I B.Tech I Sem

15ACS03-PROBLEM SOLVING AND REASONING TECHNIQUES

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Course Objective: This course is aimed towardsinculcating programming logic development skills in a student.

UNIT I

Introduction to computer problemsolving: Introduction – The Problemsolving Aspect, Topdown Design, implementation ofAlgorithms, Program Verification , The Efficiency of Algorithms.

Fundamental algorithms: Exchanging the values of Two Variables – Counting, Summation of aset of Numbers, Factorial Computation, Generation ofthe Fibonacci sequence,Reversing the Digits of an Integer, Base Conversion, Character to Number Conversion.

UNIT II

Factoring methods: Finding the square Root of a number , The Smallest Divisor of an Integer , TheGreatest Common Divisor of Two Integers , Generating Prime Numbers , Computingthe Prime Factors of an Integer , Raisinga Number to a Large Power , Computing the nth Fibonacci Number.

UNIT III

Array techniques: Array Order Reversal, Array Counting or Histogramming, Finding the MaximumNumber in a Set , Removal of Duplicates from an Ordered Array , Partitioning anArray , Finding the kth Smallest Element , Longest Monotone Subsequence.

UNIT IV

Sorting and searching: The Two-way Merge, Sorting by Selection, Sorting by Exchange, Sorting byInsertion, Sorting by Diminishing Increment, Sorting by Partitioning, Binary Search,Hash Searching.

UNIT V

Text processing and pattern searching : Text Line Length Adjustment , Left and Right Justification of Text, KeywordSearching in Text , Text Line editing , Linear Pattern Search , Sub linear PatternSearch.

Books Recommended:
Essential Readings:
1. R.G.Dromey "How to Solve it by Computer", Pearson Education, India, 2007.

References:
2. Seymour Lipschutz, "Essentials computer Mathematics", Schaums' outlinesseries, Tata