** E.G.S Pillay Engineering College – Nagapattinam**

 **Department of MCA**

 **Course plan – MC9212 /Problem Solving and Programming L T P C**

 **3 0 0 3**

**Subject Code/Name** : MC9212 /Problem Solving and Programming

 **Class** : I MCA **Batch**  : 2013-2016

 **Prescribed Hours** : 45 **Required Hours :** 45

 **Staff Name** : Mrs. A. Hema **Semester** : I

 **AIM**

 The aim of the course is the students to understand the basic concepts of computing and Programming Lanaguage.

 **Instructional Objectives:**

1. To familiarize the basic concepts of programming and its structures
2. To impart the fundamentals of programming paradigms and problem solving techniques
3. To impart the fundamentals of c programming
4. To train the students to develop programs using advanced features of c programming

**Instructional Outcome**:

 **At the end of the course the students will able to**

1. describe the basic concepts of programming language.
2. write the algorithm and pseudo code for the given problem.
3. Analyze sorting Algorithms.
4. develop programs using c fundamentals.
5. develop programs using advanced concepts in c.

**PREREQUISITE**:

* + 1. Basic knowledge of program in undergraduate level

**COURSE MAPPING WITH POs AND PEOs**

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| --- |
| **MC9212 /Problem Solving and Programming** |
| Course designed by | Anna University, Chennai (2009 Regulations) |
| PO mapping with Course outcome  | a | b | c | d | e | f | g | h | i | j | k | l |
| i | ii |  |  |  |  | iii | iv | v |  |  |  |
| PEO mapping with Course | Preparation | Core competence | Breadth | Professionalism | Learning Environment |
| x | x | x | - | - |

**DETAILED LESSON PLAN**:

|  |
| --- |
| **Unit 1: FUNDAMENTALS** Introduction to computing-Building blocks for simple programs-Problem analysis-Problem to Program-Documentation and testing-Decision Structure-Loop Structure-Programming style. |
| **Session No.** | **Topics to be covered** | **Text book** | **Chapter No. and** **Page No** | **Instruction delivery** | **Testing method** | **Instructional****Objective** | **Instructional** **outcome** |
| **Method** | **Level** |
| 1 | Introduction to computing | 1.Introduction to algorithms,McGraw Hill publishers,2002. | Chapter 1Pg (1-27) | Board and chalk | Understanding | Unit test | 1. To familiarize the basic concepts of programming and its structures  | 1.describe the basic concepts of programming language |
| 2 | Building blocks for simple programs | Chapter 1Pg (28-35) | Board and chalk | Understanding | Assignment |
| 3 | Problem analysis | Chapter 1Pg (36-37) | Understanding | Assignment |
| 4 | Problem to Program | Chapter 2Pg (38-41) | Board and chalk | Understanding | Unit test |
| 5 | Documentation  | Chapter 2Pg (41-42) | Board and chalk | Understanding | Unit test |
| 6 | testing | Chapter 2Pg (42-45) | Board and chalk | Understanding | Unit test |
| 7 | Decision Structure  | Chapter 2Pg (45-52) | PPT | Understanding | Assignment |
| 8 | Loop Structure | Chapter 2Pg (53-60) | Board and chalk | Understanding | Assignment |
| 9 | Programming style. | Chapter 2Pg (60-72) | PPT | Understanding | Unit test |
| **Unit 2:PROGRAMMING PARADIGMS** Procedural-Functional-Recursive-Rule-Based-Structured Programming |
| **Session No.** | **Topics to be covered** | **Text book** | **Chapter No. and** **Page No** | **Instruction delivary** | **Testing method** | **Instructional Objective** | **Instructional** **Outcome** |
| **Method** | **Level** |  |
| 10,11 | Procedural |  R2.Deitel and Deitel,”C How to Program”,Prentice Hall,1994. |  Chapter 2Pg (88-98) | Board and chalk | Understanding | Unit test | 2.To impart the fundamentals of programming paradigms and problem solving techniques  | 2. Write the algorithm and pseudo code for the given problem. |
| 12,13 | Functional | Chapter 2Pg (99-105) | PPT | Understanding | Unit test |
| 14,15 |  Recursive |  Chapter 4Pg (86) | PPT | Understanding | Unit test |
| 16,17 | Rule-Based |  Net References | Board and chalk | Understanding | Assignment |
| 18,19 | Structured Programming |  Net References | Board and chalk | Understanding | Assignment |
| **Unit 3: PROBLEM SOLVING TECHNIQUES** Programming life cycle phases-Problem Solving –Implementation-Maintenance-Pseudo code representation-Flow charts-Algorithms-Algorithm efficiency – Complexity of algorithms. |
| **Session No.** | **Topics to be covered** | **Text book** | **Chapter No. and** **Page No** | **Instruction delivery** | **Testing method** | **Instructional Objective** | **Instructional** **outcome** |
| **Method** | **level** |
| 20 | Programming life cycle phases |  | Chapter 3 Pg (92-96)  | Board & chalk | Understanding | Assignment | 2.To impart the fundamentals of programming paradigms and problem solving techniques  |  3.Analyze sorting Algorithms  |
| 21 | Problem Solving | Chapter 3Pg (97-107) | Board & chalk | Understanding | Unit test |
| 22 | Implementation | Chapter 3Pg (1) | Board & chalk | Analysis | Unit test |
| 23 | Maintenance | Chapter 3Pg (126) | Board & chalk | Understanding | Unit test |
| 24 | Pseudo code representation | Chapter3Pg (120-122) | PPT | Understanding | Unit test |
| 25 | Flow charts | Chapter 3Pg (112-119) | Board & chalk | Analysis | Assignment |
| 26 | Algorithms | Chapter 3Pg (127) | PPT | Understanding | Unit test |
| 27,28 | Algorithm efficiency | Chapter 3Pg (128-143) | PPT | Analysis | Assignment |
| 29 | – Complexity of algorithms. | Chapter 3Pg (144) | PPT | Understanding | Assignment |
| **Unit 4: C PROGRAMMING FUNDAMENTALS** **Structured program development-Data types-Operators & Expression-Control Flow-Arrays and Pointers – Functions-Input and output statements-Storage Classes.** |
| **Session No.** | **Topics to be covered** | **Text book** | **Chapter No. and** **Page No** | **Instruction delivery** | **Testing method** | **Instructional****Objective** | **Instructional** **outcome** |
| **method** | **level** |  |
| 30 | **Structured program development** |    | Chapter 7Pg (189-190) | PPT | Understanding | Unit test | 3.To impart the fundamentals of c programming | 4. develop programs using c fundamentals. |
| 31 | **Data types** | **Chapter 2****Pg (36**) | Board & chalk | Understanding | Unit test |
| 32,33 | **Operators**  | **Chapter 2****Pg (40-52**) | Board & chalk | Understanding | Assignment |
| 34 | **Expression** | **Chapter 2****Pg (51**) | Board & chalk | Understanding | Unit test |
| 35 | **Control Flow** | **Chapter 2****Pg (55-65**) | Board & chalk | Understanding | discussion |
| 36,37 | **Arrays**  | **Chapter 2****Pg (93-122**) | Board & chalk | Understanding | Unit test |
| 38 | **Pointers** | **Chapter 2****Pg (93-122**) | Board & chalk | Understanding | Unit test |
| 39 | **Functions** | . R1.Kernigan Brain W., and Dennis M.Ritchie,”The C Programming Language”,Seconde Edition, Prentice Hall,1988. | **Chapter 2****Pg (67-88**) | PPT | Understanding | Assignment |
| 40 | **Input and output statements** | **Chapter 2****Pg (151-166**) | Board & chalk | Understanding | Assignment |
| 41 | **Storage Classes.** | **Chapter 2****Pg (164**) | Board & chalk | Analysis | Unit test |
| **Unit 5: ADVANCED FEATURES****Strings – Recursion – Structures – Unions – bit Manipulations – enumerations – file processing –fundamental data strucutures.** |
| **Session No.** | **Topics to be covered** | **Text book** | **Chapter No. and** **Page No** | **Instruction delivery** | **Testing method** | **Instructional Objective** | **Instructional** **outcome** |
| **Method** | **Level** |
| 42 | **Strings** |  | **Chapter 8****Pg (318-350**) | PPT | Application | Unit test | 4.To train the students to develop programs using advanced features of c programming | 5.develop programs using advanced concepts in c.. |
| 43 | **Recursion** | **Chapter 5****Pg (170**) | PPT | Application | Assignment |
| 44 | **Structures** | **Chapter 10****Pg (393**) | PPT | Understanding | Unit test |
| 45 | **Unions** | **Chapter 10****Pg (403**) | Application | GD |
| 46 | **bit Manipulations** | **Chapter 10****Pg (405**) | PPT | Understanding | Unit test |
| 47 | **enumerations** | **Chapter 10****Pg (417**) | PPT | Application | discussion |
| 48,49 | **file processing** | **Chapter 10****Pg (430**) | Board & chalk | Understanding | Assignment discussionkfas  |
| 50 | **Fundamental data strucutures.** | **Chapter 10****Pg (466**) | Board & chalk | Understanding | Discussion |

**REFERENCES**

1. R1.Kernigan Brain W., and Dennis M.Ritchie,”The C Programming Language”,Second Edition, Prentice Hall,1988.

2. R2.Deitel and Deitel,”C How to Program”,Prentice Hall,1994.

3. R3.Coeman, Leiserson, Rivest, Stein “Introduction to algorithms”,McGraw Hill publishers,2002.

 **RESOURCES**:

1. http:// www.springeronline.com
2. http:// www. 4shared.com/office
3. http:// *www.globalspec.com*
4. http:// *www.abebooks.com*

**Gap Analysis**

The present syllabus succeeds in imparting in the basics of c language. But the application of c language in system oriented software are not covered.

**CONTENT BEYOND SYLLABUS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl.No** | **Topics** | **Hours** | **Method of Delivery** |
| 1 | The application of c language in system programming will be provided as content beyond the syllabus | 3 | PPT and LAB |

**Content beyond syllabus mapping with PEO and PO**

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| --- |
| **MC9212 / Problem Solving and Programming** |
| PO mapping with Content beyond syllabus | a | b | c | d | e | f | g | h | i | j | k | l |
|  |  |  |  |  |  |  | X |  |  |  |  |
| PEO mapping with Content beyond syllabus | Preparation | Core competence | Breadth | Professionalism | Learning Environment |
| X | X |  |  |  |

**Internal marks Assessment Method**

**Test : 10**

**Attendance : 5**

**Assignment : 5**

**Total : 20**

**ASSIGNMENTS**

|  |  |
| --- | --- |
| **A. No** | **Assignment Titles** |
| I(I UNIT) | 1.Write a detail note on top down design2.Explain in detail the various loop structures with suitable examples3.Give a brief notes on problem analysis4. Discuss the various decision structure used in problem solving with an example.5. What are the fundamental building blocks for implement of the concept of programming Explain in the detail? |
| II(II &III UNIT) | 1. Describe about the different stages of programming life cycle phase.2.Explain the efficiency and complexities of Algorithm3. Write detailed notes on structured programming and Rule-based Programming.4. What is meant by Recursion? Write a recursive algorithm to find the factorial of a number and explain its working.5. Explain about the capabilities and quality of good algorithm? |
| III(IV & V UNIT) | 1. Explain the different operators available in c
2. Discuss the formatted I/O statements with two examples each
3. Admission to a professional course is subject to the following conditions:
4. Marks in Mathematics >=60
5. Marks in physics >=50
6. Marks in chemistry >=40
7. Total in all the three subjects >=200 (or) total in maths and physics >=150 Given the marks of the three subjects, Write a program to process the applications to list the eligible candidates.
8. What are the categories of functions? Explain.
9. Write short notes on the following: Dynamic memory allocation, Sequential –Access file
 |
|  IV |  To develop the any game program using c  |

**TEST PORTION**

|  |  |  |  |
| --- | --- | --- | --- |
| **S. No** | **Name of the Test** | **Test Units** | **Examination Date** |
| 1 | Short Answer Test I | Unit I |  |
| 2 | Short Answer Test II | Unit 2 & 3 |  |
| 3 | Model Short Answer test | Full Portion |  |
| 4. | Cycle I | Unit 1  |  |
| 5. | Cycle II | Unit 2 & 3 |  |
| 6. | Model | Full Portion |   |

**Course incharge signature HOD Signature**

**ASSIGNMENTS**

|  |  |  |
| --- | --- | --- |
| **A. No** | **Assignment Titles** | **Assessment level** |
| I(I UNIT) | 1.Write a detail note on top down design2.Explain in detail the various loop structures with suitable examples3.Give a brief notes on problem analysis4. Discuss the various decision structure used in problem solving with an example.5. What are the fundamental building blocks for implement of the concept of programming Explain in the detail? | KnowledgeUnderstandingKnowledgeUnderstandingknowledge |
| II(II &III UNIT) |  1. Describe about the different stages of programming life cycle phase.2.Explain the efficiency and complexities of Algorithm3. Write detailed notes on structured programming and Rule-based Programming.4. What is meant by Recursion? Write a recursive algorithm to find the factorial of a number and explain its working.5. Explain about the capabilities and quality of good algorithm? | UnderstandingUnderstandingknowledgeknowledgeUnderstanding |
| III(IV & V UNIT) | 1.Explain the different operators available in c2.Discuss the formatted I/O statements with two examples each3.Admission to a professional course is subject to the following conditions:1. Marks in Mathematics >=60
2. Marks in physics >=50
3. Marks in chemistry >=40
4. Total in all the three subjects >=200 (or) total in maths and physics >=150 Given the marks of the three subjects,Write a program to process the applications to list the eligible candidates.

4. What are the categories of functions?Explain.5. Write short notes on the following: Dynamic memory allocation, Sequential –Access file  | UnderstandingUnderstandingApplicationKnowledgeKnowledge |
| IV | To develop any game program using c  | Application |