

COURSE CODE	COURSE TITLE	L	T	P	C
1151CS105	SYSTEM SOFTWARE	3	0	0	3

Course Category: Program Core

A. Preamble:

This Course provides System software and machine architecture, a simple SIC assembler and algorithm types of assembler, Basic loader functions, Program Linking, Basic macro processor functions and Text editors.

B. Pre-requisites:

Sl. No	Course Code	Course Name
1	1151CS102	Data Structures

C. Related Courses:

Sl. No	Course Code	Course Name
1	1151CS110	Computer Organization and Architecture

D. Course Outcomes:

Students undergoing this course are able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Solve major tasks of the system software of a computer system, focusing on internal working of the hardware and software interface of a typical system.	K2
CO2	Discuss and explain the working of Assemblers	K2
CO3	Illustrate the working of system software such as compilers, linkers, loaders.	K3
CO4	Explain and demonstrate macroprocessors	K2
CO5	Demonstrate Editing and debugging Tools.	K3

E. Correlation of COs with POs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	H												M	M	L
CO2		H											M	M	
CO3		M											M	L	
CO4		M											L	M	
CO5					M								L	M	

H- Strong; M-Medium; L-Low

F. Course Content:

UNIT I INTRODUCTION

L – 8

System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

UNIT II ASSEMBLERS**L - 10**

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine independent assembler features - Literals – Symbol-defining statements – Expressions - Implementation example - MASM assembler.

UNIT III LOADERS AND LINKERS**L – 9**

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking.

UNIT IV MACRO PROCESSORS**L – 9**

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor.

UNIT V SYSTEM SOFTWARE TOOLS**L – 9**

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User-Interface Criteria.

TOTAL: 45 Periods**G. Learning Resources****i. TEXT BOOK:**

1. Leland L. Beck, “System Software – An Introduction to Systems Programming”, 3rd Edition, Pearson Education Asia, 2006.

ii. REFERENCES:

1. D. M. Dhamdhere, “Systems Programming and Operating Systems”, Second Revised Edition, Tata McGraw-Hill, 2000.
2. John J. Donovan “Systems Programming”, Tata McGraw-Hill Edition, 2000.
3. John R. Levine, “Linkers & Loaders” – Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, 2000.

iii ONLINE RESOURCES

1. www.edunotes.in/system-software-notes
2. www.faadooengineers.com/.../7960-System-Software-Ebook-Notes-pdf