

Institute/Department	UNIVERSITY INSTITUTE OF ENGINEERING (UIE)	Program	Bachelor of Engineering - Computer Science & Engineering (CS201)
Master Subject Coordinator Name:	Monika	Master Subject Coordinator E-Code:	E9911
Course Name	SYSTEM PROGRAMMING	Course Code	20CST-315

Lecture	Tutorial	Practical	Self Study	Credit	Subject Type
3	0	0	0	3.0	T

Course Type	Course Category	Mode of Assessment	Mode of Delivery
Program Core	Graded (GR)	Theory Examination (ET)	Theory (TH)

Mission of the Department	MD1: To provide practical knowledge using state-of-the-art technological support for the experiential learning of our students. MD2: To provide an industry-recommended curriculum and transparent assessment for quality learning experiences. MD3: To create global linkages for interdisciplinary collaborative learning and research. MD4: To nurture an advanced learning platform for research and innovation for students' profound future growth. MD5: To inculcate leadership qualities and strong ethical values through value-based education.
Vision of the Department	"To be recognized as a leading Computer Science and Engineering department through effective teaching practices and excellence in research and innovation for creating competent professionals with ethics, values, and entrepreneurial attitude to deliver service to society and to meet the current industry standards at the global level."

Program Educational Objectives(PEOs)

PEO1	PEO1 Graduates of the Computer Science and Engineering will contribute to the Nation's growth through their ability to solve diverse and complex computer science and engineering problems across a broad range of application areas. (PEO1 is focused on Problem Solving)
PEO2	PEO2 Graduates of the Computer Science and Engineering will be successful professionals, designing and implementing Products & Services of global standards in the field of Computer Science & Engineering, becoming entrepreneurs, Pursuing higher studies & research. (PEO 2 is focused on Professional Success)
PEO3	PEO3 Graduates of the Computer Science and Engineering Program will be able to adapt to changing scenario of dynamic technology with an ability to solve larger societal problems using logical and flexible approach in decision making. (PEO 3 is focused on Attaining Flexibility and Adaptability)

Program Specific OutComes(PSOs)

PSO1	PSO1 Exhibit attitude for continuous learning and deliver efficient solutions for emerging challenges in the computation domain.
PSO2	PSO2 Apply standard software engineering principles to develop viable solutions for Information Technology Enabled Services (ITES).

Program OutComes(POs)

PO1	PO1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	PO2 Problem analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO3	PO3 Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal, and environmental considerations.
PO4	PO4 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	PO5 Modern tool usage: Create, select, and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	PO6 The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7	PO7 Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	PO8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	PO9 Individual or teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO11	PO11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	PO12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context to technological change.

Text Books					
Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Introduction to Systems Software	Dhamdhare, D.M.	second	Tata Mc-Graw Hill	1996
2	Systems Programming	Donovan J.J.	46/2009	Mc-Graw Hill	1972

Reference Books					
Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Principles of compiler Design	Aho A.V. and J.D. Ullman	second	Narosa Publishing House	2002

Course OutCome	
SrNo	OutCome
CO1	• To Understand different components of system software.
CO2	• To Understand the different phases and data structure used in assembly process by an assembler.
CO3	•To understand translation process(compilation)using different phases.
CO4	•To Analyze the role of linkers and loaders in executing the programs
CO5	•To Recognize operating system basic structure, parts and functions and the case study of editors.

Lecture Plan Preview-Theory						
Unit No	LectureNo	ChapterName	Topic	Text/ Reference Books	Pedagogical Tool**	Mapped with CO Numer (s)
1	1	Overview of System Software	Introduction, Software, Software Hierarchy, Systems Programming	T-Systems Programming	PPT,Video Lecture	CO1
1	2	Overview of System Software	Machine Structure, Interfaces, Address Space, Computer Languages	T-Systems Programming	PPT,Video Lecture	CO1
1	3	Overview of System Software	Tools, Life Cycle of a Source Program	T-Systems Programming	PPT,Video Lecture	CO1
1	4	Overview of System Software	Different Views on the Meaning of a Program, System Software Development	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO1

1	5	Overview of System Software	Recent Trends in Software Development, Levels of System Software	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO1
1	6	Assemblers	Elements of Assembly Language Programming, Design of the Assembler, Assembler Design Criteria	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	7	Assemblers	Types of Assemblers, Two-Pass Assemblers, One-Pass Assemblers	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	8	Assemblers	Single pass Assembler for Intel x86, Algorithm of Single Pass Assembler	T-Introduction to Systems Software, T-Systems Programming	Activity, Case Study, Flipperd Classes, Info graphics, Instructor Lead WorkShop, PPT, Reports, Video Lecture	CO2
1	9	Assemblers	Multi-Pass Assemblers, Advanced Assembly Process	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	10	Assemblers	Variants of Assemblers Design of two pass assembler	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	11	Macros	Macro and Macro Processors Introduction, Macro Definition and Call, Macro Expansion	T-Introduction to Systems Software, T-Systems Programming	Activity, Case Study, Flipperd Classes, Info graphics, Instructor Lead WorkShop, PPT, Reports, Simulation, Video Lecture	CO2
1	12	Macros	Nested Macro Calls, Advanced Macro Facilities, Design Of a Macro Preprocessor	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	13	Macros	Design of a Macro Assembler, Functions of a Macro Processor, Basic Tasks of a Macro Processor	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	14	Macros	Design Issues of Macro Processors, Features, Macro Processor Design Options	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
1	15	Macros	Two-Pass Macro Processors, One-Pass Macro Processors	T-Introduction to Systems Software, T-Systems Programming	PPT, Video Lecture	CO2
2	16	Overview of System Software	Doubt session	R-Principles of compiler Design	Activity, PPT, Video Lecture	CO1
2	17	Compilers	Introduction to various translators, Various phases of compiler	R-Principles of compiler Design	PPT, Video Lecture	CO3
2	18	Compilers	Introduction to Grammars and finite automata, Bootstrapping for compilers, Lexical Analysis	R-Principles of compiler Design	PPT, Video Lecture	CO3
2	19	Compilers	syntax analysis, Intermediate Code Generation	R-Principles of compiler Design	PPT, Video Lecture	CO3
2	20	Compilers	Code optimization techniques, Code generation	R-Principles of compiler Design	PPT, Video Lecture	CO3
2	21	Compilers	Case study :LEX and YACC, Design of a compiler in C++ as Prototype	R-Principles of compiler Design	PPT, Video Lecture	CO3
2	22	Compilers	Classification of Grammar, Ambiguity in Grammatic Specification	R-Principles of compiler Design	PPT, Video Lecture	CO3
2	23	Compilers	Scanning, Parsing	R-Principles of compiler Design	PPT, Video Lecture	CO3

2	24	Scanning and Parsing	Top Down Parsing	R-Principles of compiler Design	PPT,Video Lecture	CO3
2	25	Scanning and Parsing	Bottom up Parsing	R-Principles of compiler Design	PPT,Video Lecture	CO3
2	26	Scanning and Parsing	Language Processor Development Tools and practice of grammer	R-Principles of compiler Design	PPT,Video Lecture	CO3
2	27	Scanning and Parsing	LEX, YACC	R-Principles of compiler Design	Case Study,PPT,Video Lecture	CO3
2	28	Debuggers	Introduction to various debugging techniques	R-Principles of compiler Design	PPT,Video Lecture	CO3
2	29	Debuggers	Case Study: - Debugging in Turbo C++ IDE	R-Principles of compiler Design	Case Study,PPT,Video Lecture	CO3
2	30	Debuggers	Doubt Session	R-Principles of compiler Design	Activity,Reports,Video Lecture	CO3
3	31	Linkers and Loaders	Introduction, Relocation of Linking Concept, Design of a Linker	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	32	Linkers and Loaders	Self Relocating Programs, Linking in MSDOS	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	33	Linkers and Loaders	Linking of Overlay Structured Programs, Dynamic Linking	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO3
3	34	Linkers and Loaders	Linking of Overlay Structured Programs, Dynamic Linking	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	35	Linkers and Loaders	Loaders, Different Loading Schemes	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	36	Linkers and Loaders	Sequential and Direct Loaders, Compile-and-Go Loaders, General Loader Schemes	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	37	Linkers and Loaders	Absolute Loaders, Relocating Loaders, Practical Relocating Loaders	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	38	Linkers and Loaders	Linking Loaders, Relocating Linking Loaders, Linkers v/s Loaders	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO4
3	39	Editors	Line editor, full screen editor and multi window editor	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO5
3	40	Editors	Case study MS-Word	T-Introduction to Systems Softwa,T-Systems Programming	Case Study,PPT,Simulation,Video Lecture	CO5
3	41	Editors	DOS Editor	T-Introduction to Systems Softwa,T-Systems Programming	Case Study,PPT,Reports,Video Lecture	CO5
3	42	Editors	vi editor	T-Introduction to Systems Softwa,T-Systems Programming	Case Study,PPT,Reports,Simulation,Video Lecture	CO5
3	43	Operating System	Bootting techniques and sub-routines	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO5
3	44	Operating System	Design of kernel and various management for OS	T-Introduction to Systems Softwa,T-Systems Programming	PPT,Video Lecture	CO5
3	45	Operating System	Design of Shell and other utilities. ADVANCED TOPICS (BEYOND SYLLABUS) Macro and Macro Processors, Scanning and Parsing	T-Introduction to Systems Softwa,T-Systems Programming,R-Principles of compiler Design	Activity,PPT,Simulation,Video Lecture	CO5

Assessment Model			
Sr No	Assessment Name	Exam Name	Max Marks
1	20EU01	External Theory	60
2	20EU01	Assignment	10
3	20EU01	Attendance Marks	2
4	20EU01	Mid-Semester Test-1	40
5	20EU01	Quiz	4
6	20EU01	Surprise Test	12
7	20EU01	Mid-Semester Test-2	40

CO vs PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	2	NA	1	NA	NA	3	1	3	2	2	1	2
CO2	2	1	2	1	1	NA	NA	NA	2	3	2	2	2	3
CO3	2	1	1	1	1	NA	NA	NA	1	2	2	1	1	2
CO4	1	2	1	1	1	NA	NA	NA	3	2	3	2	2	3
CO5	3	2	1	2	1	NA	NA	3	2	2	2	2	2	2
Target	1.8	1.6	1.4	1.25	1	NA	NA	3	1.8	2.4	2.2	1.8	1.6	2.4

