Fr. Conceicao Rodrigues College of Engineering
Father Agnel Ashram, Bandstand, Bandra-west, Mumbai-50
F.E. (semester II)

(2018-2019)

Course Outcomes & Assessment Plan

Course code: FEC205 (Structured Programming Approach) Credits :5

SYLLABUS:

1. Introduction to Computer, Algorithm and Flowchart

1.1 Basics of Computer:
Turing Model, Von Neumann Model, Basics of Positional Number System, Introduction to Operating System and component of an Operating System.
1.2 Algorithm & Flowchart:
Three construct of Algorithm and flowchart: Sequence, Decision (Selection) and Repetition

2. Fundamentals of C-Programming

2.1 Character Set, Identifiers and keywords, Data types, Constants, Variables.
2.2 Operators-Arithmetic, Relational and logical, Assignment, Unary, Conditional, Bitwise, Comma, other operators. Expression, statements, Library Functions, Preprocessor.
2.3 Data Input and Output – getchar( ), putchar( ), scanf( ), printf( ), gets( ), puts( ), Structure of C program .

3. Control Structures

3.1 Branching - If statement, If-else Statement, Multiway decision.
3.2 Looping – while , do-while, for
3.3 Nested control structure- Switch statement, Continue statement ,Break statement, Goto statement.

4. Functions and Parameter

4.1Function -Introduction of Function, Function Main, Defining a Function, Accessing a Function, Function Prototype, Passing Arguments to a Function, Recursion.
4.2 Storage Classes –Auto, Extern , Static, Register

5. Arrays, String Structure and Union

5.1 Array-Concepts, Declaration, Definition, Accessing array element, One-dimensional and Multidimensional array.
5.2 String- Basic of String, Array of String, Functions in String.h
5.3 Structure- Declaration, Initialization, structure within structure, Operation on structures, Array of Structure.
5.4 Union - Definition, Difference between structure and union, Operations on a union

6. Pointer and Files

6.1 Pointer :Introduction, Definition and uses of Pointers, Address Operator, Pointer Variables, Dereferencing Pointer, Void Pointer, Pointer Arithmetic, Pointers to Pointers, Pointers and Array, Passing Arrays to Function, Pointers and Function, Pointers and two dimensional Array, Array of Pointers, Dynamic Memory Allocation.
6.2 Files: Types of File, File operation- Opening, Closing, Creating, Reading, Processing File.

Text Books:

1. "MASTERING C" by K.R.Venugopal and SudeepR.Prasad , Tata McGraw-Hill Publications.
2. "A Computer Science –Structure Programming Approaches using C ", by BehrouzForouzan , Cengage Learning .
3. Schaum's outlines "Programming with C", by Byron S. Gottfried, Tata McGraw-Hill Publications.

Reference Books:

1. "Basics of Computer Science", by BehrouzForouzan , Cengage Learning .
2. "Programming Techniques through C", by M. G. Venkateshmurthy, Pearson Publication.
3. "Programming in ANSI C", by E. Balaguruswamy, Tata McGraw-Hill Education.
4. "Programming in C", by Pradeep Day and Manas Gosh, Oxford University Press.
5. "Let Us C", by YashwantKanetkar, BPB Publication.

COURSE OUTCOMES:

Upon completion of this course students will be able to:

FEC205.1 : Explain the fundamental concepts of C programming.

FEC205.2 : Illustrate and implement basic constructs of C.

FEC205.3 : Apply the concept of functions to solve a problem.

FEC205.4 : Demonstrate the use of derived data types in C.

CO ASSESSMENT TOOLS:

FEC205.1 : Explain the fundamental concepts of C programming.
Direct methods (80%): 0.2 Test1 + 0.2 Quiz + 0.1 Lab + 0.3 EndSem TH + 0.2 EndSem PR
Indirect Method (20%): Survey

FEC205.2 : Illustrate and implement basic constructs of C.
Direct methods (80%): 0.2 Test1 + 0.2 MochTest1 + 0.3 Lab +0 .2 Endsem TH + 0.1 EndSem PR
Indirect Method (20%): Survey

FEC205.3 : Apply the concept of functions to solve a problem.
Direct methods (80%): 0.2 Test2 + 0.3 Lab + 0.3 EndSem TH + 0.2 EndSem PR
Indirect Method (20%): Survey

FEC205.4 : Demonstrate the use of derived data types in C.
Direct methods (80%): 0.2 Test2 + 0.2 quiz + 0.3 Lab + 0.2 EndSem TH + 0.1 EndSem PR
Indirect Method (20%): Survey

Mapping of CO and PO/PSO

Relationship of course outcomes with program outcomes: Indicate 1 (low importance), 2 (Moderate Importance) or 3 (High Importance) in respective mapping cell.

	PO1 (Engg Know)	PO2 (Ana)	PO3 (De sign)	PO4 (inve stiga)	PO5 (tools)	PO6 (engg Soci)	PO7 (Env)	PO8 (Eth)	PO9 (ind Team)	PO10 (comm.)	PO11 (PM)	PO12 (life Long)
CPC802.1	3											
CPC802.2	3	1	1									
CPC802.3	3	1	1									
CPC802.4	3	1	1									
Course To PO												

CO	PSO1	PSO2
CPC802.1	3	
CPC802.2	3	
CPC802.3	3	
CPC802.4	3	
Course to PSO		

Justification:

PO1:

CPC802.1, CPC802.2 CPC802.3 and CPC802.4 are mapped to PO1 because engineering graduates will be able to apply the fundamental knowledge of C programming to solve complex engineering problems.

PO2:

CPC802.2, CPC802.3 and CPC802.4 are mapped to PO2 because students first formulate and then analyse the problem to be solved.

PO3:

CPC802.2, CPC802.3 and CPC802.4 are mapped to PO3 because students design flowchart and algorithms.

PSO1:

All COs are mapped to PSO1 because the graduates will be able to apply fundamental knowledge of C programmimg to provide computer base solution to real world problems.

LABORATORY PLAN

Week No.	Session No.	Topic	CO mapping	Planned date	Actual Date (batch C)	Content Delivery Method/Learning Activities
1	1 (T)	1. Fahrenheit and Celsius. 2. Gross salary. 3. Sum of three digit nos. 4. Swapping two nos. 5. A divisible by B using ternary op. 6. Largest of three using		3th week of Jan	18/1/19	Video/ slides/ chalk board

		ternary.				
	2 (L)	Lab experiments: Exp1 :Gross salary Exp2: Largest of three nos. Using ternary operator	CO1	3th week of Jan		Lab Experiment
2	1 (T)	1. Roots of Quadratic equation 2. Leap year 3. Largest of three nos. using nested if ..else 4. Type of triangle using else if ladder 5. Electricity Bill using if else if ladder 6. Vowels using switch case		4th week of Jan	25/1/19	slides/ chalk board
	2 (L)	Lab experiments: Exp3: Roots of Quadratic equation Exp 4:Grades using if else if ladder Exp 5: Calculator using switch	CO2	4th week of Jan		Lab Experiment
3	1 (T)	1. Factorial using for loop 2. A ^B using for 3. Fibonacci series using for 4. Series: 1+ 1/3+ 1/5…. 5. Series: 1 - 1/3+ 1/5…… 6. Series: 1- ½! + 1/3! – 1/4!		1st week of Feb	1/2/19	slides/ chalk board
	2 (L)	Lab experiments: Exp 6:Cosine series Exp 7:GCD using Euclid's algorithm using do…while loops Exp 8: A AB ABC	CO2	1st week of Feb		Lab Experiment
4	1 (T)	Patterns		2rd week of Feb	8/2/19	slides/ chalk board
	2 (T)	1. Sum of digits of a number 2. Reversing a number 3. Armstrong number 4. Binary to Dec 5. Dec to Binary 6. nPr and nCr		2rd week of Feb	22/2/19	Lab Experiment
5	1 (L)	Exp 9:Diamond pattern Exp 10: Armstrong nos. from 1 to 500 Exp 11:Prime nos. from 1 to 50	CO2	1st week of March		Lab Experiment
	2 (L)	Lab Experiments: Mocktest1 (1 hour) Exp 12: nPr and nCr using functions Exp 13: Swapping two nos.	MT-CO2 (Exp12,Exp13) CO3	1st week of March		Lab Experiment
6	1 (T)	1. Fibonacci using		2rd week	1/3/19	Slides/ chalk

		recursion 2. X^Y using recursion 3. GCD using recursion 4. Reversing a number using recursion 5. Printing binary form of a decimal no. using recursion 6. Maximum of an array 7. Sorting an array using bubble sort		of March		board
	2 (L)	Lab Experiments: Exp 14:Fibonacci using recursion Exp 15: X^Y using recursion Exp 16: Bubble sort Exp 17: Merge two array into a single array	(Exp14,Exp15) CO3, (Exp16) CO4	2rd week of March		Lab Experiment
7	1 (T)	1. Reversing an array 2. Binary search 3. Clockwise rotation (optional) 4. Sum of each row and column of a matrix 5. Transpose of a matrix 6. Symmetric Matrix		3rd week of March	8/3/19	slides/ chalk board
	3 (L)	Lab Experiments: Exp 18:Transpose of a matrix Exp 19:Multiplication of matrix	CO4	3rd week of March		Lab Experiment
8	1 (T)	Strings: 1. Convert first letter of every word into uppercase 2. String copy without using library functions 3. Returning average of an array by passing array to fun 4. Reverse a string by passing string to function		4th week of March	29/3/19	slides/ chalk board
	2 (L)	Lab Experiments: Exp 20:String is Palindrome or not and User defined function to concatenate two strings Exp 21: WAP to find trace and norm of square matrix Exp 22: Addition of two matrices by passing Matrices to function	(Exp 19)-CO4 (Exp 20, Exp 21) - CO3	4th week of March		Lab Experiment
9	1 (T)	1. Printing details of the patients with a given decease using structure. 2. Adding two complex numbers using structure.		1st week of April	5/4/19	Video/slides/ chalk board

		3. One program to clear basics of pointer (optional)				
	(L)	**Lab Experiments:** **Exp 23: Sorting an array of employees using structures** **Exp 24: Reversing an array using pointers**	**CO4**	**1st week of April**		**Lab Experiment**

LECTURE WISE PLAN:

Lecture No.	Topic	Programs to be covered	Planned Date	Actual date
1	Turing Model, Von Neumann Model, Basics of Positional Number System, Introduction to Operating System and component of an Operating System.	**-**	**1/1/19**	**1/1/19**
2	Algorithm & Flowchart	**-**	**2/1/19**	**2/1/19**
3	Character Set, Identifiers and keywords, Data types, Constants, Variables.	**-**	**3/1/19**	**3/1/19**
4	**Operators**-Arithmetic, Relational and logical, Assignment, Unary (++ , --)	1. Sum of two numbers 2. Area of a circle and rectangle	**8/1/19**	**4/1/19**
5	**Operatpors:** Conditional, Bitwise, Comma, other operators.Expression, statements, Preprocessor.		**9/1/19**	**8/1/19**
6	Library Functions, **Data Input and Output** – getchar( ), putchar( ), scanf( ), printf( ), gets( ), puts( ), Structure of C program .		**10/1/19**	**9/1/19**
7	**Branching** - If statement, If-else Statement, Multiway decision.	1. Odd even 2. Grade of a student	**15/1/19**	**9/1/19**
8	**Switch case**	Printing digits in words OR Display days of a week	**17/1/19**	**10/1/19**
9	**Looping** – while , do-while, for	For loop : 1. sum of n numbers 2. series : 1+1/2+1/3+…, 3. Printing 1 to n numbers in ascending and descending order.	**22/1/19**	**11/1/19**
10	**Looping** – while , do-while, for	While: 1. Counting number	**24/1/19**	**15/1/19**

		of digits 2. 2. GCD Using Dijkstras Do while: 1. Add integers till user types 'n'		
11	**Nested control structure**- Switch statement	1. Start pattern (Simple triangle), 2. Multiplication tables	**29/1/19**	**17/1/19**
12	Continue statement, Break statement, Goto statement.	1. One program for continue 2. Prime number using break	**7/2/19**	**22/1/19**
13	**Function** -Introduction of Function, Function Main, Defining a Function, Accessing a Function, Function Prototype,	Sum of two numbers or largest of three numbers.	**12/2/19**	**24/1/19**
14	Passing Arguments to a Function,	Swap (call by value, call by reference)	**19/2/19**	**29/1/19**
15	Recursion, **Storage Classes** –Auto , Extern , Static, Register	Sum and Factorial of n numbers using recursion	**21/2/19**	**7/2/19**
16	**Array**-Concepts, Declaration, Definition, Accessing array element.	Standard deviation	**26/2/19**	**7/2/19**
17	One-dimensional	Linear search OR max of 'n' numbers	**28/2/19**	**18/2/19**
18	Multidimensional array	Reading and writing 2D arrays	**5/3/19**	**26/2/19**
19	Basic of String, Functions in String.h	Length of string, Counting frequency of a character	**7/3/19**	**28/2/19**
20	Array of String , functions and strings	Searching a name in the list	**12/3/19**	**5/3/19**
21	Structure: Declaration, Initialization ,	Addition of two complex numbers. Reading and displaying Employee details	**14/3/19**	**7/3/19**
22	structure within structure, Operation on structures		**19/3/19**	**11/3/19**
23	Array of Structure. **4 Union** - Definition , Difference between structure and union , Operations on a union	Display all the details of Players, one program on Union	**26/3/19**	**12/3/19**
24	Introduction, Definition and uses of Pointers, Address Operator, Pointer Variables, Dereferencing Pointer, Void Pointer, Pointer Arithmetic	Traversing an array using pointers.	**28/3/19**	**14/3/19**

25	Pointers to Pointers, Pointers and Array, Passing Arrays to Function, Pointers and Function	Concatenating two strings using pointers, Returning an average of integer array using function and pointers	**2/4/19**	**26/3/19**
26	Pointers and two dimensional Array, Array of Pointers, Dynamic Memory Allocation.	Sum of matrix using pointers. One simple program for array of pointers	**4/4/19**	**28/3/19**
27	Types of File, File operation- Opening, Closing, Creating, Reading, and Processing File.	Reading and writing to the file	**Extra Lecture**	**2/4/19**