



Department of Computer Science and Engineering		LP: CS16202 Rev. No: 00 Date: 06-01-2017
B.E/B.Tech/M.E/M.Tech : CS/IT	Regulation:2016	
PG Specialisation : _		
Sub. Code / Sub. Name : CS16202 / Programming and Data Structures I		
Unit : I		

**Unit Syllabus:**

**C PROGRAMMING FUNDAMENTALS- A REVIEW**

Conditional statements – Control statements – Functions – Arrays – Preprocessor - Pointers - Variation in pointer declarations – Function Pointers – Function with Variable number of arguments

**Objective:**

To introduce the basics of C programming language

Session No *	Topics to be covered	Ref	Teaching Aids
1	Conditional and Control statements Statements and Blocks, if-else, else-if, switch	T1 – Ch.3; Pg. 55-60 R4– Ch.6; Pg. 60-87 R2– Ch.1;Pg.26-33	BB/PPT
2	Conditional and Control statements while, for, do-while, break and continue, goto and labels	T1 – Ch.3; Pg. 60-66 R4– Ch.5; Pg. 37-57 R2– Ch.1;Pg.37-59	BB/PPT
3	Functions Basics, Functions returning values, External Variables, Scope rules	T1 – Ch.4; Pg. 55-81 R4– Ch.8; Pg. 113-130 R2– Ch.2; Pg.67-83	BB/PPT
4	Functions Header file, Static variables, Register variables, Block Structure, Initialization, Recursion	T1 – Ch.4; Pg. 81-88 R4– Ch.8; Pg.144-154 R2– Ch.1;Pg.7-8 R2– Ch.2;Pg.82-92	BB/PPT
5	Arrays One Dimensional Arrays, Two Dimensional Arrays, Multi Dimensional Arrays	T1 – Ch.5; Pg. 110-112 R4– Ch.7;Pg. 90-110 R2– Ch.5;Pg.133-188	BB/PPT
6	Preprocessor C Preprocessor Directives, #define Statement, #include Statement, Conditional Compilation	T1 – Ch.4; Pg. 88-92 R4– Ch.13; Pg. 295-314	BB/PPT
7	Pointers Pointers and Addresses. Pointers and Arrays, Address Arithmetic	T1 – Ch.5;Pg. 93-103 R4–Ch.11; Pg.227-233,252-267 R2– Ch.3;Pg.97-106	BB/PPT
8	Pointers Pointer Arrays, Pointers to Pointers, Initialization of Pointer Arrays	T1 – Ch.5; Pg. 107-110 R4–Ch.11;Pg.233-252,267-270 R2– Ch.3;Pg.106-110	BB/PPT
9	Variation in pointer declarations Complication Declaration, Function Pointers Pointer to Functions	T1 – Ch.5; Pg. 122-126 R4– Ch.11;Pg. 246-252 R2– Ch.3;Pg.110-111	BB/PPT
10	Function with Variable number of arguments Command Line Arguments, Pointer and Function Arguments	T1 – Ch.5; Pg. 114-121 R4–Ch.17; Pg.364-368	BB/PPT
11	Function with Variable number of arguments Character Pointers and Functions	T1 – Ch.5; Pg.104-107 R4–Ch.11; Pg.230-233	BB/PPT
Content beyond syllabus covered (if any):-----			

\* Session duration: 50 minutes



**Sub. Code / Sub. Name:** CS16202 / Programming and Data Structures I  
**Unit :** II

**Unit Syllabus :****C PROGRAMMING ADVANCED FEATURES**

Structures and Unions - File handling concepts - File read - write - binary and Stdio - File Manipulations

**Objective:**

To introduce the advanced features of C programming language.

Session No *	Topics to be covered	Ref	Teaching Aids
12	<b>Structures</b> Basics of Structures, Structures and Functions, Array of Structures	T1 - Ch.6; Pg. 127-136 R4- Ch.9;Pg. 158-184 R2- Ch7;Pg.240-251	BB/PPT
13	<b>Structures</b> Pointers to Structures	T1 - Ch.6; Pg. 136-143 R4- Ch.11;Pg.233-237	BB/PPT
14	<b>Structures</b> Self Referential Structures ,table lookup, typedef	T1 - Ch.6; Pg. 143-147 R4- Ch.11;Pg. 237-246, R4- Ch.14;Pg.318-320 R2- Ch7;Pg.263	BB/PPT
15	<b>Unions</b> Basics of Unions, Bit Fields	T1 - Ch.6;Pg. 147-150 R4-Ch.17;Pg.360-362, R4- Ch.12;Pg.287-292	BB/PPT
16	<b>File Handling Concepts</b> Redirecting I/O to a File, End of File	T1 - Ch.7;Pg. 151-159 R4- Ch.16;Pg. 333-348	BB/PPT
17	<b>File Manipulations</b> fopen, fclose functions	T1 - Ch.7; Pg. 160-162 R4- Ch.16;Pg. 348-352	BB/PPT
18	<b>File Manipulations</b> stdin, stdout, stderr, exit functions	T1 - Ch.7; Pg. 161,163-164 R4- Ch.16;Pg. 353-355	BB/PPT
19	<b>File Manipulations</b> Renaming and Removing Files	T1 - Appendix B;Pg.242 <a href="http://www.tutorialspoint.com/c_standard_library/c_function_rename.htm">http://www.tutorialspoint.com/c_standard_library/c_function_rename.htm</a> <a href="http://www.tutorialspoint.com/c_standard_library/c_function_remove.htm">http://www.tutorialspoint.com/c_standard_library/c_function_remove.htm</a>	BB/PPT
20	<b>File read - write - binary and Stdio</b> fprintf, fscanf, fgets, fputs functions	T1 -Appendix B ;Pg.247 R4- Ch.16;Pg. 352-353	BB/PPT
<b>Content beyond syllabus covered (if any):</b> File Access Methods - Sequential and Random Access Methods			

\* Session duration: 50 mins



Sub. Code / Sub. Name: CS16202 / Programming and Data Structures I

Unit : III

**Unit Syllabus :**

**LINEAR DATA STRUCTURES – LIST**

Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation – singly linked lists- circularly linked lists- doubly-linked lists – applications of lists – Polynomial Manipulation – All operation (Insertion, Deletion, Merge, Traversal)

**Objective:**

To introduce the concept of List ADT and its applications.

Session No *	Topics to be covered	Ref	Teaching Aids
21	<b>Abstract Data Types (ADTs)</b> Introduction	T2- Ch.3; Pg. 57-58 R3- Ch1;Pg. 24-28	BB/PPT
22	<b>List ADT</b> Array-based implementation, Linked list implementation	T2- Ch.3;Pg. 58-60 R1- Ch10;Pg. 204-208 R2- Ch8;Pg.274-278 R3- Ch2;Pg.51-57	BB/PPT
23	<b>Singly linked lists</b> Programming Details – Insertion	T2- Ch.3; Pg. 60-62,65 R1- Ch10;Pg.205-206 R2- Ch8;Pg.281-286 R3- Ch2;Pg.60	BB/PPT
24	<b>Singly linked lists</b> Programming Details – Deletion, Find Operations	T2- Ch.3;Pg. 62-64 R1- Ch10;Pg. 206-207 R2- Ch8;Pg.279,286-289 R3- Ch2;Pg. 60	BB/PPT
25	<b>Circularly linked lists</b> Implementation	T2- Ch.3; Pg. 68 R2- Ch8;Pg.302-307	BB/PPT
26	<b>Doubly-linked lists</b> Implementation	T2- Ch.3; Pg. 67-68 R2- Ch8;Pg.315-331 R3- Ch2;Pg.64-66	BB/PPT
27	<b>Applications of lists</b> Polynomial Manipulation – Insertion, Deletion	T2- Ch.3, Pg. 68-69	BB/PPT
28	<b>Applications of lists</b> Polynomial Manipulation – Merge, Traversal	T2- Ch.3; Pg. 69-70	BB/PPT
29	<b>Applications of lists</b> Radix Sort, Multilists	T2- Ch.3; Pg. 70-73 R1- Ch8;Pg. 170-173 R2- Ch14;Pg.599-603	BB/PPT
<b>Content beyond syllabus covered (if any):</b> Application of list- Sparse matrix, pattern matching			

\* Session duration: 50 mins



**Sub. Code / Sub\_Name:** CS16202 / Programming and Data Structures I

**Unit :** IV

**Unit Syllabus :**

**LINEAR DATA STRUCTURES – STACKS, QUEUES**

Stack ADT – Evaluating arithmetic expressions- other applications- Queue ADT – circular queue implementation – Double ended Queues – applications of queues

**Objective:**

To introduce Stack ADT and Queue ADT with their applications.

Session No *	Topics to be covered	Ref	Teaching Aids
30	<b>Stack ADT</b> Array Implementation of Stack	T2- Ch.3,Pg. 78,82-87 R1- Ch10;Pg. 200-201 R2- Ch9;Pg.351-356 R3- Ch2;Pg.67-78	BB/PPT
31	<b>Stack ADT</b> Linked Implementation of Stack	T2- Ch.3;Pg. 79-82 R2- Ch9;Pg.357-361	BB/PPT
32	Evaluating arithmetic expressions Evaluation of Postfix expression	T2- Ch.3;Pg. 88-90 R2- Ch9;Pg.370-372	BB/PPT
33	Evaluating arithmetic expressions Infix to Postfix Expression.	T2- Ch.3;Pg. 90-93 R2- Ch9;Pg.366-372	BB/PPT
34	<b>Applications</b> Balancing Symbols	T2- Ch.3; Pg. 87 <a href="http://www.cprograms.in/Maths/balanced-expression.html">http://www.cprograms.in/Maths/balanced-expression.html</a>	BB/PPT
35	<b>Applications</b> Function Calls	T2- Ch.3;Pg. 93-95 <a href="http://www.csee.umbc.edu/~chang/cs313.s02/stack.shtml">http://www.csee.umbc.edu/~chang/cs313.s02/stack.shtml</a>	BB/PPT
36	<b>Queue ADT</b> Circular array implementation of queue	T2- Ch.3; Pg. 95-100 R1- Ch10;Pg. 201-203 R2- Ch9;Pg.382-387 R3- Ch1;Pg.71-74	BB/PPT
37	<b>Double ended Queues</b>	R2- Ch9;Pg.392-397 <a href="https://en.wikipedia.org/wiki/Double-ended_queue">https://en.wikipedia.org/wiki/Double-ended_queue</a>	BB/PPT
38	<b>Applications of queues</b>	T2- Ch.3; Pg. 100 <a href="https://en.wikipedia.org/wiki/Double-ended_queue">https://en.wikipedia.org/wiki/Double-ended_queue</a>	BB/PPT
<b>Content beyond syllabus covered (if any):</b> Priority Queues			

\* Session duration: 50 mins



**Sub. Code / Sub. Name:** CS16202 / Programming and Data Structures I  
**Unit :** V

**Unit Syllabus :**

**SORTING, SEARCHING AND HASH TECHNIQUES**

Sorting algorithms: Insertion sort - Selection sort - Shell sort - Bubble sort - Quick sort - Merge sort - Radix sort – Searching: Linear search – Binary Search Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing

**Objective:**

To introduce the concepts of sorting, searching and hashing.

Session No *	Topics to be covered	Ref	Teaching Aids
39	<b>Sorting algorithms</b> Insertion sort, Selection sort	T2- Ch.7;Pg. 236-237 R1- Ch2;Pg. 15-19 R2- Ch14;Pg.586-588 R3- Ch8;Pg.270-271 R2- Ch14;Pg.588-591 R3- Ch8;Pg.271-274	BB/PPT
40	<b>Sorting algorithms</b> Shell sort, Bubble sort, Quick sort	T2- Ch 7, Pg. 238-242 R2- Ch14;Pg.606-608 R2- Ch14;Pg.581-586 <a href="http://www.programmingsimplified.com/c/source-code/c-program-bubble-sort">http://www.programmingsimplified.com/c/source-code/c-program-bubble-sort</a> T2- Ch.7, Pg. 251-263 R1- Ch7;Pg. 145-149 R2- Ch14;Pg.595-599 R3- Ch8;Pg.274-284	BB/PPT
41	Sorting algorithms Merge sort, Radix sort	T2- Ch.7;Pg. 246-251 R2- Ch14;Pg.591-595 T2- Ch.3, Pg. 70-73 R1- Ch8, Pg. 170-173 R2- Ch14;Pg.599-603 R3- Ch8;Pg.293-295	BB/PPT
42	<b>Searching</b> Linear search, Binary Search	R2-Ch5;Pg.155-160 <a href="http://www.programmingsimplified.com/c/source-code/c-program-linear-search">http://www.programmingsimplified.com/c/source-code/c-program-linear-search</a> <a href="http://www.programmingsimplified.com/c/source-code/c-program-binary-search">http://www.programmingsimplified.com/c/source-code/c-program-binary-search</a>	BB/PPT
43	<b>Hashing</b> Hash Functions, Separate Chaining	T2- Ch.5;Pg. 165-173 R2- Ch15;Pg.629-633	BB/PPT
44	<b>Open Addressing</b> Linear Probing, Quadratic Probing, Double Hashing	T2- Ch.5;Pg. 173-181 R2- Ch15;Pg.613-629	BB/PPT
45	<b>Rehashing, Extendible Hashing</b>	T2- Ch.5;Pg. 181-187 <a href="https://en.wikipedia.org/wiki/Extendible_hashing">https://en.wikipedia.org/wiki/Extendible_hashing</a>	BB/PPT
<b>Content beyond syllabus covered (if any):</b> Heap Sort, Perfect Hashing			

\* Session duration: 50 mins



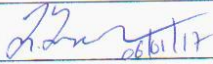

Sub Code / Sub Name: CS16202 / Programming and Data Structures I

**TEXT BOOKS:**

1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", 2<sup>nd</sup> Edition, Pearson Education, 1988.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2<sup>nd</sup> Edition, Pearson Education, 1997.

**REFERENCES:**

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", Second Edition, McGraw Hill, 2002.
2. Reema Thareja, "Data Structures Using C", Oxford University Press, 2011
3. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
4. Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Ed.,

	Prepared by	Approved by
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Date	06-01-2017	06-01-2017
Remarks *:		
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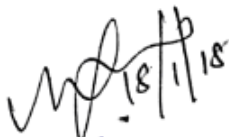
\* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD

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The same lesson plan will be followed for the AY 2017-18 even semester

  
1st/01/18

J. M. GNANASEKAR

  
18/1/18  
MOD-CS  
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