

### Lesson Plan

**Name of the Subject:** PROBLEM SOLVING AND COMPUTER PROGRAMMING

**Class & Semester:** I B.TECH (common to CSE, IT & CSSE)

| S. No.                               | Topic   | No. of periods required | Date(s) covered                  | No. of periods used | Book(s) followed | Remarks |
|--------------------------------------|---|-------------------------|----------------------------------|---------------------|------------------|---------|
| <b>Pre Requisites</b>                |   |                         |                                  |                     |                  |         |
| 1.                                   | Introduction to computer                                      | 1                       |                                  |                     | T1,R2,web        |         |
| 2.                                   | Computing Environments  | 1                       |                                  |                     | T1,R2,Web        |         |
| 3.                                   | Computer Languages  | 1                       |                                  |                     | T1,web           |         |
| 4.                                   | Creating and Running programs                                 | 1                       |                                  |                     | T1               |         |
| 5.                                   | Diagnostic Test   | 1                       |                                  |                     |                  |         |
| <b>Total no of periods required:</b> |   | 5                       | <b>Total no of periods used:</b> |                     |                  |         |
| <b>UNIT- I</b>                       |   |                         |                                  |                     |                  |         |
| 6.                                   | Introduction to Problem Solving.                              | 1                       |                                  |                     | T2,R1,R2         |         |
| 7.                                   | Algorithm and flowchart                                       | 2                       |                                  |                     | T2,R1            |         |
| 8.                                   | The problem solving aspect, top-down design                   | 1                       |                                  |                     | T2,R2,R1         |         |
| 9.                                   | Implementation of algorithms                                  | 1                       |                                  |                     | T1,R1            |         |
| 10.                                  | Program verification and efficiency of algorithms             | 2                       |                                  |                     | T1,R1            |         |
| 11.                                  | Introduction to the C Language                                | 1                       |                                  |                     | R1               |         |
| 12.                                  | C programs, identifiers, types, variables                     | 2                       |                                  |                     | T1,R1            |         |
| 13.                                  | Tutorial  | 1                       |                                  |                     |                  |         |
| 14.                                  | Types of operators, constants, coding constants               | 2                       |                                  |                     | T1,R1            |         |
| 15.                                  | Type casting and conversion, formatted input and output       | 2                       |                                  |                     | T1               |         |
| 16.                                  | Structure of a C program                                      | 1                       |                                  |                     | R2,T1,R1         |         |
| 17.                                  | Expressions, precedence and associativity                     | 1                       |                                  |                     | T1               |         |
| 18.                                  | Evaluation of expressions                                     | 1                       |                                  |                     | T1               |         |
| 19.                                  | Mixed type expressions  | 1                       |                                  |                     | T1               |         |
| 20.                                  | Tutorial  | 1                       |                                  |                     |                  |         |
| <b>Total no of periods required:</b> |   | 20                      | <b>Total no of periods used:</b> |                     |                  |         |
| <b>UNIT- II</b>                      |   |                         |                                  |                     |                  |         |
| 21.                                  | Selection - Making Decisions                                  | 1                       |                                  |                     | T1               |         |
| 22.                                  | Two way selection: if, if-else and nested if-else             | 1                       |                                  |                     | T1               |         |
| 23.                                  | Multi-way selection: if, else-if ladder and switch statements | 2                       |                                  |                     | T1               |         |
| 24.                                  | Repetition: concept of loop, pre-test and post-test loops     | 2                       |                                  |                     | T1,R1            |         |

|                                      |   |           |                                  |  |       |  |
|--------------------------------------|---|-----------|----------------------------------|--|-------|--|
| 25.                                  | Initialization and updating,  | 2         |                                  |  | T1    |  |
| 26.                                  | Event and counter controlled loops  | 1         |                                  |  | T1,R1 |  |
| 27.                                  | Loops in C, break, continue and goto statements                             | 2         |                                  |  | T1,R1 |  |
| 28.                                  | Tutorial  | 1         |                                  |  |       |  |
| 29.                                  | Fundamental Algorithms  | 1         |                                  |  | T2,T1 |  |
| 30.                                  | Exchanging the values of two variables, counting,                           | 1         |                                  |  | T2,T1 |  |
| 31.                                  | Summation of a set of numbers,  | 1         |                                  |  | T2,T1 |  |
| 32.                                  | Factorial computation,  | 1         |                                  |  | T2,T1 |  |
| 33.                                  | Generation of the Fibonacci sequence,                                       | 1         |                                  |  | T2,T1 |  |
| 34.                                  | Reversing the digits of an integer  | 1         |                                  |  | T2,T1 |  |
| 35.                                  | Number base conversion, character to number conversion                      | 1         |                                  |  | T2,T1 |  |
| 36.                                  | The smallest divisor of an integer, greatest common divisor of two integers | 1         |                                  |  | T2,T1 |  |
| 37.                                  | Generating prime numbers  | 1         |                                  |  | T2,T1 |  |
| 38.                                  | Tutorial  | 1         |                                  |  |       |  |
| 39.                                  | Formative Test and Remedial   | 2         |                                  |  |       |  |
| <b>Total no of periods required:</b> |   | <b>23</b> | <b>Total no of periods used:</b> |  |       |  |
| <b>UNIT- III</b>                     |   |           |                                  |  |       |  |
| 40.                                  | Arrays: Arrays in C   | 1         |                                  |  | T1,R1 |  |
| 41.                                  | One, two and multidimensional arrays  | 1         |                                  |  | T1    |  |
| 42.                                  | Linear search, binary search  | 2         |                                  |  | T1    |  |
| 43.                                  | Bubble sort   | 1         |                                  |  | T1    |  |
| 44.                                  | Selection sort and insertion sort   | 2         |                                  |  | T1    |  |
| 45.                                  | Strings: Concepts, strings in C   | 2         |                                  |  | R2,T1 |  |
| 46.                                  | String input/output functions   | 1         |                                  |  | R2,T1 |  |
| 47.                                  | Array of strings and string manipulation functions.                         | 2         |                                  |  | T1    |  |
| 48.                                  | Tutorial  | 1         |                                  |  |       |  |
| 49.                                  | Functions: Designing structured programs                                    | 1         |                                  |  | R1,R2 |  |
| 50.                                  | Functions in C, user- defined functions, types of functions,                | 2         |                                  |  | R1    |  |
| 51.                                  | Recursion and factorial using recursion                                     | 1         |                                  |  | R1    |  |
| 52.                                  | Standard library functions  | 1         |                                  |  | R1    |  |
| 53.                                  | Scope, storage classes and pre-processor directives                         | 1         |                                  |  | R1    |  |
| 54.                                  | Tutorial  | 1         |                                  |  |       |  |
| <b>Total no of periods required:</b> |   | <b>20</b> | <b>Total no of periods used:</b> |  |       |  |
| <b>UNIT- IV</b>                      |   |           |                                  |  |       |  |

|                                      |  |    |                                  |  |           |  |
|--------------------------------------|--|----|----------------------------------|--|-----------|--|
| 55.                                  | Derived Types: Type definition (typedef), enumerated types                               | 1  |                                  |  | T1,R1     |  |
| 56.                                  | Structure, accessing structures.   | 2  |                                  |  | R1,T1     |  |
| 57.                                  | Complex Structures: Nested structures  | 1  |                                  |  | R1,T1     |  |
| 58.                                  | Structures containing arrays, array of structures.                                       | 2  |                                  |  | R1        |  |
| 59.                                  | Tutorial   | 1  |                                  |  |           |  |
| 60.                                  | Structures and Functions   | 2  |                                  |  | ,R2,R1,T1 |  |
| 61.                                  | Sending individual members, sending the whole structure                                  | 1  |                                  |  | R1        |  |
| 62.                                  | Unions and bit fields.   | 1  |                                  |  | R1        |  |
| 63.                                  | Pointers: Concepts, pointer variables  | 2  |                                  |  | R1,T1     |  |
| 64.                                  | Accessing variables through pointers, pointer declaration and definition, initialization | 1  |                                  |  | R1        |  |
| 65.                                  | Pointer arithmetic, array of pointers  | 1  |                                  |  | R1,T1     |  |
| 66.                                  | Pointers to arrays, pointers and functions   | 2  |                                  |  | R1,T1     |  |
| 67.                                  | Tutorial   | 1  |                                  |  |           |  |
| 68.                                  | Call-by-value and call-by-reference, pointers to pointers                                | 2  |                                  |  | R1        |  |
| 69.                                  | Pointers to structures and memory allocation functions.                                  | 1  |                                  |  | R1        |  |
| 70.                                  | Formative Test and Remedial  | 2  |                                  |  |           |  |
| <b>Total no of periods required:</b> |  | 23 | <b>Total no of periods used:</b> |  |           |  |
| <b>UNIT- V</b>                       |  |    |                                  |  |           |  |
| 71.                                  | Files: Introduction and classification of files  | 2  |                                  |  | R1        |  |
| 72.                                  | Opening and closing of files   | 1  |                                  |  | R1        |  |
| 73.                                  | Read and write operations  | 2  |                                  |  | R1        |  |
| 74.                                  | Conversion of files  | 1  |                                  |  | R1        |  |
| 75.                                  | Command line arguments   | 2  |                                  |  | R1        |  |
| 76.                                  | Tutorial   | 1  |                                  |  |           |  |
| 77.                                  | Basic Data Structures: Overview of data structures                                       | 2  |                                  |  | R1        |  |
| 78.                                  | Implementation of stack operations (push, pop)   | 2  |                                  |  | R1        |  |
| 79.                                  | Implementation of linear queue operations (insertion, deletion) using arrays.            | 2  |                                  |  | R1        |  |
| 80.                                  | Implementation of Circular queue operations (insertion, deletion) using arrays           | 2  |                                  |  | R1        |  |
| <b>Total no of periods required:</b> |  | 17 | <b>Total no of periods used:</b> |  |           |  |
| <b>Topics Beyond Syllabus</b>        |  |    |                                  |  |           |  |
| 81.                                  | Additional Sorting Techniques  | 1  |                                  |  | T1,R1     |  |

|     |   |     |                                     |       |
|-----|---|-----|-------------------------------------|-------|
| 82. | Pragma Directives in C                  | 1   |                                     | T1,R1 |
|     | <b>Total no of periods required:</b>    | 2   | <b>Total no of periods used:</b>    |       |
|     | <b>Grand total of periods required:</b> | 110 | <b>Grand total of periods used:</b> |       |

**Text Books:**

T1: Behrouz A. Forouzan and Richard F. Gilberg, “A *Structured Programming Approach using C*,” Third Edition, Cengage Learning, NewDelhi, 2007

T2: R.G. Dromey, “*How to Solve it by Computer*,” First Edition, Pearson Education, NewDelhi, 1982

**Reference Books:**

R1: Pradip Dey and Manas Ghosh, “*Programming in C*,” Second Edition, Oxford University Press, NewDelhi, 2007

R2: Jeri R Hanly and Elliot B. Koffman, “*Problem Solving and Program design in C*,” Seventh Edition, Pearson Education, NewDelhi, 2014.

**Signature of the faculty Member**

**Signature of the HOD**