	National Institute of Technology Meghalaya An Institute of National Importance	**CURRICULUM**

Programme	**Bachelor of Technology in Computer Science and Engineering**	Year of Regulation	**2020-21**
Department	**Computer Science and Engineering**	Semester	**VI**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
CS 328	**System Software**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives		Course Outcomes	
	To introduce the different system software for a general and simple computer architecture.	CO1	Student will be able to identify and distinguish among different system and application software.
	To implement different assemblers for a general and simple computer architecture.	CO2	Student will be able to design different types of assemblers for a simple microprocessor.
	To implement simple linker/loaders and macro for a general and simple computer architecture.	CO3	Student will be able to explain the requirements of linker/loader and also implement them for a simple system.
		CO4	Student will be able to explain the requirements of Macros and also implement them for a system.
		CO5	Student will be able to understand the working of different software like compiler, text editor and debuggers.

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**3**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**
2	CO2	**3**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**
3	CO3	**3**	**3**	**3**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**
4	CO4	**3**	**1**	**3**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**
5	CO5	**3**	**2**	**3**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**

SYLLABUS

No.	Content	Hours	COs
I	System and Application software, The Simplified Instruction Computer- SIC and SIC/XE,	**02**	**CO1**
II	Elements of Assembly Language Programming, Assembly Scheme, Machine-dependent Assembler Features, Pass Structure of Assembler, Design of Assembler -2 pass assemble for SIC, Data structure, Format of Database, Algorithm, Table processing: Searching and sorting, Machine-Independent Assembler Features, Multipass Assembler, A Single Pass Assembler for SIC.	**15**	**CO1, CO2**
III	Reallocation and Linking Concept, Design of Linker, Self Reallocation Programs, Loader, Absolute Loader, A Simple Bootstrap Loader, Reallocating Loader, Linking Loader, Design of a Loader.	**12**	**CO1, CO3**
IV	Macro Instructions, Features of Macro facility, Macro Instruction arguments, Generation of Unique labels, Conditional Macro Expansion, Keyword Macro parameters, Macro Instructions defining Macros, Recursive Macro Expansion, Macro Processor Algorithm and Data Structures.	**05**	**CO1, CO4**
V	Aspects of Compilation, Various phases of a compiler, Introduction to Language Processing Activity, Fundamental of Language Processing, Fundamental of Language Specification, Language Processor Development tool. Interactive Text Editor, Editing features, Type of Editor and user interface, Structure of a General Text Editor, Editor design and evaluation, Editors function in computing environments, Interactive Debugging System, Debugging Functions and Capabilities, Type of bugs, Debugging techniques, Debugging Tool, Command line Debugger, Types of analysis tool, Difficulties in Designing an Interactive Debugging System.	**05**	**CO1, CO5**
Total Hours		**39**	

Essential Readings:

1. Leland L. Beck , D. Manjula , " System Software -An Introduction to System Programming", 3rd ed., 1997, Addison Wesley.
2. M. Dhamdhere, " System Software and Operating System", 2nd ed. 1999, Tata McGraw-Hill.
3. Santanu chattopadhyay, "System software", 1st ed., 2007, PHI.

Supplementary Readings:

1. John J. Donovan, "System Programming", 1st ed., 2017, McGraw-Hill Education.
2. A.V. Aho, R. Sethi and J D. Ullman, "Compilers-Principles, Techniques and Tools", 2nd ed., 2006, Pearson Education.
3. J. Nithyashri, "System Software", 2nd ed., 2010, Tata McGraw Hill.