

**Course No.: MCA-4T4**  
**Course Title: System Software Design**

**Unit I**

Introduction, Machine Structure , Evolution of the Components of programming system, assembler, loaders, macros, linkers, compilers, operating systems. Evolution of Operating Systems , Operating System User View Point , Functions , Batch Control Language , Facilities , General Machine Structure , General Approach to a New Machine , Machine Structure 360-370 : Memory , Registers , Data , Instructions , Special features, Machine Language. Assembly Language

**Unit II**

General Design Procedure , Assemblers, Design of an assembler, statement of the problem, data structure and format of databases, Algorithm, look for modularity, and review for searching and sorting techniques. Macros, Macros instructions, features , conditional macro instruction, macro calls within macros, Implementation of restricted facility, two pass algorithm, single pass algorithm, Implementation of macro calls within macros. Implementation within an assembler

**Unit III**

Loaders and Linkers, Loader Schemes , Compile and go loaders, general loader scheme, absolute loaders, subroutine linkages , relocating loaders , other loader schemes and binders. Linking loaders, overlays and dynamic binders, Design of an absolute loader , design of a direct linking loader.

**Unit IV**

Introduction to Programming languages : Importance of high level languages , features . Formal Systems and Programming Languages : An introduction , Use of formal systems in Programming languages , Formal specification , Formal grammars, Hierarchy of Languages, Backus – Naur Form – Backus Normal Form – BNF , Canonic Systems and Formal Systems.

Compilers, Statement of problem, phases of Compiler-Lexical phase, syntax phase Interpretation phase, optimization, storage assignment code generation and assembly phase, Passes of a compiler.

**Text Book** : John J. Donovan , “ Systems Programming” , Tata McGrawHill

**Reference Books:**

Leland L.Beck."System Software" 4<sup>th</sup> edition Pearson 1997

Barron.D.W."Assemblers and Loaders" Mc Donald and Javes 1978

Ullman.J.D."Fundamentals of Programming System" Addison and Wesley

D.M.Dhamdhere."System Programming and Operating Systems"2<sup>nd</sup> edition