

<b>Economics for Engineers</b>	<b>L</b>	<b>P</b>	<b>C</b>
	<b>2</b>		<b>2</b>

Discipline(s) / EAE / OAE	Semester	Group	Sub-group	Paper Code
All	5	HS/MS	HS	HS-301

**Marking Scheme:**

- Teachers Continuous Evaluation: 25 marks
- Term end Theory Examinations: 75 marks

**Instructions for paper setter:**

- There should be 9 questions in the term end examinations question paper.
- The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 15 marks.
- Apart from question 1 which is compulsory, rest of the paper shall consist of 4 units as per the syllabus. Every unit shall have two questions covering the corresponding unit of the syllabus. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain upto 5 sub-parts / sub-questions. Each Unit shall have a marks weightage of 15.
- The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook.
- The requirement of (scientific) calculators / log-tables / data – tables may be specified if required.

**Course Objectives :**

- To explain the basic micro and macro economics concepts.
- To analyze the theories of production, cost, profit and break even analysis
- To evaluate the different market structures and their implications for the behavior of the firm
- To apply the basics of national income accounting and business cycles to Indian economy

**Course Outcomes (CO)****CO 1** Analyze the theories of demand, supply, elasticity and consumer choice in the market.**CO 2** Analyze the theories of production, cost, profit and break even analysis**CO 3** Evaluate the different market structures and their implications for the behavior of the firm**CO 4** Apply the basics of national income accounting and business cycles to Indian economy**Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)**

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
<b>CO 1</b>	1	2	1	2	1	-	1	-	1	1	3	1
<b>CO 2</b>	1	2	1	2	1	-	1	-	1	1	3	1
<b>CO 3</b>	1	2	1	2	1	-	1	-	1	1	3	1
<b>CO 4</b>	1	2	1	2	1	-	1	-	1	1	3	1

**UNIT-I****Introduction:** Economics Definition, Basic economic problems, Resource constraints and welfare maximization. Micro and Macro economics. Production Possibility Curve. Circular flow of economic activities.**Basics of Demand, Supply and Equilibrium:** Demand side and supply side of the market. Factors affecting demand & supply. Elasticity of demand & supply – price, income and cross-price elasticity. Market equilibrium price.**UNIT-II****Theory of Consumer Choice:** theory of Utility and consumer's equilibrium. Indifference Curve analysis, Budget Constraints, Consumer Equilibrium.**Demand forecasting:** Regression Technique, Time-series, Smoothing Techniques: Exponential, Moving Averages Method

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**UNIT-III****Cost Theory and Analysis:** Nature and types of cost, Cost functions- short run and long run, Economies and diseconomies of scale**Market Structure:** Market structure and degree of competition. Perfect competition, Monopoly, Monopolistic competition, Oligopoly**UNIT - IV****National Income Accounting:** Overview of Macroeconomics, Basic concepts of National Income Accounting**Macro Economics Issues:** Introduction to Business Cycle, Inflation-causes, consequences and remedies: Monetary and Fiscal policy.**Textbook(s):**

- H.C. Petersen, W.C. Lewis, Managerial Economics, 4th ed., Pearson Education 2001.

**References:**

- S.K. Misra & V. K. Puri, Indian Economy, 38th ed., Himalaya Publishing House, 2020.
- D.N. Dwivedi, Managerial Economics, 8<sup>th</sup> Edition, Vikas Publishing house
- D. Salvatore, Managerial Economics in a Global Economy, 8th ed., Oxford University Press, 2015.
- S. Damodaran, Managerial Economics, 2nd ed., Oxford University Press, 2010.
- M. Hirschey, Managerial Economics, 12th ed., Cengage India, 2013.
- P.A. Samuelson, W.D. Nordhaus, S. Nordhaus, Economics, 18th ed., Tata Mc-Graw Hill, 2006.

<b>Compiler Design</b>			
<b>L</b>	<b>P</b>	<b>C</b>	
<b>3</b>		<b>3</b>	

Discipline(s) / EAE / OAE	Semester	Group	Sub-group	Paper Code
CSE/IT/CST/ITE	5	PC	PC	CIC-303

**Marking Scheme:**

- Teachers Continuous Evaluation: 25 marks
- Term end Theory Examinations: 75 marks

**Instructions for paper setter:**

- There should be 9 questions in the term end examinations question paper.
- The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 15 marks.
- Apart from question 1 which is compulsory, rest of the paper shall consist of 4 units as per the syllabus. Every unit shall have two questions covering the corresponding unit of the syllabus. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain upto 5 sub-parts / sub-questions. Each Unit shall have a marks weightage of 15.
- The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook.
- The requirement of (scientific) calculators / log-tables / data – tables may be specified if required.

**Course Objectives :**

- To introduce the major concept areas of language translation and **compiler design**.
- To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation, and use of symbol table.
- To extend the knowledge of parser by parsing LL parser and LR parser.
- To provide practical programming skills necessary for constructing a compiler.

**Course Outcomes (CO)**

- CO 1** Able to apply the knowledge of LEX tool & YACC tool to develop a scanner & parser.
- CO 2** Able to design & implement a software system for backend of the compiler.
- CO 3** Able to design syntax tree and intermediate code generator.
- CO 4** To understand the concept of symbol table and to use various code optimization techniques

**Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)**

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
<b>CO 1</b>	3	2	-	2	3	2	-	-	-	-	-	3
<b>CO 2</b>	3	2	-	2	3	2	-	-	-	-	-	3
<b>CO 3</b>	3	2	-	2	3	2	-	-	-	-	-	3
<b>CO 4</b>	3	2	-	2	3	2	-	-	-	-	-	3

**UNIT-I**

Compilers and translators, need of translators, structure of compiler: its different phases, compiler construction tools, Lexical analysis: Role of lexical analyzer, Input Buffering, A simple approach to the design of Lexical Analyzers, Specification and recognition of tokens, Finite automata, From regular expressions to automata, and vice versa, minimizing number of states of DFA, A language for specifying Lexical Analyzers, Design and implementation of lexical analyzer.

**UNIT-II**

The role of the parser, Context free grammars, Writing a grammar: Lexical versus Syntactic analysis, Eliminating ambiguity, Elimination of left recursion, Left factoring, Top Down Parsing: Recursive- Decent parsing, Non-recursive Predictive parsing, LL(1) grammars, Bottom Up Parsing: Shift Reduce Parsing, Operator precedence parsing, LR Parsing: SLR, LALR and Canonical LR parser, Parser Generators.

**UNIT-III**

Syntax Directed Translation: Syntax directed definitions, Evaluation orders for SDD's, construction of syntax

trees, syntax directed translation schemes, implementation of syntax directed translation, Intermediate Code Generation: Kinds of intermediate code: Postfix notation, Parse trees and syntax trees, Three-address code, quadruples and triples, Semantic Analysis: Types and Declarations, Translation of Expressions, Type checking.

**UNIT - IV**

Symbol Table: Symbol tables, its contents, Data Structure for Symbol Table: lists, trees, linked lists, hash tables, Error Detection and Recovery: Errors, lexical phase errors, syntactic phase errors, semantic errors, Error seen by each phase.

Code Optimization: The principal sources of optimizations, Loop optimization, Basic blocks and Flow Graphs, DAG representation of basic blocks, Code Generation: Issues in the design of code generation, A simple target machine mode, A Simple Code Generator, Peep-hole optimization, Register allocation and assignment.

**Textbook(s):**

- Alfred V. Aho, Monica S. Lam, Ravi Sethi and Jeffrey D. Ullman, "Compilers Principle, Techniques, and Tool", Pearson.
- Alfred V. Aho, Ravi Sethi and Jeffrey D. Ullman, "Compilers Principle, Techniques, and Tool", Addison Wesley.

**References:**

- Trembley and Sorenson, "Theory and Practice of Compiler Writing", McGraw Hill.
- Jhon R. Levine, Tony Mason and Doug Brown, —Lex & Yacc, O'Reilly.
- Dr. M. Joseph, "Elements **compiler Design**", University Science Press.

Operating Systems				L	P	C
				4		4

Discipline(s) / EAE / OAE	Semester	Group	Sub-group	Paper Code
CSE/IT/CST/ITE	5	PC	PC	CIC-305
OAE	7	CSE-OAE	CSE-OAE-4	OCSE-409

<b>Marking Scheme:</b>	
1. Teachers Continuous Evaluation: 25 marks	
2. Term end Theory Examinations: 75 marks	
<b>Instructions for paper setter:</b>	
1. There should be 9 questions in the term end examinations question paper.	
2. The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 15 marks.	
3. Apart from question 1 which is compulsory, rest of the paper shall consist of 4 units as per the syllabus. Every unit shall have two questions covering the corresponding unit of the syllabus. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain upto 5 sub-parts / sub-questions. Each Unit shall have a marks weightage of 15.	
4. The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook.	
5. The requirement of (scientific) calculators / log-tables / data – tables may be specified if required.	
<b>Course Objectives :</b>	
1.	To understand the basics of OS and their functions. To learn the scheduling policies of various operating systems.
2.	Learn memory management methods.
3.	To understand the characterisation of deadlock, system deadlock, preventing deadlock, avoiding deadlock and related concepts.
4.	To understand the meaning of a file, structure of the directories, file structure system and implementation, free-space management
<b>Course Outcomes (CO)</b>	
CO 1	Understand the role of operating system in a computing device, and Ability to understand paging and segmentation methods of memory binding and their pros & cons.
CO 2	Understand scheduling of process over a processor. Ability to use concepts of semaphore and its usage in process synchronization.
CO 3	Ability to synchronize programs and make the system deadlock free.
CO 4	Ability to understand file system like file access methods, directory structures, file space allocation in disk and free space management in disk. Ability to understand disk scheduling and disk recovery procedures.
<b>Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)</b>	
	PO01 PO02 PO03 PO04 PO05 PO06 PO07 PO08 PO09 PO10 PO11 PO12
CO 1	3 3 2 - 3 - - - - - - - -
CO 2	3 3 - - 2 - - - - - - - -
CO 3	3 2 3 - 2 - - - - - - - -
CO 4	3 3 - - 2 - - - - - - - -
<b>UNIT-I</b>	
Introduction: What is an Operating System, Simple Batch Systems, Multiprogrammed Batches systems, Time Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems, OS – A Resource Manager.	
Processes: Introduction, Process states, process management, Interrupts, Interprocess Communication	
Threads: Introduction, Thread states, Thread Operation, Threading Models. Processor Scheduling: Scheduling	

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levels, preemptive vs no preemptive scheduling, priorities, scheduling objective, scheduling criteria, scheduling algorithms, demand scheduling, real time scheduling.	[No. of hrs. 12]
<b>UNIT-II</b>	
Process Synchronization: Mutual exclusion, software solution to Mutual exclusion problem, hardware solution to Mutual exclusion problem, semaphores, Critical section problems. Case study on Dining philosopher problem, Barber shop problem etc.	
Memory Organization & Management: Memory Organization, Memory Hierarchy, Memory Management Strategies, Contiguous versus non- Contiguous memory allocation, Partition Management Techniques, Logical versus Physical Address space, swapping, Paging, Segmentation, Segmentation with Paging Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Thrashing, Demand Segmentation, and Overlay Concepts.	
	[No. of hrs. 13]
<b>UNIT-III</b>	
Deadlocks: examples of deadlock, resource concepts, necessary conditions for deadlock, deadlock solution, deadlock prevention, deadlock avoidance with Bankers algorithms, deadlock detection, deadlock recovery. Device Management: Disk Scheduling Strategies, Rotational Optimization, System Consideration, Caching and Buffering.	
	[No. of hrs. 13]
<b>UNIT - IV</b>	
File System: Introduction, File Organization, Logical File System, Physical File System, File Allocation strategy, Free Space Management, File Access Control, Data Access Techniques, Data Integrity Protection, Case study on file system viz FAT32, NTFS, Ext2/Ext3 etc.	
	[No. of hrs. 12]
<b>Textbook(s):</b>	
[T1] Deitel & Dietel, "Operating System", Pearson, 3 rd Ed., 2011	
[T2] Silberschatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001	
[T3] Madnick & Donovan, "Operating System", TMH, 1st Ed., 2001	
<b>References:</b>	
[R1] Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000	
[R2] Godbole, "Operating Systems", Tata McGraw Hill, 3rd edition, 2014	
[R3] Chauhan, "Principles of Operating Systems", Oxford Uni. Press, 2014	
[R4] Dhamdhere, "Operating Systems", Tata McGraw Hill, 3rd edition, 2012	
[R5] Loomis, "Data Management & File Structure", PHI, 2nd Ed.	

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<b>Computer Networks</b>	<b>L</b>	<b>P</b>	<b>C</b>
	<b>4</b>		<b>4</b>

Discipline(s) / EAE / OAE	Semester	Group	Sub-group	Paper Code
CSE/IT/CST/ITE	5	PC	PC	CIC-307
ICE	5	PC	PC	CIC-313

**Marking Scheme:**

- Teachers Continuous Evaluation: 25 marks
- Term end Theory Examinations: 75 marks

**Instructions for paper setter:**

- There should be 9 questions in the term end examinations question paper.
- The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 15 marks.
- Apart from question 1 which is compulsory, rest of the paper shall consist of 4 units as per the syllabus. Every unit shall have two questions covering the corresponding unit of the syllabus. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain upto 5 sub-parts / sub-questions. Each Unit shall have a marks weightage of 15.
- The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook.
- The requirement of (scientific) calculators / log-tables / data – tables may be specified if required.

**Course Objectives :**

- Build an understanding of the fundamental concepts of **computer networking**.
- Familiarize the student with the basic taxonomy and terminology of the **computer networking** area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in **computer networking**.
- Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

**Course Outcomes (CO)**

**CO 1** Independently understand basic **computer network** technology.

**CO 2** Understand and explain Data Communications System and its components.

**CO 3** Understand and implements the network topology and ip addressing, subnetting.

**CO 4** Enumerate the layers of the OSI model and TCP/IP.

**Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)**

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
<b>CO 1</b>	3	2	1	1	3	1	-	-	-	-	-	3
<b>CO 2</b>	3	2	1	1	3	1	-	-	-	-	-	3
<b>CO 3</b>	3	2	1	1	3	1	-	-	-	-	-	3
<b>CO 4</b>	3	2	1	1	3	1	-	-	-	-	-	3

**UNIT-I**

Data Communications: Components, Networks, The Internet, Protocols and Standards, Network Models: The OSI Model, TCP/IP Protocol Suite , A Comparison of the OSI and TCP/IP Reference Models, Addressing, Physical Layer: Analog and Digital Signals, Transmission modes, Transmission Media: Guided Media, Unguided Media, Review of Error Detection and Correction codes.

Switching: Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

**UNIT-II**

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Data Link Layer: Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ, Sliding window protocol, Go-Back-N ARQ, Selective Repeat ARQ, HDLC, Point-to –Point Access: PPP Point –to-Point Protocol, PPP Stack,  
Medium Access Sub layer: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANs and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.

**UNIT-III**

Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: ARP, IPv4, ICMP, IPv6 ad ICMPV6.

**UNIT - IV**

Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service. Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

**Textbook(s):**

- Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill.

**References:**

- A. S. Tannenbaum, D. Wetherall,, "**Computer Networks**", Prentice Hall, Pearson.
- Fred Halsall, "**Computer Networks**", Addison – Wesley.
- Tomasi, "Introduction To Data Communications & Networking", Pearson.

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Design and Analysis of Algorithm	L	P	C
	4		4

Discipline(s) / EAE / OAE	Semester	Group	Sub-group	Paper Code
CSE/IT/CST/ITE	5	PC	PC	CIC-311

**Marking Scheme:**

1. Teachers Continuous Evaluation: 25 marks
2. Term end Theory Examinations: 75 marks

**Instructions for paper setter:**

1. There should be 9 questions in the term end examinations question paper.
2. The first (1st) question should be compulsory and cover the entire syllabus. This question should be objective, single line answers or short answer type question of total 15 marks.
3. Apart from question 1 which is compulsory, rest of the paper shall consist of 4 units as per the syllabus. Every unit shall have two questions covering the corresponding unit of the syllabus. However, the student shall be asked to attempt only one of the two questions in the unit. Individual questions may contain upto 5 sub-parts / sub-questions. Each Unit shall have a marks weightage of 15.
4. The questions are to be framed keeping in view the learning outcomes of the course / paper. The standard / level of the questions to be asked should be at the level of the prescribed textbook.
5. The requirement of (scientific) calculators / log-tables / data – tables may be specified if required.

**Course Objectives :**

1. To introduce various designing techniques and methods for algorithms
2. Performance analysis of Algorithms using asymptotic and empirical approaches
3. Demonstrate a familiarity with major algorithms and data structures.
4. To give clear idea on algorithmic design paradigms like Divide-and-Conquer, Dynamic Programming, Greedy, Branch & Bound, Back tracking and string matching and network flow. .

**Course Outcomes (CO)**

- CO 1** To be able to analyse asymptotic runtime complexity of algorithms including formulating recurrence relations and divide and conquer designing method.
- CO 2** Describe the greedy paradigm and apply Greedy strategy for solving various problems.
- CO 3** Apply dynamic programming and Branch & Bound approach to solve suitable problems
- CO 4** Understand the concept of NP problems and string matching algorithm and various flow & sorting networks

**Course Outcomes (CO) to Programme Outcomes (PO) mapping (scale 1: low, 2: Medium, 3: High)**

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	PO10	PO11	PO12
<b>CO 1</b>	1	1	1	1	1	2	2	2	2	1	1	1
<b>CO 2</b>	2	2	3	1	2	3	1	2	3	1	2	2
<b>CO 3</b>	2	2	1	1	2	3	3	2	1	3	1	2
<b>CO 4</b>	3	2	2	3	2	1	3	2	1	1	2	3

**UNIT-I**

Asymptotic notations for time and space complexity, Methods for solving Recurrence relations, Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

**Divide and Conquer:** General method, binary search, merge sort, Quick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.

**UNIT-II**

**Greedy Method:** General method, knapsack problem, Huffman Codes, job sequencing with deadlines, minimum spanning trees, single source paths and analysis of these problems.

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**Back Tracking:** General method, 8 queen's problem, graph colouring, Hamiltonian cycles, analysis of these problems.

**UNIT-III**

**Dynamic Programming:** Ingredients of Dynamic Programming. Matrix Chain Multiplication, Longest common subsequence and optimal binary search trees problems, 0-1 knapsack problem, Traveling salesperson problem, Floyd Warshall algorithm.

**Branch and Bound:** Method, 0/1 knapsack and traveling salesperson problem

**UNIT - IV**

**String matching:** The naive String Matching algorithm, The Rabin-Karp Algorithm, String Matching with finite automata, The Knuth-Morris Pratt algorithm.

**Computational Complexity:** Basic Concepts, Polynomial vs Non-Polynomial Complexity, NP- hard & NP-complete classes. Approximation Algorithms

**Flow and Sorting Network:** Ford- Fulkerson method, Maximum bipartite matching, Sorting Networks, Comparison network, Zero- one principle, Bitonic sorting network, merging network

**Textbook(s):**

1. T. H. Cormen, C. E. Leiserson, R. L. Rivest, Clifford Stein, —Introduction to Algorithms], 3rd Ed., PHI, 2013.
2. Udit Aggarwal: Algorithm Design and Analysis, Dhanpat Rai and Co.
3. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, —Computer Algorithms/C++ —Second Edition, Universities Press.



<b>Compiler Design Lab</b>	<b>L</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>1</b>

<b>Discipline(s) / EAE / OAE</b>	<b>Semester</b>	<b>Group</b>	<b>Sub-group</b>	<b>Paper Code</b>
CSE/IT/CST/ITE	5	PC	PC	CIC-351

**Marking Scheme:**

1. Teachers Continuous Evaluation: 40 marks
2. Term end Theory Examinations: 60 marks

**Instructions:**

1. The course objectives and course outcomes are identical to that of (Compiler Design) as this is the practical component of the corresponding theory paper.
2. The practical list shall be notified by the teacher in the first week of the class commencement under intimation to the office of the Head of Department / Institution in which the paper is being offered from the list of practicals below. Atleast 10 experiments must be performed by the students, they may be asked to do more. Atleast 5 experiments must be from the given list.

1. Practice of LEX/YACC of compiler writing.
2. Write a program to check whether a string belong to the grammar or not.
3. Write a program to check whether a string include Keyword or not.
4. Write a program to remove left Recursion from a Grammar.
5. Write a program to perform Left Factoring on a Grammar.
6. Write a program to show all the operations of a stack.
7. Write a program to find out the leading of the non-terminals in a grammar.
8. Write a program to Implement Shift Reduce parsing for a String.
9. Write a program to find out the FIRST of the Non-terminals in a grammar.
10. Write a program to check whether a grammar is operator precedent.

<b>Operating Systems Lab</b>	<b>L</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>1</b>

<b>Discipline(s) / EAE / OAE</b>	<b>Semester</b>	<b>Group</b>	<b>Sub-group</b>	<b>Paper Code</b>
CSE/IT/CST/ITE	5	PC	PC	CIC-353

**Marking Scheme:**

1. Teachers Continuous Evaluation: 40 marks
2. Term end Theory Examinations: 60 marks

**Instructions:**

1. The course objectives and course outcomes are identical to that of (Operating Systems) as this is the practical component of the corresponding theory paper.
2. The practical list shall be notified by the teacher in the first week of the class commencement under intimation to the office of the Head of Department / Institution in which the paper is being offered from the list of practicals below. Atleast 10 experiments must be performed by the students, they may be asked to do more. Atleast 5 experiments must be from the given list.

1. Write a program to implement CPU scheduling for first come first serve.
2. Write a program to implement CPU scheduling for shortest job first.
3. Write a program to perform priority scheduling.
4. Write a program to implement CPU scheduling for Round Robin.
5. Write a program for page replacement policy using a) LRU b) FIFO c) Optimal.
6. Write a program to implement first fit, best fit and worst fit algorithm for memory management.
7. Write a program to implement reader/writer problem using semaphore.
8. Write a program to implement Producer-Consumer problem using semaphores.
9. Write a program to implement Banker's algorithm for deadlock avoidance.
10. Write C programs to Implement the various File Organization Techniques



<b>Computer Networks Lab</b>	<b>L</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>1</b>

<b>Discipline(s) / EAE / OAE</b>	<b>Semester</b>	<b>Group</b>	<b>Sub-group</b>	<b>Paper Code</b>
CSE/IT/CST/ITE	5	PC	PC	CIC-355
ICE	5	PC	PC	CIC-365

**Marking Scheme:**

1. Teachers Continuous Evaluation: 40 marks
2. Term end Theory Examinations: 60 marks

**Instructions:**

1. The course objectives and course outcomes are identical to that of (Computer Networks) as this is the practical component of the corresponding theory paper.
2. The practical list shall be notified by the teacher in the first week of the class commencement under intimation to the office of the Head of Department / Institution in which the paper is being offered from the list of practicals below. Atleast 10 experiments must be performed by the students, they may be asked to do more. Atleast 5 experiments must be from the given list.

1. Introduction to Networking Simulation Tools: Wireshark, Cisco Packet Tracer.
2. To understand the operation of TELNET by accessing the router in server room from a PC in IT office.
3. To implement an IP Addressing Scheme and Subnetting in small networks using Cisco Packet Tracer.
4. To implement the static routing using Cisco Packet Tracer.
5. To implement the DHCP onto the Network Topology using Cisco Packet Tracer.
6. To implement the DNS, Email Services in the Network using Cisco Packet Tracer.
7. To implement the Dynamic Routing Protocols: RIP, IGRP using Cisco Packet Tracer.
8. To construct multiple router networks and implement the EIGRP Protocol.
9. To implement the Network Address Resolution (NAT) using Cisco Packet Tracer.
10. Conducting a Network Capture and Monitoring with Wireshark Simulation Tool.

<b>Software Engineering Lab</b>	<b>L</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>1</b>

<b>Discipline(s) / EAE / OAE</b>	<b>Semester</b>	<b>Group</b>	<b>Sub-group</b>	<b>Paper Code</b>
CSE/IT/CST/ITE	5	PC	PC	CIC-357

**Marking Scheme:**

1. Teachers Continuous Evaluation: 40 marks
2. Term end Theory Examinations: 60 marks

**Instructions:**

1. The course objectives and course outcomes are identical to that of (Software Engineering) as this is the practical component of the corresponding theory paper.
2. The practical list shall be notified by the teacher in the first week of the class commencement under intimation to the office of the Head of Department / Institution in which the paper is being offered from the list of practicals below. Atleast 10 experiments must be performed by the students, they may be asked to do more. Atleast 5 experiments must be from the given list.

1. Write down the problem statement for a suggested system of relevance.
2. Do requirement analysis and develop Software Requirement Specification Sheet (SRS) for suggested system.
3. To perform the function oriented diagram: Data Flow Diagram (DFD) and Structured chart.
4. Draw the entity relationship diagram for the suggested system.
5. To perform the user's view analysis for the suggested system: Use case diagram.
6. To draw the structural view diagram for the system: Class diagram, object diagram.
7. To draw the behavioral view diagram: State-chart diagram, Activity diagram
8. To perform the behavioral view diagram for the suggested system: Sequence diagram, Collaboration diagram
9. To perform the implementation view diagram: Component diagram for the system.
10. To perform the environmental view diagram: Deployment diagram for the system.
11. To perform various testing using the testing tool unit testing, integration testing for a sample code of the suggested system.
12. Perform Estimation of effort using FP Estimation for chosen system.
13. To Prepare time line chart/Gantt Chart/PERT Chart for selected software project.

<b>Design and Analysis of Algorithm Lab</b>	<b>L</b>	<b>P</b>	<b>C</b>
		<b>2</b>	<b>1</b>

<b>Discipline(s) / EAE / OAE</b>	<b>Semester</b>	<b>Group</b>	<b>Sub-group</b>	<b>Paper Code</b>
CSE/IT/CST/ITE	5	PC	PC	CIC-359

**Marking Scheme:**

1. Teachers Continuous Evaluation: 40 marks
2. Term end Theory Examinations: 60 marks

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1. To implement following algorithm using array as a data structure and analyse its time complexity.
  - a) Merge sort
  - b) Quick sort
  - c) Bubble sort
  - d) Selection sort
  - e) Heap sort
2. To implement Linear search and Binary search and analyse its time complexity.
3. To implement Huffman Coding and analyse its time complexity.
4. To implement Minimum Spanning Tree and analyse its time complexity.
5. To implement Dijkstra's algorithm and analyse its time complexity.
6. To implement Bellman Ford algorithm and analyse its time complexity.
7. Implement N Queen's problem using Back Tracking.
8. To implement Matrix Multiplication and analyse its time complexity.
9. To implement Longest Common Subsequence problem and analyse its time complexity.
10. To implement naïve String Matching algorithm, Rabin Karp algorithm and Knuth Morris Pratt algorithm and analyse its time complexity.
11. To implement Sorting Network.