DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI

COURSE OUTLINE

Course Title	Data Structures and Algorithms – A & B Section		
Course Code	EE314	No. of credits	04
Department	EEE	Faculty	S.Sudha
Pre-requisites course code	CSIR11		
Course Co-ordinator(s)	----		
Other Course Teacher(s)/Tutor(s) E-mail	Uma.gk12@gmail.com	Telephone No.	9443329313
Course Type	☑ Core course	☐ Elective course	

COURSE OVERVIEW

This course on data structures and algorithms is recognised by the study of the data involved in the digital sources and algorithms to operate on these data for processing. The various types of data and their storage representation is dealt here. The data classifications based on their storage and their access patterns are discussed. It also covers the algorithms that are formulated to process these data.

COURSE OBJECTIVE

To obtain knowledge on the various types of data structures, their storage representation in memory and their usage in an algorithmic perspective.

COURSE OUTCOMES (COs)	Aligned Programme Outcomes (POs)					
Upon completion of this course, students will have	COs/POs	Course outcomes (Cos)				
		1	2	3	4	5
1. Knowledge on algorithmic notations and concepts	1	H	L	L	M	M
	2	H	M	M	H	H
	3	NA	NA	NA	NA	NA
2. Clear understanding of the primitive data structures and their applications	4	NA	NA	NA	NA	NA
	5	NA	NA	NA	NA	NA
3. Familiarity of linked linear and non-linear data structures and operations on such data structures	6	H	H	H	H	H
	7	M	H	M	H	H
	8	H	H	H	H	H
4. The awareness of various sorting, searching algorithms and file structures	9	M	H	H	H	H
	10	L	H	M	L	L
	11	M	H	M	H	H
5. The ability to design and develop menu driven application programs	12	M	H	M	H	H
	13	M	H	M	H	H
	14	NA	NA	NA	NA	NA

(Programme Outcomes (POs) — row label for the left vertical axis of the CO/PO table)

SI.No.	Week	Topic	Mode of delivery
	COURSE TEACHING AND LEARNING ACTIVITIES		
1	2nd week of July , 2017 (10 – 14) (4 contact hours)	Introduction to data structures, Operations and Expressions, Statements and Control Structures with examples, Functions, Procedures.	
2	3rd week of July , 2017 (17 – 21) (4 contact hours)	Algorithmic Notation, examples of formulating algorithms, nature, storage and transmission of information,	
3	4th week of July , 2017 (24-28) (4 contact hours)	Time and Space requirement Analysis, examples dealing with time and space complexity analysis. Introduction to Primitive Data structures **Assessment -1 (objective type – 10 marks)**	Lecture/ Tutorial C & T/ PPT or any suitable mode
4	1st week of August, 2017 (1 – 4) (4 contact hours)	Linear Data structures and their Sequential storage representation: Arrays, Array operations and their applications.	
5	2nd week of August, 2017 (8-11) (3 contact hours)	Tutorials on Arrays. Structures, array of structures, strings; their storage representation.	
6	3rd week of August, 2017 (14 – 18) (3 contact hours)	String manipulation. .Tutorials on strings and array of structures. Stacks, their storage representation	
7	4th week of August , 2017 (21 – 24) (3 contact hours)	Stacks applications. Recursive functions, Queues and their types, storage representation and applications.	
8	5th week of August, 2017 (28-31) (4 contact hours)	Different types of queues and tutorials on queues. Linear Data structures, pointers. **Assessment -1I (Written test – 15 marks)**	
9	1st week of September, 2017 (1-8) (4 contact hours)	Linked allocation, Single list, their linked storage representation and operations, Single lists applications.	
10	2nd week of September,2017 (11-15) (4 contact hours)	Double linked lists and their storage and applications, Circular linked list, storage and their applications.	

11	3rd week of September, 2017 (18 – 22) (4 contact hours)	Tutorials on linear linked structures. **Assessment -1II (Written test – 15 marks)**	
12	4th week of September, 2017 (25 – 29) (4 contact hours)	Nonlinear data structures, Trees, Storage representation of trees, operation on binary trees.	
13	1st week of October, 2017 (3-6) (3 contact hours)	Application of trees. **Assessment –IV (Objective type – 10 marks)**	Lecture/ Tutorial C & T/ PPT or any suitable mode
14	2nd week of October, 2017 (9-13) (3 contact hours)	Tutorials on trees, Graphs- representations and applications of graphs.	
15	3rd week of October, 2017 (16,17) (3 contact hours)	Tutorials on graphs. Sorting: Selection Sort, Bubble Sort , Merge Sort **Assessment –V (Practical – 20 marks)**	
16	4th week of October, 2017 (23-27) (4 contact hours)	Tree Sort, Partition- Exchange Sort. Radix sort, Tutorials and analysis of sorting algorithms	
17	5th week of October, 2017 (30-31) (3 contact hours)	Searching : Sequential searching , Binary Searching, Search trees, Tutorials on searching algorithms	
18	1st week of November, 2017 (1-3) (3 contact hours)	Hash-Table methods, File Structures – External Storage Devices, Record Organization, File types and their structure.	

C & T : Chalk and Talk and   PPT : Power Point

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Assessment – 1 (1st Unit) (Objective type)	4th week of July , 2017	1 Hour	10
2.	Assessment – 2 (IInd Unit) (Written test)	5th week of August, 2017	1 Hour	15
3.	Assessment – 3 (III rd Unit) (Written test)	3rd week of September, 2017	1 Hour	15
4.	Assessment – 4 (1st Unit) (Objective type)	1st week of October, 2017	1 Hour	10
5	Assessment – 5 (Practicals)	3rd week of October 2017	2 Hours	20
CPA	Compensatrion Assessment (first 4 units) (Written test)	4th week of October, 2017	1 Hour	15
6.	Assessment – 6 **Final Assessment** (All units) (Written test)	Date decided by Class committee / Dean office	2 Hours	30

Note:

1. Attending all the assessments (except CPA) are **MANDATORY** for every student.

2. If any student is not able to attend Assessment 2 or 3 due to genuine reasons, student is permitted to attend the compensation assessment (CPA) with 15 % weightage (15 marks).

3. At any case, CPA will not be considered as an improvement test.

4. Relative grading will be based on the clusters (range) of the total marks (all the Assessments i.e. from 1 to 6, put together for each student) scored for grading by adopting Gap theory / Normalized curve. Letter grades, minimum pass marks and the corresponding grade points will be as per institute norms.

5. Suggestion (if any) from Class Committee / Office of the Dean (Academic) on the assessment / grading will be honoured with intimation to the students.

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

1. Jean Paul Tremblay and Paul.G.Sorenson, 'An Introduction to Data Structures with Applications', Tata McGraw Hill, 2nd Edition, 2008.
2. Debasis Samanta, 'Classic Data Structures', 2nd Edition, PHI learning, 2009.
3. Adam Drozdek- Duquesne, 'Data Structures and Algorithms in C++', Thomson Press, 3rd Edition, India Ltd.,2006.
4. Mark Allen Weiss, ' Data Structures and Algorithm Analysis in C++', Pearson, 4th Edition, 2013.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)
Feedback from the students during class committee meetings Anonymous feedback through questionnaire
COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through their webmail.
2. Queries (if required) may be emailed to me / contact me during 4.00 pm to 5.00 pm on Monday and Friday with prior intimation for any clarifications.

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum 75 % physical attendance in these contact hours to attend the end semester examination.

2. Any student, who fails to maintain 75% attendance needs to appear for the compensation assessemnt (CPA). Student who scores more than 60 % marks in the CPA will be eligible for attending the end semester examination.

3. Students not having 75% minimum attendance at the end of the semester and also fail in CPA (scoring less than 60%) will have to RE DO the course.
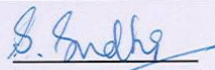
ACADEMIC HONESTY & PLAGIARISM

1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.
2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD for necessary action.
5. Students who honestly produce ORIGINAL and OUTSTANDING WORK will be REWARDED.
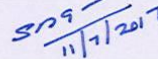
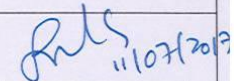| ADDITIONAL COURSE INFORMATION |
|---|
| Tutorials can be based on either C or C++. |
| FOR APPROVAL |

Course Faculty	CC-Chairperson	HOD