COURSE NAME : COMPUTER ENGINEERING GROUP

COURSE CODE : CO/CD

SEMESTER : SIXTH FOR CO AND SEVENTH FOR CD

SUBJECT TITLE : SYSTEM PROGRAMMING (ELECTIVE)

SUBJECT CODE : 9169

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
02	--	04	03	80	20	--	25#	25@	150

Rationale:

System Programming are the set of software's, which aide in effective communication with the system and makes the user interface more friendly. The main of system programming is to teach procedures for the design of system software like Assemblers, Loaders, and Compliers.

Present day computers cannot understand such language without the aid of system programs. System programs e.g. compliers, loaders, macro processors were developed to make computers better adapted to the needs of their users. Farther, people wanted more assistance in the mechanics of preparing their problems.

Objective:

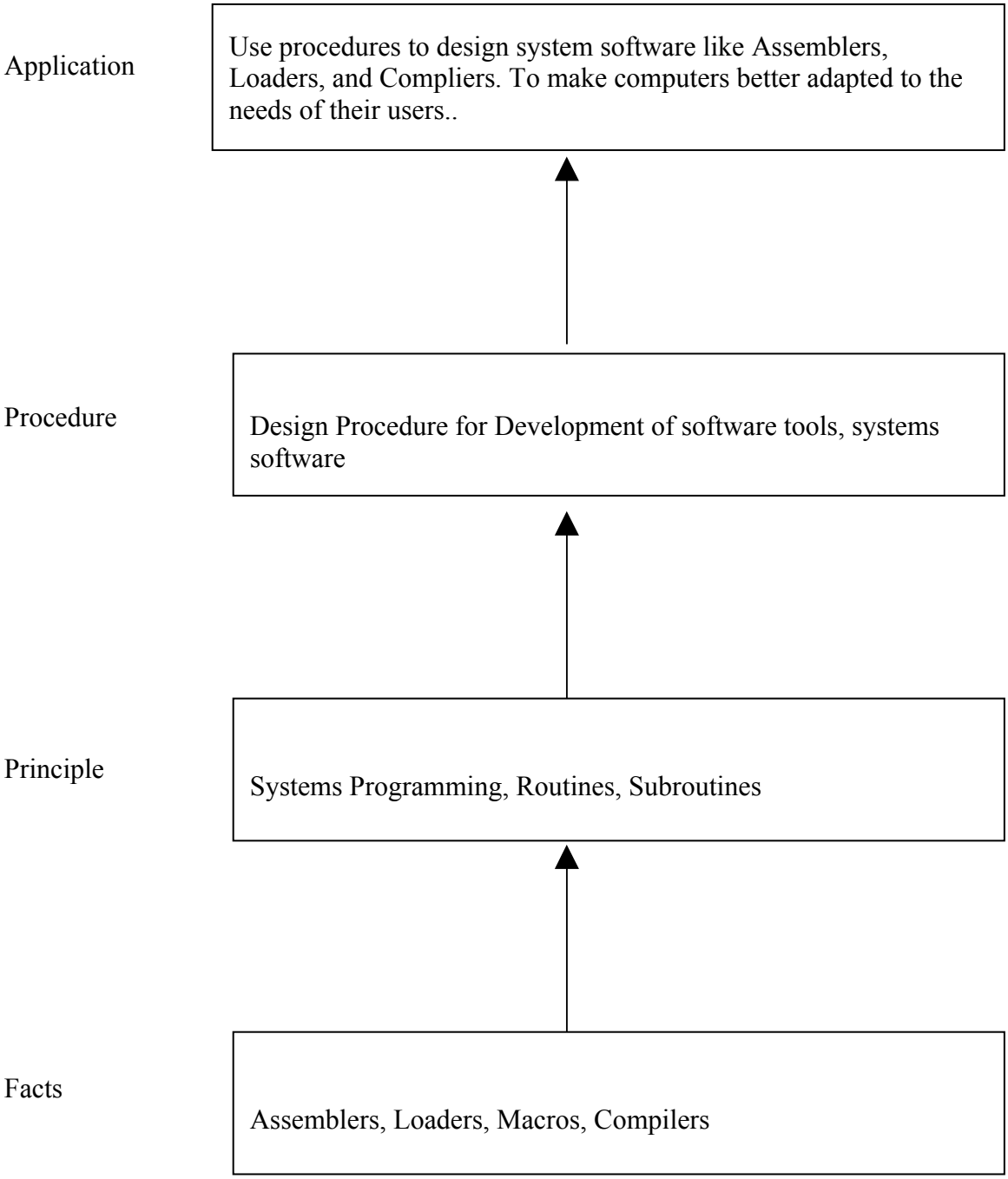
After studying the subject students will be able to

Understand various design aspect of the system software.

Develop software tools like editors and debuggers.

Develop various system software's.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Features of System Programming** 1.1 What is System Software 1.2 Components of System Software : Assemblers; Loaders; Macros; Compilers 1.3 Evolution of System Software 1.4 Foundations of system Programming.	**02**	**12**
02	**Assemblers** 2.1 General design procedure 2.2 Design of the assembler - Statement of the problem; Data Structure; Format of databases; Algorithm; Look for modularity. 2.3 Table Processing: Searching and Sorting- Linear Search; Binary Search Sorting: Interchange sort; Shell sort; Bucket sort; Radix exchange sort; Address calculation sort; Comparisons of sort; Hash or Random entry searching	**05**	**16**
0 3	**Macro Language and Macro Processors** 3.1 Macro Instructions 3.2 Features of a Macro facility - Macro Instruction Arguments; Conditional macro expansion; Macro call within Macros; Macro Instruction defining Macros. 3.3 Implementation - Implementation of restricted faculty : Two Pass Algorithm, A Single Pass Algorithm, Implementation of macro calls within Macros, Implementation within an assembler	**05**	**12**
04	**Loaders** 4.1 Loaders Schemes - "Compile and go" loaders; General Loader Schemes; Absolute Loaders; Subroutine linkages; Relocating loaders; Direct linking loaders; Other loaders scheme: Binders, Linking loaders Overlays, Dynamic Binders. 4.2 Design of Absolute loaders 4.3 Design of Direct Linking Loaders: Specification Problem; Specification of data structures; Format of database; Algorithm	**10**	**20**
05	**Compliers** 5.1 Statement of a problem - Recognizing basic elements; Recognizing Syntactic units and Interpreting meaning; Intermediate from: Arithmetic statements, Non-Arithmetic statement, Non-executable statements; Storage Allocation; Code Generation: Optimization(M/c independent), Optimization(M/c dependent); Assembly Phase; General Model of Compiler. 5.2 Phases of Compiler - Lexical Phase: Tasks, Databases, Algorithm; Syntax Phase: Databases, Algorithm; Interpretation Phase: Databases, Algorithm; Optimization: Databases, Algorithm; Storage Assignment: Databases, Algorithm; Code Generation: Databases, Algorithm; Assembly Phase: Databases, Algorithm; Passes of a Compiler	**10**	**20**
Total		**32**	**80**

Practical:

Skills to be developed:

1. Programming skills
2. Design of assemblers
3. Logical Thinking

List of Practical:

Sr. No.	Practical Name
1	Programming on sorting and searching techniques Liner search, Binary search, Interchange sort; Shell sort; Bucket sort; Radix exchange sort; Address calculation sort; Comparisons of sort; Hash or Random entry searching.
2	Design of a single pass assembler or two pass assembler.
3	Design of Macro Processor.
4	Design of Loaders.
5	Design of various phases of Compiler.

Learning Resources:

Books:

Sr. No.	Author	Title	Publication
1	John J. Donovan	System Programming	Tata McGraw-Hill Edition 2003
2	Mr. Dhamdhere	System Programming and Operating System	Tata McGraw-Hill Edition