** 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**:

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| **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 1  Pg (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 1  Pg (28-35) | | | Board and chalk | | | Understanding | | | | | | | Assignment | | |
| 3 | Problem analysis | | Chapter 1  Pg (36-37) | | | Understanding | | | | | | | Assignment | | |
| 4 | Problem to Program | | Chapter 2  Pg (38-41) | | | Board and chalk | | | Understanding | | | | | | | Unit test | | |
| 5 | Documentation | | Chapter 2  Pg (41-42) | | | Board and chalk | | | Understanding | | | | | | | Unit test | | |
| 6 | testing | | Chapter 2  Pg (42-45) | | | Board and chalk | | | Understanding | | | | | | | Unit test | | |
| 7 | Decision Structure | | Chapter 2  Pg (45-52) | | | PPT | | | Understanding | | | | | | | Assignment | | |
| 8 | Loop Structure | | Chapter 2  Pg (53-60) | | | Board and chalk | | | Understanding | | | | | | | Assignment | | |
| 9 | Programming style. | | Chapter 2  Pg (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 2  Pg (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 2  Pg (99-105) | | | | PPT | | | Understanding | | | | | | Unit test | | | |
| 14,15 | Recursive | | Chapter 4  Pg (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 3  Pg (97-107) | | | | | | Board & chalk | | | Understanding | | | | | | Unit test | | |
| 22 | Implementation | Chapter 3  Pg (1) | | | | | | Board & chalk | | | Analysis | | | | | | Unit test | | |
| 23 | Maintenance | Chapter 3  Pg (126) | | | | | | Board & chalk | | | Understanding | | | | | | Unit test | | |
| 24 | Pseudo code representation | Chapter3  Pg (120-122) | | | | | | PPT | | | Understanding | | | | | | Unit test | | |
| 25 | Flow charts | Chapter 3  Pg (112-119) | | | | | | Board & chalk | | | Analysis | | | | | | Assignment | | |
| 26 | Algorithms | Chapter 3  Pg (127) | | | | | | PPT | | | Understanding | | | | | | Unit test | | |
| 27,28 | Algorithm efficiency | Chapter 3  Pg (128-143) | | | | | | PPT | | | Analysis | | | | | | Assignment | | |
| 29 | – Complexity of algorithms. | Chapter 3  Pg (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 7  Pg (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**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 design  2.Explain in detail the various loop structures with suitable examples  3.Give a brief notes on problem analysis  4. 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 Algorithm  3. 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 design  2.Explain in detail the various loop structures with suitable examples  3.Give a brief notes on problem analysis  4. 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? | Knowledge  Understanding  Knowledge  Understanding  knowledge |
| II  (II &III UNIT) | 1. Describe about the different stages of programming life cycle phase.  2.Explain the efficiency and complexities of Algorithm  3. 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? | Understanding  Understanding  knowledge  knowledge  Understanding |
| 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:   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 | Understanding  Understanding  Application  Knowledge  Knowledge |
| IV | To develop any game program using c | Application |