Theory of Computation

- Introduction to the Theory of Computation, Michael Sipser

	Introduction to the Theory of Computation
	Introduction
03	Automata, Computability, and Complexity – Topics 3
10	Mathematical Notions and Terminology – Topics 7
11	Definitions, Theorems, and Proofs – Topics 1
14	Types of Proof – Topics 3
15	Exercises, Problems and Solutions
	Part-01: Automata and Languages
	Regular Languages
20	Finite Automata – Topics 5
23	Nondeterminism – Topics 3
25	Regular Expressions – Topics 2
26	Non-regular Languages – Topics 1
27	Exercises, Problems and Solutions
	Contest-Free Language
32	Context-Free Grammars – Topics 5
35	Pushdown Automata – Topics 3
36	Non-Context-Free languages – Topics 1
40	Deterministic Context-Free Languages – Topics 4
41	Exercises, Problems and Solutions
	Part-02: Computability Theory
	The Church-Turing Thesis
43	Turing Machines – Topics 2
47	Variants of Turing Machines – Topics 4
49	The Definition of Algorithm – Topics 2
50	Exercises, Problems and Solutions
	Decidability
52	Decidable Languages – Topics 2
55	Un-decidability – Topics 3
56	Exercises, Problems and Solutions
	Reducibility
57	Un-decidable Problems from Language Theory – Topics 1
58	A Simple Un-decidable Problem
60	Mapping Reducibility – Topics 2
61	Exercises, Problems and Solutions
	Advanced Topics in Computability Theory
64	The Recursion Theorem – Topics 3
66	Decidability of Logical Theories – Topics 2
67	Turing Reducibility
70	A Definition of Information – Topics 3
71	Exercises, Problems and Solutions
	Part-03: Complexity Theory
	Time Complexity
74	Measuring Complexity – Topics 3
76	The Class P – Topics 2
78	The Class NP – Topics 2

Operation System

- Operating Systems: Internals and Design Principles, William Stallings

	Operating Systems: Internals and Design Principles
	Part-01: Background
	Computer System Overview
01	Basic Elements
02	Processor Registers
03	Instruction Execution
04	Interrupts
05	The Memory Hierarchy
06	Cache Memory
07	I/O Communication Techniques
08	Recommended Reading and Web Sites
09	Key Terms, Review Questions, and Problems
10	Appendix 1A: Performance Characteristics of Two-Level Memory
11	Appendix 1B: Procedure Control
	Operating System Overview
12	Operating System Objectives and Functions
13	The Evolution of Operating Systems
14	Major Achievements
15	Developments Leading to Modern Operating Systems
16	Microsoft Windows Overview
17	Traditional UNIX Systems
18	Modern UNIX Systems
19	Linux
20	Recommended Reading and Web Sites
21	Key Terms, Review Questions, and Problems
	Part-02: Processes
	Process Description and Control
22	What is a Process?
23	Process States
24	Process Description
25	Process Control
26	Execution of the Operating System
27	Security Issues
28	UNIX SVR 4 Process Management
29	Summary
	Recommended Reading
	Key Terms, Review Questions, and Problems
	Programming Project One Developing a Shell
	Threads, SMP, and Microkernels
30	Processes and Threads
31	Symmetric Multiprocessing (SMP)
32	Microkernels
33	Windows Vista Thread and SMP Management
34	Solaris Thread and SMP Management
35	Linux Process and Thread Management
36	Summary

Data Communications and Networking

- Data Communications and Networking, Behrouz A. Forouzan

	Data Communication and Networking
	Part-01: Overview
	Introduction
	Data Communications – Topics 3
	Networks – Topics 6
	The Internet – Topics 2
	Protocols and Standards – Topics 4
	Recommended Reading – Topics 3
	Key Terms
	Summary
	Practice Set – Topic 3
	Network Models
	Layered Tasks – Topics 2
	The OSI Model – Topics 3
	Layers in The OSI Model – Topics 8
	TCP/IP Protocol Suite – Topics 4
	Addressing – Topics 4
	Recommended Reading – Topics 3
	Key Terms
	Summary
	Practice Set – Topics 3
	Part-02: Physical Layer and Media
	Data and Signals
	Analog and Digital – Topics 3
	Periodic Analog Signals – Topics 6
	Digital Signals – Topics 4
	Transmission Impairment – Topics 3
	Data Rate Limits – Topics 3
	Performance – Topics 5
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Digital Transmission
	Digital-to-Digital Conversion – Topics 4
	Analog-to-Digital Conversion – Topics 2
	Transmission Models – Topics 2
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Analog Transmission
	Digital-to-Analog Conversion – Topics 4
	Analog-to-Analog Conversion – Topics 3
	Recommended Reading – Books
	Key Terms

	Summary
	Practice Set – Topics 2
	Bandwidth Utilization: Multiplexing and Spreading
	Multiplexing – Topics 4
	Spread Spectrum – Topics 2
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Transmission Media
	Guided Media – Topics 2
	Unguided Media: Wireless – Topics 3
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Switching
	Circuit-Switched Networks – Topics 4
	Datagram Networks – Topics 4
	Virtual-Circuit Networks – Topics 5
	Structure of a Switch – Topics 2
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Using Telephone and Cable Networks for Data Transmission
	Telephone Network – Topics 4
	Dialup Modems – Topics 1
	Digital Subscriber Line – Topics 6
	Cable TV Networks – Topics 2
	Cable TV For Data Transfer – Topics 4
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Part-03: Data Link Layer
	Error Detection and Correction
	Introduction – Topics 6
	Block Coding – Topics 4
	Linear Block Codes – Topics 2
	Cyclic Codes – Topics 6
	Recommended Reading – Books and RFCs
	Key Terms
	Summary
	Practice Set – Topics 2
	Data Link Control
	Framing – Topics 2
	Flow and Error Control – Topics 2
	Protocols
	Noiseless Channels – Topics 2
	Noisy Channels – Topics 4

	HDLC – Topics 3
	Point-to-Point Protocol – Topics 4
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Multiple Access
	Random-access Aloha – Topics 3
	Controlled Access – Topics 3
	Channelization – Topics 3
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Wired LANs: Ethernet
	IEEE Standards – Topics 2
	Standard Ethernet – Topics 2
	Changes in the Standard – Topics 3
	Fast Ethernet – Topics 2
	GIGABIT Ethernet – Topics 3
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Wireless LANs
	IEEE 802.11 – Topics 4
	Bluetooth – Topics 6
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Connecting LANs, Backbone Networks, and Virtual LANs
	Connecting Devices – Topics 8
	Backbone Networks – Topics 3
	Virtual LANs – Topics 5
	Recommended Reading – Books and Site
	Key Terms
	Summary
	Practice Set – Topics 2
	Wireless WANs: Cellular Telephone and Satellite Networks
	Cellular Telephony – Topics 7
	Satellite Networks – Topics 6
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Sonetisdh
	Architecture – Topics 3
	Sonet Layers – Topics 5
	Sonet Frames – Topics 4
	STS Multiplexing – Topics 3

	Sonet Networks – Topics 3
	Virtual Tributaries – Topics 1
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Virtual-Circuit Networks: Frame Relay and ATM
	Frame Relay – Topics 7
	ATM – Topics 6
	ATM LANs – Topics 4
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Part-04: Network Layer
	Netvl/ark Layer: Logical Addressing
	IPv4 Addresses – Topics 5
	IPv6 Addresses – Topics 2
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	Network Layer: Internet Protocol
	Internetworking – Topics 3
	IPv4 – Topics 4
	IPv6 – Topics 3
	Transition Form IPv4 to IPv6 – Topics 3
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	Network Layer: Address Mapping, Error Reporting, and Multicasting
	Address Mapping – Topics 2
	ICMP – Topics 5
	IGMP – Topics 6
	ICMPv6 – Topics 2
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	Network Layer: Delivery, Forwarding, and Routing
	Delivery – Topics 1
	Forwarding – Topics 3
	Unicast Routing Protocols – Topics 5
	Multicast Routing Protocols – Topics 4
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	Part-05: Transport Layer
	Process-fa-Process Delivery: UDp, TCp, and SeTP

	Process-to-Process Delivery – Topics 5
	User Datagram Protocol (UDP) – Topics 5
	TCP – Topics 7
	SCTP – Topics 7
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	Congestion Control and Quality of Service
	Data Traffic – Topics 2
	Congestion – Topics 1
	Congestion Control – Topics 2
	Two Examples – Topics 2
	Quality of service – Topics 2
	Techniques to Improve QoS – Topics 4
	Integrated Services – Topics 6
	Differentiated Services – Topics 1
	QoS In Switched Networks – Topics 2
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 2
	Part-06: Application Layer
	Domain Name System
	Name Space – Topics 2
	Domain Name Space – Topics 3
	Distribution of Name Space – Topics 4
	DNS in The Internet – Topics 3
	Resolution – Topics 6
	DNS Messages – Topics 1
	Types of Records – Topics 2
	Registrars
	Dynamic Domain Name System (DDNS)
	Encapsulation
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 2
	Remote Logging, Electronic Mail, and File Transfer
	Remote Logging – Topics 1
	Electronic Mail – Topics 5
	File Transfer – Topics 2
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	WWW and HTTP
	Architecture – Topics 4
	Web Documents – Topics 3
	HTTP – Topics 3
	Recommended Reading – Books, Sites, RFCs

	Key Terms
	Summary
	Practice Set – Topics 2
	Network Management: SNMP
	Network Management System – Topics 5
	Simple Network Management Protocol (SNMP) – Topics 9
	Recommended Reading – Books, Sites, RFCs
	Key Terms
	Summary
	Practice Set – Topics 3
	Multimedia
	Digitizing Audio and Video – Topics 2
	Audio and Video Compression – Topics 2
	Streaming Stored Audio / Video – Topics 4
	Streaming Live Audio / Video
	Real-Time Interactive Audio / Video – Topics 1
	RTP – Topics 2
	RTCP – Topics 6
	Voice Over IP – Topics 2
	Recommended Reading – Books, Sites
	Key Terms
	Summary
	Practice Set – Topics 3
	Part-07: Security
	Cryptography
	Introduction – Topics 2
	Symmetric-Key Cryptography – Topics 4
	Asymmetric-Key Cryptography – Topics 2
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 3
	Network Security
	Security Services – Topics 5
	Message Confidentiality – Topics 2
	Message Integrity – Topics 6
	Message Authentication – Topics 1
	Digital Signature – Topics 5
	Entity Authentication – Topics 2
	Key Management – Topics 2
	Recommended Reading – Books
	Key Terms
	Summary
	Practice Set – Topics 3
	Security in the Internet: IPSec, SSUFLS, PNP, VPN, and Firewalls
	IPSecurity (IPSec) – Topics 5
	SSLffLs – Topics 5
	PGP – Topics 6
	Firewalls – Topics 2
	Recommended Reading – Books
	Key Terms

Distributed System

- Designing Distributed Systems: Patterns and Paradigms for Scalable, Reliable Services, Brendan Burns

	Designing Distributed Systems: Patterns and Paradigms for Scalable, Reliable Services
	Introduction
	A Brief History of Systems Development
	A Brief History of Patterns in Software Development – Topics 3
	The Value of Patterns, Practices, and Components – Topics 3
	Summary
	Part-01: Single-Node Patterns
	Motivations and Summary
	The Sidecar Pattern
	An Example Sidecar: Adding HTTPS to a Legacy Services
	Dynamic Configuration with Sidecars
	Modular Application Containers – Topics 1
	Building a Simple PaaS with Sidecars
	Designing Sidecars for Modularity and Reusability – Topics 3
	Summary
	Ambassadors
	Using an Ambassador to Shard a Service – Topics 1
	Using an Ambassador for Service Brokering
	Using an Ambassador to Do Experimentation or Request Splitting – Topics 1
	Adapters
	Monitoring – Topics 1
	Logging – Topics 1
	Adding a Health Monitor – Topics 1
	Part-02: Serving Patterns
	Introduction to Micro-services
	Replicated Load-Balanced Services
	Stateless Services – Topics 2
	Session Tracked Services
	Application-Layer Replicated Services
	Introducing a Caching Layer – Topics 2
	Expanding the Caching Layer – Topics 3
	Summary
	Sharded Services
	Sharded Caching – Topics 4
	An Examination of Sharding Functions – Topics 3
	Sharded, Replicated Serving
	Hot Sharding Systems
	Scatter/Gather
	Scatter/Gather with Root Distribution – Topics 1
	Scatter/Gather with Leaf Sharding – Topics 2
	Scaling Sctter/Gather for Reliability and Scale
	Functions and Event-Driven Processing
	Determining When FaaS Makes Sense – Topics 5
	Patterns for FaaS – Topics 6
	Ownership Election
	Determining If Your Even Need Master Election

	The Basics of Master Election – Topics 5
	Handling Concurrent Data Manipulation
	Part-03: Batch Computational Patterns
	Work Queue Systems
	A Generic Work Queue System – Topics 3
	Hands On: Implementing a Video Thumbnail
	Dynamic Scaling of the Workers
	The Multi-Worker Pattern
	Event-Driven Batch Processing
	Patterns of Event-Driven Processing – Topics 5
	Hands On: Building an Event-Driven Flow for New User Sign-Up
	Publisher/Subscriber Infrastructure
	Hands On: Deploying Kafka
	Coordinated Batch Processing
	Join (or Barrier Synchronization)
	Reduce – Topics 3
	Hands On: An Image Tagging and Processing Pipeline
	Conclusion: A New Beginning?

Parallel Computing

- Algorithms and Parallel Computing, Fayez Gebali

	Algorithms and Parallel Computing
	Introduction
	Introduction
	Toward Automating Parallel Programming
	Algorithms
	Parallel Computing Design Considerations
	Parallel Algorithms and Parallel Architectures
	Relating Parallel Algorithm and Parallel Architecture
	Implementation of Algorithms: A Two-Sided Problem
	Measuring Benefits of Parallel Computing
	Amdahl's Law for Multiprocessor Systems
	Gustafson-Barsis's Law
	Applications of Parallel Computing
	Enhancing Uniprocessor Performance
	Introduction
	Increasing Processor Clock Frequency
	Parallelizing ALU Structure
	Using Memory Hierarchy
	Pipelining
	Very Long Instruction Word (VLIW) Processor
	Instruction-Level Parallelism (ILP) and Superscalar Processors
	Multithreaded Processor
	Parallel Computers
	Introduction
	Parallel Computing
	Shared-Memory Multi-processors (Uniform Memory Access [UMA])
	Distributed-Memory Multiprocessor (Non-uniform Memory Access [NUMA])
	SIMD Processor
	Systolic Processor
	Cluster Computing
	Grid (Cloud) Computing
	Multicore Systems
	SM
	Communication Between Parallel Processors
	Summary of Parallel Architectures
	Shared-Memory Multiprocessors
	Introduction
	Cache Coherence and Memory Consistency
	Synchronization and Mutual Exclusion
	Interconnection Networks
	Introduction
	Classification of Interconnection Networks by Logical Topologies
	Interconnection network Switch Architecture
	Concurrency Platforms
	Introduction
	Concurrency Platforms

	Cilk++
	OpenMP
	Compute Unified Device Architecture (CUDA)
	Ad Hoc Techniques for Parallel Algorithms
	Introduction
	Defining Algorithm Variables
	Independent Loop Scheduling
	Dependent Loops
	Loop Spreading for Simple Dependent Loops
	Loop Unrolling Problem Partitioning
	Divide-and-Conquer (Recursive Partitioning) Strategies
	Pipelining
	Non-serial-Parallel Algorithms
	Introduction
	Comparing DAG and DCG Algorithms
	Parallelizing NSPA Algorithms Represented by a DAG
	Formal Technique for Analyzing NSPAs
	Detecting Cycles in the Algorithm
	Extracting Serial and Parallel Algorithm Performance Parameters
	Useful Theorems
	Performance of Serial and Parallel Algorithms on Parallel Computers
	z-Transform Analysis
	Introduction
	Definition of z-Transform
	The 1-D FIR Digital Filter Algorithm
	Software and Hardware Implementations of the z-Transform
	Design 1: Using Horner's Rule for Broadcast Input and Pipelined Output
	Design 2: Pipelined Input and Broadcast Output
	Design 3: Pipelined Input and Output
	Dependence Graph Analysis
	Introduction
	The 1-D FIR Digital Filter Algorithm
	The Dependence Graph of an Algorithm
	Deriving the Dependence Graph for an Algorithm
	The Scheduling Function for the 1-D FIR Filter
	Node Projection Operation
	Nonlinear Projection Operation
	Software and Hardware Implementations of the DAG Technique
	Computational Geometry Analysis
	Introduction
	Matrix Multiplication Algorithm
	The 3-D Dependence Graph and Computation Domain D
	The Facets and Vertices of D
	The Dependence Matrices of the Algorithm Variables
	Null-space of Dependence Matrix: The Broadcast Subdomain B
	Design Space Exploration: Choice of Broadcasting Versus Pipelining Variable s
	Data Scheduling
	Projection Operation Using the Linear Projection operator
	Effect of Projection Operation on Data
	The Resulting Multithreaded/Multiprocessor Architecture
	Summary of Work Done in this Chapter

	Case Study: One-Dimensional IIR Digital Filters
	Introduction
	The 1-D IIR Digital Filter Algorithm
	The IIR Filter Dependence Graph
	z-Domain Analysis of 1-D IIR Digital Filter Algorithm
	Case Study: Two and Three Dimensional Digital Filters
	Introduction
	Line and Frame Wraparound Problems
	2-D Recursive Filters
	3-D Digital Filters
	Case Study: Multi-rate Decimators and Interpolators
	Introduction
	Decimator Structures
	Decimator Dependence Graph
	Decimator Scheduling
	Decimator DAG for s1 = [1 0]
	Decimator DAG for s2 = [1 -1]
	Decimator DAG for s3 = [1 1]
	Poly-phase Decimator Implementations
	Interpolator Structures
	Interpolator Dependence Graph
	Interpolator Scheduling
	Interpolator DAG for s1 = [1 0]
	Interpolator DAG for s2 = [1 -1]
	Interpolator DAG for s3 = [1 1]
	Poly-phase Interpolator Implementations
	Case Study: Pattern Matching
	Introduction
	Expressing the Algorithm as a Regular Iterative Algorithm (RIA)
	Obtaining the Algorithm Dependence Graph
	Data Scheduling
	DAG Node Projection
	DESIGN 1: Design Space Exploration When s = [1 1]
	DESIGN 2: Design Space Exploration When s = [1 -1]
	DESIGN 3: Design Space Exploration When s = [1 0]
	Case Study: Motion Estimation for Video Compression
	Introduction
	FBMAs
	Data Buffering Requirements
	Formulation of the FBMA
	Hierarchical Formulation of Motion Estimation
	Hardware Design of the Hierarchy Blocks
	Case Study: Multiplication Over GF(2m)
	Introduction
	The Multiplication Algorithm in GF(2m)
	Expressing Field Multiplication as an RIA
	Field Multiplication Dependence Graph
	Data Scheduling
	DAG Node Projection
	Design 1: Using d1 = [1 0]
	Design 2: Using d2 = [1 1]

	Design 3: Using d3 = [1 -1]
	Applications of Finite Field Multipliers
	Case Study: Polynomial Division Over GF(2)
	Introduction
	The Polynomial Division Algorithm
	The LFSR Dependence Graph
	Data Scheduling
	DAG Node Projection
	Design 1: Design Space Exploration When s1 = [1 -1]
	Design 2: Design Space Exploration When s2 = [1 0]
	Design 3: Design Space Exploration When s3 = [1 –o.5]
	Comparing the Three Designs
	The Fast Fourier Transform
	Introduction
	Decimation-in-Time FFT
	Pipeline Radix-2 Decimation-in-Time FFT Processor
	Decimation-in-Frequency FFT
	Pipeline Radix-2 Decimation-in-Frequency FFT Processor
	Solving Systems of Linear Equations
	Introduction
	Special Matrix Structures
	Forward Substitution (direct Technique)
	Back Substitution
	Matrix Triangularization Algorithm
	Successive Over Relaxation (SOR) (Iterative Technique)
	Problems
	Solving Partial Differential Equations Using Finite Difference Method
	Introduction
	FDM for 1-D Systems

Discrete Mathematics

- Mathematical Structure for Computer Science: A Modern Approach to Discrete Mathematics, Judith L. Gersting

	Mathematical Structure for Computer Science: A Modern Approach to Discrete Mathematics
	Formal Logic
	Statements, Symbolic Representation, and Tautologies – Topics 4 and Exercises
	Propositional Logic – Topics 4 and Exercises
	Quantifiers, predicates, and Validity – Topics 3 and Exercises
	Predicate Logic – Topics 8 and Exercises
	Logic Programming – Topics 4 and Exercises
	Proof of Correctness – Topics 3 and Exercises
	Review on the Computer
	Proofs, Recursion, and Analysis of Algorithms
	Proof Techniques – Topics 8 and Exercises
	Induction – Topics 3 and Exercises
	More on Proof of Correctness – Topics 2 and Exercises
	Recursive Definitions – Topics 4 and Exercises
	Recurrence Relations – Topics 5 and Exercises
	Analysis of Algorithms – Topics 3 and Exercises
	Sets, Combinatory, Probability and Number Theory
	Sets – Topics 7 and Exercises
	Counting – Topics 4 and Exercises
	Principle of Inclusion and Exclusion; Pigeonhole Principle – Topics 2 and Exercises
	Permutations and Combinations – Topics 4 and Exercises
	Probability – Topics 5 and Exercises
	Binomial Theorem – Topics 3 and Exercises
	Number Theory – Topics 3 and Exercises
	Review on the Computer
	Relations, Functions, and Matrices
	Relations – Topics 5 and Exercises
	Topological Sorting – Exercises
	Relations and Databases – Topics 5 and Exercises
	Functions – Topics 12 and Exercises
	The Mighty Mod Function – Topics 8 and Exercises
	Matrices – Topics 3 and Exercises
	Review on the Computer
	Graphs and Trees
	Graphs and Their Representations – Topics 8 and Exercises
	Trees and Their Representations – Topics 5 and Exercises
	Decision Trees – Topics 4 and Exercises
	Huffman Codes – Topics 4 and Exercises
	Review on the Computer
	Graph Algorithms
	Directed Graphs and Binary Relations; Warshall's Algorithm – Topics 3 and Exercises
	Euler Path and Hamiltonian Circuit – Topics 2 and Exercises
	Shortest Path and Minimal Spanning Tree – Topics 2 and Exercises
	Traversal Algorithms – Topics 4 and Exercises
	Articulation Points and Computer Networks – Topics 3 and Exercises
	Review on the Computer

Schedule of Practice

	System and Communication		
01			
	Total Lab Topics		
02			
03			
04			
	Total Theoretical Topics		
05			
06			
	Total Elective Topics		
	4 Months: (4 Weeks x 4 = 16 Weeks x 15 Hours) = 240 Hours **Per Day : (1000 Topics / 240 = 5 Topics x 3 Hours) = 15 Topics**		

Practice Hours Per Week	
Theory	5 Days x 3 Hours (Evening) = 15 Hours
Lab Practice	5 Days x 3 Hours (Morning) = 15 Hours
Total Lesson Hours	5 Days x 6 Hours (Full Day) = 30 Hours
Review and Test	1 Days x 6 Hours (Full Day) = 06 Hours
Industrial Project	1 Days x 6 Hours (Full Day) = 06 Hours
Total Review Hours	2 Days x 6 Hours (Full Day) = 12 Hours
Week Hours	**7 Days x 6 Hours (Full Day) = 42 Hours**

Resources:-

1. Listed Books
2. GPT: Concept and Questions
3. YouTube: Professional and Industrial Practice Example
4. Websites: Additional Resources
5. Certification: MIT, Harvard, Oxford, Microsoft, Google, OpenAI, IBM, Etc

Practice Recommendation:-

- Clear Each Concept Step by Step
- Apply to Get Output
- Manipulate
- Then Summarize the Lesson
- Make the Connected and Related List of Summarized Concept

Review Recommendation:-

- Make Quiz, Interview Question (Google, Microsoft), Competitive Questions Using GPT
- Make Projects using GPT and Community According to Market and Client Needs