SCHEMEOFCOURSEWORK

DEPARTMENTOFINFORMATIONTECHNOLOGY

CourseDetails:

COURSETITLE	DATASTRUCTURES		
COURSECODE	15CT1105	LTPC	3 1 0 4
PROGRAM	B.TECH		
SPECIALIZATION	IT		
SEMESTER	III		
PRE REQUISITES	COMPUTER PROGRAMMING THROUGHC		
COURSESTOWHICHIT IS A PREREQUISITE	N/A		

CourseOutcomes(COs):

CO- 1	Applyconceptsofstacks and queues
CO- 2	Applyconceptsoflinkedlists
CO- 3	Developprograms forsearchingand sorting

PO-1	Abilitytoapplythe knowledge ofmathematics,science,engineeringfundamentals andprinciples of Information Technologytosolveproblems in different domains.
PO-2	Abilitytoanalyze a problem,identify andformulate thecomputing requirementsappropriatetoits solution.
PO-3	Abilitytodesign&developsoftwareapplicationsthat meetthedesiredspecifications withinthe realisticconstraintsto serve theneedsofthe society.
PO-4	Abilitytodesign andconductexperiments,aswell astoanalyzeand interpretdata
PO-5	Abilitytouseappropriatetechniques&toolsto solveengineering problems.
PO-6	Abilitytoapplythe knowledge to analyzeandunderstand societal,health,safety,legal, andcultural issuesrelevantto theInformation Technologypractices.
PO-7	Abilitytoanalyze thelocaland globalimpact ofcomputingon individual aswellas onsociety.
PO-8	Abilitytodemonstrateprofessionalethical practicesandsocial responsibilities in globalandsocietalcontexts.
PO-9	Abilitytofunction effectivelyasan individual,and as amemberorleaderin diverseandmultidisciplinaryteams.
PO-10	Abilitytocommunicateeffectively withtheengineering communityandwith society at large

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CO- 4	Developprogramsusingconceptsoftrees
CO- 5	Applyconceptsofgraphs

ProgramOutcomes(POs):

A graduateof InformationTechnologywillbeableto

PO-11	Abilitytounderstandengineering andmanagementprinciples and applythesetoone'sown work, as amemberand leader inateam,tomanageprojects.
PO-12	Abilitytorecognizethe needfor updating the knowledge inthe chosen fieldandimbibinglearning tolearn skills.

CourseOutcomeversusProgramOutcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO-1	3	3	3	3	3						2		3	2	
CO-2	2		2	3				2		2			3	2	
CO-3	3	3	3		3								3	2	
CO-4		2		3	2		2			2		2	3	2	
CO-5	3	3	3		3	2			2				3	2	

S -Stronglycorrelated,M- Moderatelycorrelated,Blank-Nocorrelation

Assessment Methods	Assignment/Quiz/Mid-Test

Teaching-LearningandEvaluation

Week	Topic/Contents	Course Outcomes	SampleQuestions	Teaching Learning Strategy	Assessment Method& Schedule
1.	Stacks:Introduction,StackOperations,Applicationsofstacks,Examples	CO1	1.Explainthestackoperationswithexamples.	Lecture Programming	Assignment-1,Test-1Quiz-

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2.	Queues:Introduction,Operationsonqueues,CircularQueues,Priorityqueues,Applicationsofqueues	CO1	1. ExplaintheoperationofDEQUEUEwithsuitableexample. 2. SupposeaStackimplementationsupports,inadditiontoPUSHandPOP,anoperationREVERSE.Toimplementaqueueusingtheabovestackimplementation,showhowtoimplementENQUEUEusingasingleoperationandDEQUEUEusingasequenceof3operations.WritefunctionsforENQUEUEandDEQUEUE	Lecture Programming	1 Assignment1,Test-1Quiz1
3.	LINKEDLISTS:Introduction,Singly linked lists,circular	CO2	1.Performinsertionanddeletionoperations	Lecture Programming	Assignment-1,Test-1Quiz-

	linkedlists,doublylinkedlists		ondoublylinkedlists.		
4.	Multiplelinkedlists,applications.LINKEDSTACKSANDLINKEDQUEUES:Introduction	CO2	1.Implementstacksusinglinkedlistin Cand explainwithsuitableexample.	LectureProgramming	Assignment1,Test-1Quiz1
5.	OperationsonlinkedstacksandlinkedqueueDynamicmemorymanagementandlinkedstacks	CO2	1. Writeaproceduretoinsertanelementintostackusinglinkedlist. 2. Differentiatemalloc()andcalloc()functi ons.	LectureProgramming	Assignment1,Test-1Quiz1
6.	Implementationoflinkedrepresentations,applicationsSEARCHING:Introduction,linearsearch,transposesequentialsearch	CO2,CO3	1.Writeaproceduretoimplementlinearsearch.	LectureProgramming	Assignment1,Test-1Quiz1
7.	Test-1				
8.	Interpolationsearch,binarysearch,Fibonaccisearch.INTERNALSORTING: Introduction,bubblesort,insertionsort	CO3	1.Withasuitableexample,explainFibonaccisearch.2.Explaintheprocedureforsortingalistusing Bubblesort	LectureProgramming	Assignment2Test-2Quiz-2

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9.	Selectionsort,mergesort,quicksortTREESANDBINARYTREES: Introduction,Trees:definitionandbasicterminologies,representationoftrees	CO3,CO4	1.Explainselectionsortwithsuitableexampleanddiscussthetimeandspacecomplexityforselectionsort.2.Explainaboutbinary treetraversals.	LectureProgramming	Assignment2Test-2Quiz-2
10.	Binarytrees:basicterminologiesandtypes,representationofbinarytrees,binarytreetraversals	CO4	1.Writearoutinetolistout the nodesofabinarytreeinlevelorder.Listtheroot,then nodesatdepth1,followed bynodesatdepth2,andso on.Youmustdothisinline artime	LectureProgramming	Assignment2Test-2Quiz-2
11.	Applications.BINARYSEARCHTREESANDAVL TREES:Introduction,binarysearchtrees:definitionandoperation,Exampleprograms	CO4	1.ExplainBinarySearchtrees,writethealgorithmsandC++implementationforinsertion,deletion,andsearchoperations	LectureProgramming	Assignment2Test-2Quiz-2
12.	AVLTrees:definitionandoperations,applications,Exampleprograms	CO4	1.Showtheresultofinsertingelements2,1,4,5,9,3,6and7intoaninitiallyemptyAVL-tree.	LectureProgramming	Assignment2Test-2Quiz-2
13.	GRAPHS:Introduction, definitionsandbasic	CO5	1.Explaindifferentgraphrepresentations	LectureProgramming	Assignment-2Test-2Quiz-2

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	terminologies		withneatdiagrams.		
14.	Representationsofgraphs,Depthfirsttraversal,Example. Breadthfirsttraversal, Example	CO5	1.Defineanalgorithmfor DFSand verifywithanexample	LectureProgramming	Assignment2Test-2Quiz-2
15.	Test-2				