient.
- Understandthecomputationaldetailsbehindcertainnumericalmethods.
- Gainproficiencyininterpolationmethodsandnumericaltechniquesforsolvingfirst-orderdifferentialequations.

CourseOutcomes:(ExpectedOutcome):

Oncompletionofthecourse,thestudentswillbeableto:

1. Understandaboutthecollectionofthedata,condensation,andsummarizationinto a compact form.
2. Applyprobabilityaxioms,analyzedistributions,calculateconditionalprobabilities, andunderstandthecentrallimittheorem.
3. Understandand compute measures of centraltendency, dispersion, correlation, and regressionfordata analysis.
4. Apply numerical methods for curve fitting using least squares, including fitting straightlinesandhigher-degreecurves.
5. Utilize numerical methods such as Newton-Raphson, false position, Gauss elimination, Gauss-Jordan, Gauss-Seidel, and matrix operations for solving equations andeigenvalue computations.
6. Apply interpolation techniques and numerical methods to solve differential equationsaccuratelyandefficiently.

<u>Syllabus:</u>

Unit:I(Hours:07)

Meaning of experiment, random experiment, deterministic and non-deterministic models.Definitionoftheterm:Outcome,samplespace(finiteandinfinite),discrete samplespace,Elementaryevent,Compoundevent,Complementaryevent,Favorable event,Equality-likelyevents,Sureevent,Impossibleevent.ConceptofOccurrenceofan event, Union, and Intersection of two or more events, Exhaustive events, mutually exclusive events, Representation of sample space and events by Venn diagram, Occurrence of(i)at leastone of the given events (ii) all of the events (iii) none of the given events,Exampleandproblem.

Unit:II(Hours:07)

AxiomsofProbability, centre limittheorem, conditionalprobability, Bayes'rule, Bernoulli trials, probability mass function, continuous random variable, probability density function,probabilitydistributions:Binomialdistribution,Poissondistribution,normal distribution.

Unit:III(Hours:07)

Measureofcentraltendency:Moments,Expectation,dispersion,skewness,kurtosis, expectedvalueoftwo-dimensionalrandomvariable,LinearCorrelation,correlation coefficient,rankcorrelationcoefficient,Regression,LineofRegression**.**

Unit:IV(Hours:07)

Curve fitting by the numerical method: Curve fitting by of method of least squares, fittingofstraightlines,seconddegreeparabolaandmoregeneralcurves.

Unit:V(Hours:07)

Newton Raphson method, false position method, Gauss elimination, Gauss Jordan, GaussSeidel,MatrixInversionbyGaussJordanmethod,Eigenvalueofamatrixbypower method.

Unit:VI(Hours:07)

Interpolation:ForwardDifference,BackwardDifference,Newton'sForwardDifference Interpolation,Newton'sBackwardDifferenceInterpolation,Lagrange'sInterpolation. NumericalSolutionofFirstorderdifferentialequation:Picard'smethod,Taylorseries, Euler'sMethod,ModifiedEuler'sMethod,Runge-KuttaMethodoffourthorder.

Textbook:

1. Agarwal,B.I.(2047).ProgrammedStatistics,ThirdEdition,NewAgeInternational Publisher, New Delhi.
2. S.S.Shastri.IntroductoryMethodsofNumericalMethods,PHI,Vol2.

ReferenceBook:

1. GuptaS.C.andKapoorV.K.(2019)FundamentalofMathematicalStatistics.
2. NumericalMethodsforScientificandEngineeringComputation'byM.K.Jain,S.R.K. Iyengar,R.K.Jain
3. Myer,P.I.(1970):IntroductoryProbabilityand StatisticalApplication,OxfordCIBH Publishing, New Delhi.

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4CS208PC/4DS208PC/4AD208PC/4KE208PCDA TACOMMUNICATIONsNETWORKINGLAB

CoursePre-requisite:

ComputerandDataCommunicationRequirements

CourseObjectives:

- Tounderstandtheworkingprincipleofvariouscommunicationprotocols
- Tounderstandandanalyzethesignalflowinadigitalcommunicationsystem.
- Toanalyzeerrorperformanceofadigitalcommunicationsysteminpresenceofnoiseand otherinterferences.
- ToevaluatetheerrorsusingvariouserrordetectionCcorrectiontechniques.
- Tounderstandnetworkbasedprotocolsindatacommunicationandnetworking.

CourseOutcomes:

Oncompletionofthecourse,thestudentswillbeableto

1. Analyzeperformanceofvariouscommunicationprotocols
2. ImplementConfigurevariousnetworkprotocols.

3. CompareIPAddressclassesofnetworks

ListofExperiments:

ThisisasamplelistofExperiments;**minimum12experiments**aretobeperformedcoveringthe entiresyllabus.Atleasttwoexperimentsshouldbebeyondsyllabibasedonlearningofsyllabi

1. To study various LAN topologies and their creation using network devices, cables and computers.
2. ToconnectthecomputersinLocalAreaNetwork.
3. FamiliarizationwithNetworkingComponentsanddevices:LANAdapters,Hubs,Switches, Routersetc.
4. WriteaprogramofbitstuffingusedbyDataLinkLayer
5. WriteaprogramtoimplementCRC(CyclicRedundancyCheck)
6. WriteaprogramtoimplementChecksum
7. WriteaprogramtoimplementSlidingwindow
8. ConfigureInternetconnectionanduseIP-Config,PING/TracerandNetstatutilitiestodebug the network issues.
9. ConfigurationofTCP/IPProtocolsinWindowsandLinux.
10. TransferfilesbetweensystemsinLANusingFTPConfiguration,installPrintserverinaLAand sharetheprinterinanetwork.
11. WriteaCProgramtodetermineiftheIPAddressisinClassA,B,C,D,orE
12. WriteaCProgramtotranslateDottedDecimalIPAddressinto32BitAddress.
13. ConfigureHostIP,SubnetMaskandDefaultGatewayinaSysteminLAN(TCP/IP Configuration)

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4CS20GPC/4DS20GPC/4AD20GPC/4KE20GPC
OPERATING SYSTEM LAB

CoursePre-requisite:

Basiccomputerprogramming

CourseObjectives:

- Tomakestudentsawareofthekernelandshellstructureoftheoperatingsystems.
- Tomakestudentsawareofthepurpose,structureandfunctionsofoperatingsystems
- ToequipstudentswithunderstandingofthevariousschedulingalgorithmsinOS.
- TomakestudentsawareofunderstandingofmemorymanagementindifferentOS.

CourseOutcomes:

Oncompletionofthecourse,thestudentswillbeableto

1. Explainmemorymanagementissueslikeexternalfragmentation,internalfragmentation.
2. Illustratemultithreadinganditssignificance.
3. ListvariousprotectionandsecuritymechanismsofOS.
4. Analyzeandsolvetheschedulingalgorithms.
5. Analyzethedeadlocksituationandresolveit.
6. Comparevarioustypesofoperatingsystems

ListofExperiments:

ThisisasamplelistofExperiments;**minimum12experiments**aretobeperformedcoveringthe entiresyllabus.Atleasttwoexperimentsshouldbebeyondsyllabibasedonlearningofsyllabi

1. TostudyLinuxOperatingSystemalongwithitsinstallation.

2. ToStudyandExecutebasicfilecommandsandprocessrelatedopensourceUbuntu commands
    a. Commandstoviewallexecuting,blockandsuspendedprocess.
    b. CommandtocheckandchangeteprioritiyofprocessCPUutilizationforexecuting processes.
    c. Commands to check for child process, sub-processes, process tree, abort C end processand all otherbasics commandsrelated toprocesses
3. WriteaprogramformultithreadingusingC.
4. TosimulateFirstComeFirstServeCShortestJobFirstprocessschedulingalgorithm
5. TosimulateShortestJobFirstprocessschedulingalgorithm
6. TosimulatePre-emptiveShortestJobFirstprocessschedulingalgorithm
7. ToimplementRoundRobinProcessschedulingAlgorithm
8. ToimplementPriorityBasedProcessschedulingAlgorithm
9. Toimplementandanalyzemulti-levelqueueschedulingalgorithm
10. Toimplementthefollowing fileallocationstrategies.
11. Tosimulatepagingtechniqueofmemorymanagement.
12. ToimplementtheFIFOpagereplacementpolicy
13. ToimplementtheLRUpagereplacementpolicy
14. Toimplementtheoptimalpagereplacementpolicy
15. Tosimulateproducer-consumerproblemusingsemaphores.
16. ToimplementDining-Philosophersproblemtodealwithconcurrencycontrolmechanism.
17. Toimplementcontiguousmemoryallocationstrategiestodetectfragmentationusing:First Fit,BestFitandWorstFit.
18. ToimplementFCFSDiskSchedulingalgorithm
19. ToimplementSCANDiskSchedulingalgorithm
20. ToimplementC-SCANDiskSchedulingalgorithm
21. TosimulateBanker'salgorithmfordeadlockavoidance
22. Toimplementfollowingmemorymanagementtechniques
23. ImplementMVTandMFTwherememoryblocksizeis100for5processes.Enterno.ofblocks foreachprocessandcalculateinternalfragmentation.
24. TosimulateLFUpagereplacementalgorithms
25. TosimulatetheSingleleveldirectoryfileorganization techniques.
26. ToSimulatebankersalgorithmforDeadLockAvoidance(Banker'sAlgorithm)

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4CS306VS/4DS306VS/4AD306VS/4KE306VS

ComputingSkill#1LAB(VSEC-III)

(Basedontechnologylike-Python/Djangoetc.tobedecidedbyIndividualDept.ofrespective College)

CoursePrerequisite:

BasicknowledgeofanyProgrammingLanguage

CourseObjectives:

- TobeabletoprogramdesignwithfunctionsusingPython.
- Tounderstanddataandinformationprocessingtechniques.
- TounderstandtoDesignaprogramtosolvetheproblems.
- Tobeabletoaccessdatabaseusingpythonprogramming.

- Tobeabletodesignwebapplicationsusingpythonprogramming.

CourseOutcomes:

Oncompletionofthecourse,thestudentswillbeableto

1. DescribetheNumbers,Mathfunctions,Strings,List,TuplesandDictionariesinPython
2. InterpretdifferentDecisionMakingstatements,Functions,Objectorientedprogrammingin Python
3. SummarizedifferentFilehandlingoperations
4. ExplainhowtodesignGUIApplicationsinPythonandevaluatedifferentdatabaseoperations
5. DevelopapplicationsusingDjangoframeworkorFlask

ListofExperiments:

Thisisasamplelistof Experiments,**minimum12experiments**aretobeperformedcoveringthe entiresyllabus.Atleasttwoexperimentsshouldbebeyondsyllabibasedonlearningofsyllabi

1. Writepythonprogramtostoredatainlistandthentrytoprintthem.
2. Writepythonprogramtoprintlistofnumbersusingrangeandforloop
3. Writepythonprogramtostorestringsinlistandthenprintthem.
4. Writepythonprograminwhichanfunctionisdefinedandcallingthatfunctionprintsthe Hello World.
5. Writeapythonscripttoprintthecurrentdateinthefollowingformat“SunMay2902:26:23 IST
6. 2017”
7. Writeaprogramtocreate,append,andremovelistsinpython.
8. Writeaprogramtocreate,concatenateandprintastringandaccessingsub-stringfroma givenstring.
9. Writeaprogramtodemonstrateworkingwithtuplesinpython.
10. Writeaprogramtodemonstrateworkingwithdictionariesinpython.
11. Writeapythonprogramtofindlargestofthreenumbers.
12. Writepythonprograminwhichanfunction(withsinglestringparameter)isdefinedand callingthatfunctionprintsthestringparametersgiventofunction.
13. Writepythonprograminwhichanclassisdefine,thencreateobjectofthatclassandcall simpleprintfunctiondefineinclass.
14. WriteaPythonscriptthatprintsprimenumberslessthan20.
15. Writeapythonprogramtofindfactorialofanumberusing Recursion.
16. Writeapythonprogramtodefineamoduletofind Fibonacci Numbersandimportthemodule to another program.
17. Writeascriptnamedcopyfile.py.Thisscriptshouldprompttheuserforthenamesoftwotext files.Thecontentsofthefirstfileshouldbeinputandwrittentothesecondfile.
18. Writeaprogramthatinputsatextfile.Theprogramshouldprintalloftheuniquewordsinthe fileinalphabeticalorder.
19. WriteaPythonclasstoconvertanintegertoaromannumeral.
20. WriteaPythonclasstoimplementpow(x,n)
21. WriteaPythonclasstoreverseastringwordbyword.
22. AccessingandworkingwithdatabasesusingPython.
23. Createdataframefrom.csvfilesandoperationsonit.
24. PlottingvariousgraphsusingPython.
25. DevelopingbasicGUIusingPython.
26. DevelopingwebapplicationsusingDjangoframeworkorFlask

ReferenceBooks:

1. “CorePythonProgramming”,R.NageswaraRao,dreamtechpress.

2. “PythonProgrammingAModularApproachWithGraphics,Database,Mobileand WebApplications”,SheetalTaneja,NaveenKumar,Pearson.
3. PythonWebDevelopmentwithDjangoByJeffForcier,PaulBissex,WesleyJChun,Addison- Wesley Professional.
4. KennethA.Lambert,TheFundamentalsofPython:FirstPrograms,2011,CengageLearning
5. AllenB.Downey,“ThinkPython:HowtoThinkLikeaComputerScientist”,SecondEdition,
6. Shroff/O’ReillyPublishers
7. JohnVGuttag.“IntroductiontoComputationandProgrammingUsingPython”,PrenticeHall ofIndia
8. MichaelT.Goodrich,RobertoTamassia,MichaelH.Goldwasser, “DataStructuresand AlgorithmsinPython”,Wiley
9. IntroductiontoComputationandProgrammingusingPython,byJohnGuttag,PHIPublisher, RevisedandExpandedversion(ReferredbyMIT)

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4CS217EM /4KE217EM / 4DS217EM /4AD217EM
SOCIALSCIENCES sENGINEERING ECONOMICS

CourseObjectives:

Bytheendofthecourse,studentswill:

- Understandtheimportanceofsocialsciencesandeconomicsinengineering.
- GainknowledgeoftheIndianConstitution,governance,andpolicy-making.
- Learnabouteconomicprinciples,markettrends,andfinancialinstitutions.
- Examinetheimpactofscience,technology,andeconomictransformationsonsociety.
- Understandprofessionalethicsandresponsibilitieswithsocioeconomicconsiderations.

CourseOutcomes(COs):

Oncompletionofthecourse,studentswillbeableto:

1. Understandthesignificanceofsocialsciencesandeconomicprinciplesinengineering.
2. Analyzetheroleofgovernance,laws,andpoliciesinshapingsocietyandbusiness environments.
3. Applyeconomicandmarketprinciplestoassessfinancialsystemsandbusinesstrends.

Syllabus:

UnitI:SocialSciencesandGovernance(7Hours)[CO1]

Importance of Social Sciences in Engineering, Indian Constitution: Salient features, Fundamental Rights and Duties, Directive Principles of State Policy, Governance in India: Structureof Indian Parliament, Role andPowersof the President, Prime Minister,and Councilof Ministers.

UnitII:Society,Science,andTechnology(7Hours)[CO2]

Impact of Science and Technology on Culture and Civilization, Human Society: Structure, community groups, social institutions, Marriage and Family Systems: Types, functions, and modernchallenges,ProductionCBusinessOrganizations:Factorsofproduction, lawsofreturn, types of business entities.

UnitIII:EconomicsandMarketTrends(8Hours)[CO3]

Natureand Scopeof Economics:Special significance to engineers, Economic Development: Characteristics of underdevelopment, obstacles to economic growth, vicious circle of poverty. Banking C Financial Systems: Functions of Central and Commercial Banks, GST overview, Market Structures:PerfectCimperfectcompetition,monopoly,pricingmechanisms.

Textbook:

1. PyleeM.V.:ConstitutionalGovt.inIndia,S.ChandandCo.
2. CNShankarRao:Sociology,S.ChandandCo.

ReferenceBooks:

1. DewettandVarmaJ.D.:ElementaryEconomicTheory,S.ChandandCo.
2. A.N.Agrawal:IndianEconomy,ProblemofDevelopmentandPlanning(WileyEasternLtd), NewDelhi.
3. S.K.Mishra:IndianEconomy,ItsDevelopmentExperience.HimalayaPub.House,Bombay.
4. E.Kuper:EconomicsofW.R.Development,McGrawHillCo.,
5. BrijKishoreSharma.:TheConstitutionofIndia,PHI.
6. Mahajan:TheConstitutionofIndia,S.Chand,NewDelhi.
7. MaclaverandPage:PrincipleofSociology.
8. DavisK.:HumanSociety
9. DattR.K.:IndianEconomy,S.ChandandComp.NewDelhiP.M.Sundharam
10. DhingraI.C.:IndianEconomy

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