GUJARAT UNIVERSITY

K. S. SCHOOL OF BUSINESS MANAGEMENT

M.Sc. IN COMPUTER APPLICATIONS AND INFORMATION TECHNOLOGY

[Five Years' (Full-time) Integrated Degree Course]

Sixth Semester M.Sc. (CA & IT)

KS_C_CC -364 System Software

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3 credit course

Objective:

Explain the concepts, structure and mechanisms of system software, Introduce design principles and implementation issues of System Software, Introduction of assembly language programming, Detailed study of Language processing, Compiler, Assembler, Parser, Scanner, Unix Device driver, Program compilation and Debugging

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UNIT I: **(20%)**

- **System Software** :- System Software, Goals of System Software, Overview of Language Processor, Fundamentals of language specification, Symbol Tables, Software Tools

UNIT II: **(20%)**

- **Assemblers and Device Driver**:- Elements of Assembly Language Programming, A Simple Assembly Scheme, Pass Structure of Assemblers, Design of a Two Pass Assembler, Device Driver, Character Driver, Block Driver, Driver Installation

UNIT III: **(20%)**

- **Macros and Macro Preprocessor and Interpreter:-** Macro Definition and Call, Macro Expansion, Nested Macro Calls, Advanced Macro Facilities, Activities and Data Structures Involved in Designing a Macro Processor, Interpreters: Use and Overview, Pure and Impure Interpreters

UNIT IV: **(20%)**

- **Scanning and Parsing and Compiler:-** Classification of Programming language, Introduction to Compilation, Scanning: Regular Expression, DFA, NFA, Parsing: Top Down , Top Down Without back tracking , Recursive Decent Parsing , First and Follow , LL(1), Bottom Up : Operator Precedence Grammar / Parser ,Language Processor development tools, Causes of a large semantic Gap, Binding and Binding Times, Data Structures used in Compilers, Scope Rules, Memory Allocation, Compilation of Expression and Control structure, Code Optimization

UNIT V: **(20%)**

- **Linkers & Loaders :-** Introduction to Linkers, Relocation and Linking Concepts, Design of a Linker, Self-Relocating Programs, Linking for Overlays, Introduction

to Loaders, Programs in Memory, Different Loading Schemes, Types of Loaders, Linking Loaders, Overlay, Binder, Dynamic Loader

Recommended Lecture Scheme: Approximately 45 hours of classroom teaching,

Recommended Practical Scheme: Applicable

Assignment: One assignment every month.

Text Books:

1. System Programming
   By D.M. Dhamdhare, Tata McGraw Hill
2. Unix Device Driver
   By George Pajere
3. Systems Programming
   By Srimanta Pal, Oxford University Press

Reference Books:

1. Compilers
   By Aho , Sethi & Ulman
2. Compiler Construction Principles & PracticePrinciples and Practice
   By Keneth Louden
3. System Software - An Introduction to Systems Programming
   By Leland L. Beck, Pearson Education Asia, 3rd Edition, 2000
4. System Software
   By Shantanu Chattopadhyay, Prentice-Hall India, 2007

Chapter -wise coverage of syllabus from Text book:

For Unit I of this syllabus
Text Book #1: **Ch-1, 2, 9 [1.1, 1.2, 2, 9]**
For Unit 2 of this syllabus
Text Book #1: **Ch-3 [3.1, 3.2, 3.3, 3.4]**
Text Book #2: **Ch-1, 2, 5, 13**
For Unit 3 of this syllabus
Text Book #1: **Ch-4, 8 [4, 8.1, 8.2]**
For Unit 4 of this syllabus
Text Book #1: **Ch-6, 7**
For Unit 5 of this syllabus
Text Book #1: **Ch- 5 [5.1, 5.2, 5.3, 5.4, 5.6, 5.7]**
Text Book #3: **Ch-14 [till 14.17]**