STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA

TEACHING AND EVALUATION SCHEME FOR 3rd Semester Computer Science & Engg. (w.e.f. 2019-20)

Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	End Sem Exams	Exams (Hours)	Total
		Theory							
	Th.1	Computer System Architecture	04		-	20	80	03	100
	Th.2	Data Structure	04		-	20	80	03	100
	Th.3	Digital Electronics	04		-	20	80	03	100
	Th.4	Object Oriented Methodology	04		-	20	80	03	100
	Th.5	Environmental studies	04		-	20	80	03	100
		Total	20			100	400	-	500
		Practical							
	Pr.1	Data Structure Lab using C	-	-	04	25	50		75
	Pr.2	Digital Electronics Lab	-	-	04	25	50		75
	Pr.3	Object Oriented Programming using JAVA	-	-	04	25	25		50
	Pr.4	Office Automation Lab	-	-	04	25	25		50
		Student Centered Activities(SCA)	-	-	03	-	-		
		Total	-	-	*19*	*100*	*150*	-	*250*
		Grand Total	**20**	**-**	**19**	**200**	**550**	**-**	**750**

Abbreviations: L-Lecturer, T-Tutorial, P-Practical. Each class is of minimum 55 minutes duration

Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%

SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAM etc., Seminar and SCA shall be conducted in a section.

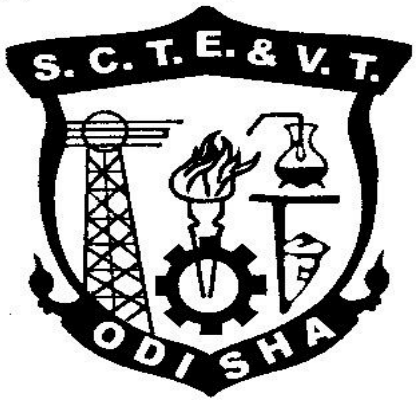
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester

CURRICULLUM OF 3RD SEMESTER

For

DIPLOMA IN COMPUTER SCIENCE & ENGINEERING

(Effective FROM 2019-20 Sessions)



STATE COUNCIL FOR TECHNICAL EDUCATION & VOCATIONAL TRAINING, ODISHA, BHUBANESWAR

Th-1 COMPUTER SYSTEM ARCHITECTURE

Common to (CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	BASIC STRUCTURE OF COMPUTER HARDWARE	06
2	INSTRUCTIONS & INSTRUCTION SEQUENCING	07
3	PROCESSOR SYSTEM	10
4	MEMORY SYSTEM	10
5	INPUT – OUTPUT SYSTEM	10
6	I/O INTERFACE & BUS ARCHITECTURE	10
7	PARALLEL PROCESSING	07
9	**TOTAL**	**60**

B. RATIONAL: Now a days the usage of computer has become very essential in various areas like education, entertainment, business, sports etc. This subject will expose the learner to have an idea about the architecture of different components of a computer system and their operation procedure. Further the learner will have idea how the different components integrate to execute a task to get the result. It also gives an idea how to improve the processing capability.

C. OBJECTIVE: After completion of this course the student will be able to**:**

- Understand the basic structure of a computer with instructions.
- Learn about machine instructions and program execution.
- Learn about the internal functional units of a processor and how they are interconnected.
- Understand how I/O transfer is performed.
- Learn about basic memory circuit, organization and secondary storage.
- Understand concept of parallel processing.

D. COURSE CONTENTS:

1. Basic structure of computer hardware

1.1Basic Structure of computer hardware
1.2Functional Units
1.3Computer components
1.4 Performance measures
1.5 Memory addressing & Operations

2. Instructions & instruction Sequencing

2.1 Fundamentals to instructions
2.2 Operands
2.3 Op Codes
2.4 Instruction formats
2.5 Addressing Modes

3. Processor System

3.1 Register Files
3.2 Complete instruction execution
- Fetch

- Decode
- Execution

3.3 Hardware control
3.4 Micro program control

4. Memory System

4.1Memory characteristics
4.2 Memory hierarchy
4.3 RAM and ROM organization
4.4 Interleaved Memory
4.5 Cache memory
4.6 Virtual memory

5. Input – Output System

5.1 Input - Output Interface
5.2 Modes of Data transfer
5.3 Programmed I/O Transfer
5.4 Interrupt driven I/O
5.5 DMA
5.6 I/O Processor

6. I/O Interface & Bus architecture

6.1 Bus and System Bus
6.2 Types of System Bus

- Data
- Address
- Control

7.1 Bus
6.3 Bus Structure
6.4 Basic Parameters of Bus design
6.5 SCSI
6.6 USB

7. Parallel Processing

7.1 Parallel Processing
7.2 Linear Pipeline
7.3 Multiprocessor
7.4 Flynn's Classification

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Book Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the Publisher
1	Moris Mano	Computer System Architecture	PHI
2	Er. Rajeev Chopra	Computer Architecture and Organisation	S.Chand
3	Parthasarthy, Senthil Kumar	Fundamentals of Computer Architecture	TMH

Th-2 DATA STRUCTURE

Common to (CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTRODUCTION	04
2	STRING PROCESSING	03
3	ARRAYS	07
4	STACKS & QUEUES	08
5	LINKED LIST	08
6	TREE	08
7	GRAPHS	06
8	SORTING SEARCHING & MERGING	08
9	FILE ORGANIZATION	08
	TOTAL	**60**

B. RATIONAL: The study of **Data structure** is an essential part of computer science. Data structure is a logical & mathematical model of storing & organizing data in a particular way in a computer. In system programming application programming the methods & techniques of data structures are widely used. The study of data structure helps the students in developing logic & structured programs.

C.OBJECTIVE: After completion of this **course** the student will be able to**:**

- Understand the concepts of linear data structures, their operations and applications
- Understand the operation in abstract data type like Stack and Queue.
- Understand the concept of pointers and their operations in linked list.
- Know the concepts of non-linear data structures, their operations and applications in tree and graph.
- Understand the various sorting and searching techniques.
- Understand file storage and access techniques.

D. DETAIL CONTENT:

1.0 INTRODUCTION:

1.1 Explain Data, Information, data types

1.2 Define data structure & Explain different operations

1.3 Explain Abstract data types

1.4 Discuss Algorithm & its complexity

1.5 Explain Time, space tradeoff

2.0 STRING PROCESSING

2.1 Explain Basic Terminology, Storing Strings

2.2 State Character Data Type,

2.3 Discuss String Operations

3.0 ARRAYS

3.1 Give Introduction about array,

3.2 Discuss Linear arrays, representation of linear array In memory

3.3 Explain traversing linear arrays, inserting & deleting elements

3.4 Discuss multidimensional arrays, representation of two dimensional arrays in memory (row major order & column major order), and pointers

3.5 Explain sparse matrices.

4.0 STACKS & QUEUES

4.1 Give fundamental idea about Stacks and queues

4.2 Explain array representation of Stack

4.3 Explain arithmetic expression ,polish notation & Conversion

4.4 Discuss application of stack, recursion

4.5 Discuss queues, circular queue, priority queues.

5.0 LINKED LIST

5.1 Give Introduction about linked list

5.2 Explain representation of linked list in memory

5.3 Discuss traversing a linked list, searching,

5.4 Discuss garbage collection.

5.5 Explain Insertion into a linked list, Deletion from a linked list, header linked list

6.0 TREE

6.1 Explain Basic terminology of Tree

6.2 Discuss Binary tree, its representation and traversal, binary search tree, searching,

6.3 Explain insertion & deletion in a binary search trees

7.0 GRAPHS

7.1 Explain graph terminology & its representation,

7.2 Explain Adjacency Matrix, Path Matrix

8.0 SORTING SEARCHING & MERGING

8.1 Discuss Algorithms for Bubble sort, Quick sort,

8.2 Merging

8.3 Linear searching, Binary searching.

9.0 FILE ORGANIZATION

9.1 Discuss Different types of files organization and their access method,

9.2 Introduction to Hashing, Hash function, collision resolution, open addressing.

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Book Recommended:-

Sl No.	Name of Authors	Title of Book	Name of Publisher:
1	S. Lipschutz	Data Structure	Schaum Series
2	A.N.Kamthane	Introduction to Data Structure in C	Pearson Education
3	Reema Thereja	Data Structure using C	Oxford University Press

Th.3 - DIGITAL ELECTRONICS

(Common to ETC, AE&I, CSE, IT, EIC, Mechatronics)

Theory	: 4 Periods per week	I.A.	: 20 Marks
Total Periods	: 60 Periods	Term End Exam	: 80 Marks
Examination	: 3 Hours	TOTAL MARKS	: 100 Marks

Chapter wise Distribution of periods with Total periods

Sl. No.	Topics	Periods
1.	Basics of Digital Electronics	12
2.	Combinational logic circuits	12
3.	Sequential logic circuits	12
4.	Registers, Memories & PLD	08
5.	A/D and D/A Converters	07
6.	Logic Families	09
	TOTAL	60

Rationale:

Today term digital has become a part of our everyday life. The tremendous power and usefulness of digital electronics can be seen from the wide variety of industrial and consumer products, such as automated industrial machinery, computers, microprocessors, pocket calculators, digital watches, microcontrollers, Digital life support machines, real time systems and clocks, TV games, etc. which are based on the principles of digital electronics. The areas of applications of digital electronics have been increasing every day. In fact, digital systems have invaded all walks of life. This subject will very much helpful for student to understand clearly about the developmental concept of digital devices

Objective:

After completion of this course the student will be able to:

1. Explain Binary, Octal, Hexadecimal number systems and compare with decimal system.
2. Perform binary addition, subtraction, Multiplication and Division.
3. Write 1's complement and 2's complement numbers for a given binary number & Perform subtraction
4. Compare weighted and Un-weighted codes and its applications
5. State Boolean expressions for the given statement of the problem
6. State De-Morgan's theorems &Apply De Morgan's theorems and other postulates to simple Boolean expressions.
7. Use Karnaugh Map to simplify Boolean Expression (upto3 variables only).
8. Implement of Logic Gates, i.e. AND, OR, NOT operators with truth table.
9. Working of combinational logic circuits, function of the Half-adder, full-adder.
10. Explain 2'scomplimentparalleladder/subtractor circuit.
11. Working of Serial & parallel adder with block diagram/circuit diagram
12. Explain the Operation of 4x1 Multiplexer & 1x4 De-Multiplexer, Decoders, Encoder, comparator.
13. Understanding the working of Sequential Logic circuits
14. Construct SR, JK, D, T, Master Slave Flip Flop.
15. Counters and different types and operations
16. Explain the working of Registers and memories & PLD

17. Explain various types of memories, Differentiate between ROM and RAM
18. Working of A/D and D/A converters & Necessity of A/D and D/A converters.
19. Explain Various logic families and Characteristics of Digital ICs

Detailed Contents:

Unit-1: Basics of Digital Electronics

1.1 Number System-Binary, Octal, Decimal, Hexadecimal - Conversion from one system to another number system.

1.2 Arithmetic Operation-Addition, Subtraction, Multiplication, Division, 1's & 2's complement of Binary numbers& Subtraction using complements method

1.3 Digital Code & its application & distinguish between weighted & non-weight Code, Binary codes, excess-3 and Gray codes.

1.4 Logic gates: AND,OR,NOT,NAND,NOR, Exclusive-OR, Exclusive-NOR--Symbol, Function, expression, truth table & timing diagram

1.5 Universal Gates& its Realisation

1.6 Boolean algebra, Boolean expressions, Demorgan's Theorems.

1.7 Represent Logic Expression: SOP & POS forms

1.8 Karnaugh map (3 & 4 Variables)&Minimization of logical expressions ,don't care conditions

Unit-2: Combinational Logic Circuits

2.1 Half adder, Full adder, Half Subtractor, Full Subtractor, Serial and Parallel Binary 4 bit adder.

2.2 Multiplexer (4:1), De- multiplexer (1:4), Decoder, Encoder, Digital comparator (3 Bit)

2.3 Seven segment Decoder

(Definition, relevance, gate level of circuit Logic circuit, truth table, Applications of above)

Unit-3: Sequential logic Circuits

3.1 Principle of flip-flops operation, its Types,
3.2 SR Flip Flop using NAND,NOR Latch (un clocked)
3.3 Clocked SR,D,JK,T,JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications
3.4 Concept of Racing and how it can be avoided.

Unit-4: Registers, Memories & PLD

4.1 Shift Registers-Serial in Serial -out, Serial- in Parallel-out, Parallel in serial out and Parallel in parallel out
4.2 Universal shift registers-Applications.
4.3 Types of Counter & applications
4.4 Binary counter, Asynchronous ripple counter (UP & DOWN), Decade counter. Synchronous counter, Ring Counter.
4.5 Concept of memories-RAM, ROM, static RAM, dynamic RAM,PS RAM
4.6 Basic concept of PLD & applications

Unit-5: A/D and D/A Converters

5.1 Necessity of A/D and D/A converters.
5.2 D/A conversion using weighted resistors methods.
5.3 D/A conversion using R-2R ladder (Weighted resistors) network.
5.4 A/D conversion using counter method.
5.5 A/D conversion using Successive approximate method

Unit-6: LOGIC FAMILIES

6.1 Various logic families &categories according to the IC fabrication process
6.2 Characteristics of Digital ICs- Propagation Delay, fan-out, fan-in, Power Dissipation ,Noise Margin ,Power Supply requirement &Speed with Reference to logic families.
6.3 Features, circuit operation &various applications of TTL(NAND), CMOS (NAND & NOR)

Coverage of Syllabus upto Internal Exams (I.A.)

Chapter 1,2,3

Books Recommended

Sl No.	Name of Authors	Title of Book	Name of Publisher:
1	RP JAIN	Modern Digital Electronics	TMH
2	Ananda Kumar	Fundamental of Digital Electronics	PHI Publication
3	P.RAJA	Digital Electronics	SCITECH Publication
4	S.Salivahanan ,S.Arivazhagan	Digital Circuits Design	VIKAS Pub House
5	M. Morris Mano	Digital Logic and Computer Design	MGH
6	Dr. R. S. Sedha	Digital Electronics	S. chand

Th-4 OBJECT ORIENTED METHODOLOGY

Common to (CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	PRINCIPLES OF OBJECT ORIENTED PROGRAMMING	05
2	INTRODUCTION TO JAVA	10
3	OBJECTS AND CLASSES	08
4	USING JAVA OBJECTS	06
5	INHERITANCE	08
6	POLYMORPHISM	08
7	JAVA FILES AND I/O	06
8	PACKAGES: PUTTING CLASSES TOGETHER	05
9	EXCEPTION HANDLING	04
	TOTAL	**60**

RATIONALE: **Object-oriented programming** is an approach to handle the increasing complexities of the programs, program organization and development by incorporating the structured programming features with several new concepts. It helps to formulate the problems in a better way giving high reliability, adaptability and extensibility to the applications. Java is a simple, reliable, portable and powerful object-oriented programming language, which enables a programmer to write programs to produce the solution to live problems. By undergoing this course, the students will be able to understand the principles of object oriented programming, with programs in Java and use them to make implemented.

OBJECTIVE: After completion of this **course** the student will be able to**:**

- Understand the concepts of OOPs, their advantages and applications
- Comprehend the features of Java
- Know to create classes, objects, methods
- Know the concepts and advantages of overloading methods and type conversions
- Appreciate the concepts of inheritance and the various types of inheritance.
- Understand the use of Interfaces and system packages
- Use the various operations of files to perform file operations
- Understand the concept of managing errors and exceptions

1 **OBJECT ORIENTED PROGRAMMING (OOPS) CONCEPTS** 05

1.1 Programming Languages
1.2 Object Oriented Programming
1.3 OOPS concepts and terminology
1.4 Benefit of OOPS
1.5 Application of OOPS

2 **INTRODUCTION TO JAVA** 10

2.1 What is Java ?
2.2 Execution Model of Java

2.3 The Java Virtual Machine
2.4 A First Java Program
2.5 Variables and Data types
2.6 Primitive Datatypes & Declarations
2.7 Numeric and Character Literals
2.8 String Literals
2.9 Arrays, Non-Primitive Datatypes
2.10 Casting and Type Casting
2.11 Widening and Narrowing Conversions
2.12 Operators and Expressions
2.13 Control Flow Statements

3 **OBJECTS AND CLASSES** 08

3.1 Concept and Syntax of class
3.2 Defining a Class
3.3 Concept and Syntax of Methods
3.4 Defining Methods
3.5 Creating an Object
3.6 Accessing Class Members
3.7 Instance Data and Class Data
3.8 Constructors
3.9 Access specifiers
3.10 Access Modifiers
3.11 Access Control

4 **USING JAVA OBJECTS** 06

4.1 String Builder and String Buffer
4.2 Methods and Messages
4.3 Parameter Passing
4.4 Comparing and Identifying Objects

5 **INHERITANCE** 08

5.1 Inheritance in Java
5.2 Use of Inheritance
5.3 Types of Inheritance
5.4 Single Inheritance
5.5 Multi-level Inheritance
5.6 Hierarchical Inheritance
5.7 Hybrid Inheritance

6 **POLYMORPHISM** 08

6.1 Types of Polymorphism
6.2 Method Overloading
6.3 Run time Polymorphism
6.4 Method Overriding

7 **PACKAGES: PUTTING CLASSES TOGETHER** 06

7.1 Introduction
7.2 Java API Packages
7.3 Using System Packages
7.4 Naming Convention
7.5 Creating Packages
7.6 Accessing a Package
7.7 Using a Package
7.8 Adding a Class to Package
7.9 Hiding Classes

7.10 Static Import

8 **JAVA FILES AND I/O** 05

8.1 What is a stream ?
8.2 Reading and writing to files(only txt files
8.3 Input and Output Stream
8.4 Manipulating Input data
8.5 Opening and Closing Streams
8.6 Predefined streams
8.7 File handling Classes and Methods

9 **EXCEPTION HANDLING** 06

9.1 Exceptions Overview
9.2 Exception Keywords
9.3 Catching Exceptions
9.4 Using Finally Statement
9.5 Exception Methods
9.6 Declaring Exceptions
9.7 Defining and throwing exceptions
9.8 Errors and Runtime Exceptions

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of Publisher:
01	E. Balagurusami	Programming With Java A Primer	The McGraw-Hill Companies
02	Patric Naughton Herbert Schildt	Java™ 2: The Complete Reference	Tata McGraw-Hill Publishing Company Limited
03	Rashmi Kanta Das	Core Java For Beginners	Vikas Publishing
04	Herbert Schildt	Java: A Beginner's Guide	McGraw-Hill Education
05	Cay S. Horstmann	Core Java Volume I - Fundamentals	Prentice Hall

Th5. ENVIRONMENTAL STUDIES

(Common to all Branches)

Name of the Course: Diploma in Electrical Engineering			
Course code:		Semester	3rd
Total Period:	60	Examination :	3 hrs
Theory periods:	4P / week	Internal Assessment:	20
Maximum marks:	100	End Semester Examination ::	80

A. RATIONALE:

Due to various aspects of human developments including the demand of different kinds of technological innovations, most people have been forgetting that, the Environment in which they are living is to be maintained under various living standards for the preservation of better health. The degradation of environment due to industrial growth is very much alarming due to environmental pollution beyond permissible limits in respect of air, water industrial waste, noise etc. Therefore, the subject of Environmental Studies to be learnt by every student in order to take care of the environmental aspect in each and every activity in the best possible manner.

B. OBJECTIVE:

After completion of study of environmental studies, the student will be able to:

1. Gather adequate knowledge of different pollutants, their sources and shall be aware of solid waste management systems and hazardous waste and their effects.
2. Develop awareness towards preservation of environment.

C. Topic wise distribution of periods:

Sl. No.	Topics	Period
1	The Multidisciplinary nature of environmental studies	04
2	Natural Resources	10
3	Systems	08
4	Biodiversity and it's Conservation	08
5	Environmental Pollution	12
6	Social issues and the Environment	10
7	Human population and the environment	08
	Total:	**60**

D. COURSE CONTENTS

1. The Multidisciplinary nature of environmental studies:

1.1 Definition, scope and importance.

1.2 Need for public awareness.

2. Natural Resources:

Renewable and non-renewable resources:

a) Natural resources and associated problems.
   2.1.1. Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction mining, dams and their effects on forests and tribal people.
   2.1.2. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
   2.1.3. Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.
   2.1.4. Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, .
   2.1.5. Energy Resources: Growing energy need, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
   2.1.6. Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification.
b) Role of individual in conservation of natural resources.
c) Equitable use of resources for sustainable life styles.

3. **Systems:**

3.1. Concept of an eco-system.
3.2. Structure and function of an eco-system.
3.3. Producers, consumers, decomposers.
3.4. Energy flow in the eco systems.
3.5. Ecological succession.
3.6. Food chains, food webs and ecological pyramids.
3.7. Introduction, types, characteristic features, structure and function of the following eco system:
3.8. Forest ecosystem:
3.9. Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries).

4. **Biodiversity and it's Conservation:**

4.1. Introduction-Definition: genetics, species and ecosystem diversity.
4.2. Biogeographically classification of India.
4.3. Value of biodiversity: consumptive use, productive use, social ethical, aesthetic and optin values.
4.4. Biodiversity at global, national and local level.
4.5. Threats to biodiversity:Habitats loss, poaching of wild life, man wildlife conflicts.

5. **Environmental Pollution:**

5.1. Definition Causes, effects and control measures of:

a) Air pollution.
b) Water pollution.
c) Soil pollution
d) Marine pollution
e) Noise pollution.
f) Thermal pollution
g) Nuclear hazards.

5.2. Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
5.3. Role of an individual in prevention of pollution.
5.4. Disaster management: Floods, earth quake, cyclone and landslides.

6. **Social issues and the Environment:**

6.1. Form unsustainable to sustainable development.
6.2. Urban problems related to energy.
6.3. Water conservation, rain water harvesting, water shed management.
6.4. Resettlement and rehabilitation of people; its problems and concern.
6.5. Environmental ethics: issue and possible solutions.
6.6. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.
6.7. Air (prevention and control of pollution) Act.
6.8. Water (prevention and control of pollution) Act.
6.9. Public awareness.

7. **Human population and the environment:**

7.1. Population growth and variation among nations.
7.2. Population explosion- family welfare program.
7.3. Environment and human health.
7.4. Human rights.
7.5. Value education
7.6. Role of information technology in environment and human health.

Syllabus coverage up to Internal assessment

Chapters: 1, 2 and 3.

Learning Resources:			
Sl.No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
1.	Textbook of Environmental studies	Erach Bharucha	#UGC
2.	Fundamental concepts in Environmental Studies	D.D. Mishra	S.Chand & Co-Ltd
3.	Text book of Environmental Studies	K.Raghavan Nambiar	SCITECH Publication Pvt. Ltd.
4.	Environmental Engineering	V.M.Domkundwar	Dhanpat Rai & Co

PR-1 DATA STRUCTURE LAB USING "C"

Total Periods	**60**	**Maximum Marks**	**75 Marks**
Lab. Periods:	**4 Periods /week**	**Term Work/Sessional**	**25 Marks**
Examination	**3hours**	**End Semester Examination**	**50Marks**

LIST OF PRACTICALS:-

1. Implementation of 1D & 2D Array
2. Implementation of Stack
3. Pointer and it's application.
4. Structure & Union
5. Implementation of insertion & deletion in Stack
6. Implementation of insertion & deletion in Queue
7. Implementation of insertion & deletion in Linked list
8. Implementation of Bubble sort
9. Implementation of Quick sort
10. Implementation of Binary tree traversal
11. Implementation of Linear search
12. Implementation of Binary search

Learning Resources:

SL.NO	Name of Authors:	Title of Book:	Name of Publisher:
1	T.R.Jagadesh	Computer lab referral for diploma students	Unv. S. Press
2	Gilburg,Forouzen	Data Structure A pseudo code approach with C	Cengage Learning
3	Reema Thareja	Data Structure using C	Oxford
4	Susanta Ku.Rout	Tips and Triks on Data Structure	Vikas

Pr3. DIGITAL ELECTRONICS LAB

Total Periods	**60**	**Total Marks**	**75 Marks**
Lab. Periods:	**4 Periods /week**	**Term Works/Sessional**	**50 Marks**
Examination	**3hours**	**Sessional**	**25 Marks**

A. Rationale:

The Digital Electronics Laboratory can play a vital role in wide Varity applications in the field of microprocessor, microcontrollers & household appliances, among others. It is the inter connection among the digital components and modules. Various digital ICs are discussed. This lab includes combinational logic & sequential logic circuits and its implementations.

B. Objective:

After completion of this course the student will be able to:

1. Familiarization of Digital Trainer Kit, logic Pulser Logic Probe & Digital ICs
2. Verify truth tables of Digital gates
3. Implement various gates by using universal properties
4. Implement Half adder, Full adder, Half subtractor and Full subtractor using logic gates.
5. Know about Flip Flop,Counters,Registers
6. Study Multiplexer and Demultiplexer.
7. Study 8-bit D/A and A/D conversion.
8. Study display devices, LED, LCD, 7-segment displays.

C. List of Practicals

1. Familiarization of Digital Trainer Kit, logic Pulser Logic Probe & Digital ICs IE 7400, 7402, 7404,7408, 7432 & 7486.(draw their pin diagram and features)

2 Verify truth tables of AND, OR, NOT, NOR, NAND, XOR, XNOR gates & simplifications of Boolean gates

3 Implement various gates by using universal properties of NAND & NOR gates verify and truth table tabulate data.

4 Construct & verify operation of Half adder and Full adder using logic gates.

5 Construct & verify operation of Half subtractor and Full subtractor using logic gates.

6 Design &Implement a 4-bit Binary to Gray code converter.

7 Design & Implement a Single bit/ two bit digital comparator circuit

8 Design Multiplexer (4:1) and De-multiplexer (1:4).

9 Study the operation of flip-flops (i)S-R flip flop (ii) J-K flip flop (iii) D flip flop (iv) T flip flop

10 Realize a 4-bit asynchronous UP/Down counter with a control for up/down counting.

11 Study shift registers.

12 verify the operation 8-bit D /A and A/ D conversion & test its performance

13 Study display devices LED, LCD, 7-segment displays.

14 Mini Project : To collect data like pin configurations, display devices, Operational characteristics, applications and critical factors etc. on all digital ICs studied in theory and compile a project report throughout and submit at the end of the semester. To assemble and tests circuits using above digital ICs with test points e.g. Digital Clock / Frequency Counter / Running Glow Light upto 999/Solar cell & Opto coupler applications.

(All the above experiments are to be conducted by through study of ICs)

15. **Digital Works 3.04/** higher version is a graphical design tool that enables you to construct digital logic circuits and to analyse their behaviour through real time simulation. Its intuitive, easy to use interface makes it the ideal choice for learning or teaching digital electronics.

PR-3 OBJECT ORIENTED PROGRAMMING USING JAVA

Total Period:	**60**	**Examination:**	**3 hr**
Lab. periods:	**4P/Week**	**Term Work:**	**25**
Maximum marks:	**50**	**End Semester Examination**	**50**

List of Practicals:-

1. Write a Java program to print 'Hello' on screen and then print your name on a separate line.
2. Write a Java program to print the sum of two numbers.

3**.** Write a Java program that takes a number as input and prints its multiplication table upto 10.

4**.** Write a Java program to print the area and perimeter of a rectangle.

5. Write a Java program to swap two variables.

6. Write a Java program to convert a decimal number to binary number.

7. Write a Java program to compare two numbers.

8. Write a Java program and compute the sum of the digits of an integer.

9. Write a Java program to count the letters, spaces, numbers and other characters of an input string.

10. Write a Java program to reverse a string.

11. Write a Java program to accept a number and check the number is even or not. Prints 1 if the number is even or 0 if the number is odd.

12. Write a Java program that accepts two integer values from the user and return the larger values. However if the two values are the same, return 0 and return the smaller value if the two values have the same remainder when divided by 6.

13. Write a Java program to get the larger value between first and last element of an array (length 3) of integers .

14. Design a class to represent a bank account. Include the following members :

Data members:

- Name of the depositor
- Account Number
- Type of account
- Balance amount in the account

Methods:

- To assign initial values
- To deposit an amount
- To withdraw an amount
- To display the name and balance

15. Given are two one-dimensional arrays, A and B which are sorted in ascending order. Write a program to merge them into a single sorted array C that contains every item from arrays A and B, in ascending order.

16. Write a java program implementing multiple inheritance.

17. Write a java program implementing package.

18. Write a java program to read a file line by line and print the line on the output screen.

19. Write a java program to read content from one file and write it into another file.

20. Define an exception called “No Match Exception” that is thrown when a string is not equal to “India”. Write a program that uses this exception.

21. Develop a java project for percentage calculator/temperature conversion tool.

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of Publisher:
01	E. Balagurusami	Programming With Java: A Primer	The McGraw-Hill Companies
02	Patric Naughton Herbert Schildt	Java™ 2: The Complete Reference	Tata McGraw-Hill Publishing Company Limited
03	Rashmi Kanta Das	Core Java For Beginners	Vikas Publishing
04	Herbert Schildt	Java: A Beginner’s Guide	McGraw-Hill Education
05	Cay S. Horstmann	Core Java Volume I - Fundamentals	Prentice Hall

Pr.4- OFFICE AUTOMATION LAB

Total Period	**60**	**Examination**	**3hr**
Lab. periods	**4P/Week**	**Term Work**	**25**
Maximum Marks	**50**	**End Semester Examination**	**25**

List of Assignments (MS Word)

1. Create a news-paper document with at least 200 words,
    a. Use margins as, top:1.5, bottom:2, left:2, right:1 inches.
    b. Use heading “Gandhi Jayanti”, font size: 16, font color: red, font face: Arial Black.
    c. With first letter “dropped” (use drop cap option) of the first paragraph containing a picture at the right side
    d. Use three columns from the second paragraph onwards till the half of the page.
    e. Then use heading “Computer basics”
    f. Create paragraph using two columns till the end of the page.
2. Create a Mathematical question paper using, at least five equations
    a. With fractions, exponents, summation function
    b. With at least one ‘m*n’ matrix
    c. Basic mathematical and geometric operators.
    d. Use proper text formatting, page color and page border.
3. Create a flowchart using,
    a. Proper shapes like ellipse, arrows, rectangle, and parallelogram.
    b. Use grouping to group all the parts of the flowchart into one single object.
4. Create a table using table menu with,
    a. At least 5 columns and 10 rows.
    b. Merge the first row into one cell.
    c. Merge the second row into one cell, then split the second row into three cells.
    d. Use proper table border and color.
    e. Insert proper content into the table with proper text formatting.
5. Create a table using two columns,
    a. The left column contains all the short-cut keys and right side column contains the function of the short-cut keys.
    b. Insert a left column using layout option. Name the heading as Serial No.
6. Create two letters with the following conditions in Ms Word and find the difference.
    a. Write a personal letter to your friend using at least 100 words and two paragraphs. The date must be in top-right corner. Use ‘justify’ text-alignment and 1.5 line spacing for the body of the letter. Letter must contain proper salutation and closing.
    b. Use step by step mail-merge wizard to design a letter. (Mailing → step by step mail merge wizard→letters→start from a template→select template→ letters→select proper template→ create new document→OK)
7. Create a letter, which must be sent to multiple recipients.
    a. Use Mail-Merge to create the recipient list.

b. Use excel sheet to enter the recipient.
c. Start the mail merge using letter and directory format. State the difference.

List of Assignments (MS Excel)

1. Create a table “Student result” with following conditions.
   a. The heading must contain, Sl. No., Name, Mark1, Mark2, Mark3, Total, average and result with manual entry.
   b. Use formulas for total and average.
   c. Find the name of the students who has secured the highest and lowest marks.
   d. Round the average to the nearest highest integer and lowest integer (use ceiling and floor function respectively).
2. Do as directed
   a. Create a notepad file as per the following fields

   Slno name th1 th2 th3 th4 th5 total % grade
   b. Import this notepad file into excel sheet using ‘data→from text’ option.
   c. Grade is calculated as,
      i. If %>=90, then grade A
      ii. If %>=80 and <90, then grade B
      iii. If %>=70 and <80, then grade C
      iv. If %>=60 and <70, then grade D
      v. If %<60, then grade F
3. Create a sales table using the following data,

Item	Year1	Year2	Year3	Year4
Item1	1000	1050	1100	1200
Item2	950	1050	1150	1200
Item3	1100	1200	1200	1300

   a. Draw the bar-graph to compare the sales of the three items for four years using insert option.
   b. Draw a line-graph to compare the sales of three items for four years using insert option.
   c. Draw different pie-charts for the given data using insert option.
   d. Use condition, to highlight all the cells having value >=1000 with red color (use conditional formatting).

List of Assignments (MS PowerPoint)

1. Create a power-point presentation with minimum 5 slides.
   a. The first slide must contain the topic of the presentation and name of the presentation.
   b. Must contain at least one table.
   c. Must contain at least 5 bullets, 5 numbers.
   d. The heading must be, font size:32, font-face: Arial Rounded MT Bold, font-color: blue.
   e. The body must be, font size: 24, font-face: Comic Sans MS, font-color: green.
   f. Last slide must contain ‘thank you’.
2. Create a power-point presentation with minimum 10 slides

a. Use word art to write the heading for each slides.
b. Insert at least one clip-art, one picture
c. Insert at least one audio and one video
d. Hide at least two slides

3. Create a power-point presentation with minimum 5 slides
    a. Use custom animation option to animate the text; the text must move left to right one line at a time.
    b. Use proper transition for the slides.

List of Assignments (MS Access)

1. Create a database “Student” with,
    a. At least one table named “mark sheet” with field name “student name, roll number, mark1, mark2, mark3, mark4, total”
    b. The data types are, student name: text, roll number: number, mark1 to mark4: number, total: number. Roll number must be the primary key.
    c. Enter data in the table. The total must be calculated using update query.
    d. Use query for sorting the table according to the descending/ascending order of the total marks.
2. With addition to the table above,
    a. Add an additional field “result” to the “mark sheet” table.
    b. Enter data for at least 10 students
    c. Calculate the result for all the students using update queries, if total>=200, then pass, else fail.
    d. Search the students, whose name starts with “sh”.
    e. Show the names and total marks of the students who have passed the examination.

Book Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of Publisher
1	Vikas Gupta	Comdex 14-1in-1 Computer course Kit	Dream Tech
2	Bittu Kumar	Master in Ms-Office	

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA									
TEACHING AND EVALUATION SCHEME FOR 4th Semester (Computer Sc.&Engg.)(wef 2019-20)									
Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	EndSem Exams	Exams (Hours)	Total
		Theory							
Th.1		Operating System	04		-	20	80	03	100
Th.2		Data Communication and Computer Network	04		-	20	80	03	100
Th.3		Microprocessor & Microcontroller	05		-	20	80	03	100
Th.4		Database Management System	04			20	80	03	100
		Total	*17*			*80*	*320*	-	*400*
		Practical							
Pr.1		Operating System Lab	-	-	03	25	25	03	50
Pr.2		Networking Lab	-	-	06	50	50	03	100
Pr.3		Microprocessor Microcontroller Lab			04	25	25	03	50
Pr.4		Database Management System Lab	-	-	04	50	50	03	100
Pr.5		Technical Seminar			02	50			50
		Student Centered Activities(SCA)		-	03	-	-		
		Total	-	-	*23*	*200*	*150*	-	*350*
		Grand Total	**17**		**22**	**280**	**470**	**-**	**750**
Abbreviations: L-Lecturer, T-Tutorial, P-Practical . Each class is of minimum 55 minutes duration.									
Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%									
SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAMetc. ,Seminar and SCA shall be conducted in a section.									
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester.									

Th.1-OPERATING SYSTEM
COMMON TO (CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTRODUCTION	03
2	PROCESS MANAGEMENT	10
3	MEMORY MANAGEMENT	10
4	DEVICE MANAGEMENT	10
5	DEAD LOCKS	10
6	FILE MANAGEMENT	10
7	SYSTEM PROGRAMMING	07
	TOTAL	**60**

B. Rationale:

The course provides the students with an understanding of Human computer interface existing in computer system and the basic concepts of Operating System and its working. The students will gather knowledge about efficient utilization of the resources to obtain optimization processing.

C. Objective:

After completion of this course the student will be able to**:**

- Understand the concept and function of operating system.
- Understand notion of a process and all computation.
- To introduce the critical – section problem whose solutions can be used to ensure the consistency of the shared data.
- Understand the concept of deadlock, its avoidance prevention and recovery.
- To provide a detailed description of various memory management techniques.
- To describe the benefits of a virtual memory system.
- To explain the function of file system.
- To describe the details of implementing local file systems and directory structures.
- Understand the brief idea of Systems Programming.

D. DETAIL CONTENTS:

1. INTRODUCTION

1.1 Objectives and Explain functions of operating system.
1.2 Evolution of Operating system
1.3 Structure of operating system.

2. PROCESS MANAGEMENT

2.1 Process concept, process control, interacting processes, inter process messages.
2.2 Implementation issues of Processes.
2.3 Process scheduling, job scheduling.
2.4 Process synchronization, semaphore.
2.5 Principle of concurrency, types of scheduling.

3. MEMORY MANAGEMENT

3.1 Memory allocation Techniques

- Contiguous memory allocation
- non contiguous memory allocation

3.2 Swapping

3.3 Paging

Segmentation, virtual memory using paging,

3.4 Demand paging, page fault handling.

4. DEVICE MANAGEMENT

4.1 Techniques for Device Management

- Dedicated,
- shared and
- virtual.

4.2 Device allocation considerations I/O traffic control & I/O Schedule, I/O Device handlers.

4.3 SPOOLING.

5. DEAD LOCKS

5.1 Concept of deadlock.

5.2 System Model

5.3 Dead Lock Detection

5.4 Resources allocation Graph

5.5 Methods of Deadlock handling

5.6 Recovery &Prevention, Explain Bankers Algorithm & Safety Algorithm

6. FILE MANAGEMENT

6.1 File organization, Directory & file structure, sharing of files

6.2 File access methods, file systems, reliability

6.3 Allocation of disk space

6.4 File protection, secondary storage management.

7.0 SYSTEM PROGRAMMING 7.1

Concept of system programming and show difference from Application Complier:

7.2 Compiler , functions of compiler.

7.3 Compare compiler and interpreter.

7.4 Seven phases of compiler, brief description of each phase.

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1	Donovan	Operating System	TMH
2	Silverschz& Galvin,	Operating System	PHI
3	Er.Rajiv Chopra	Operating System	S.CHAND

TH-2 DATA COMMUNICATION & COMPUTER NETWORK

(Common to CSE/IT**)**

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	NETWORK& PROTOCOL	08
2	DATA TRANSMISSION & MEDIA	08
3	DATA ENCODING	08
4	DATA COMMUNICATION & DATA LINK CONTROL	08
5	SWITCHING & ROUTING	10
6	LAN TECHNOLOGY	10
7	TCP/IP	08
	TOTAL	**60**

B. RATIONALE: Now a days the growth of data communication technology has become very fast in development of various application areas. This subject will expose the learner to have an idea about the architecture computer network and different protocols to be followed to communicate. Further they will have an idea about different mode of communication.

C. OBJECTIVE: After completion of this course the student will be able to**:**

- Know the concepts of Data Communication, networking, protocols, and networking models
- Know the various transmission Medias
- Understand the concepts of switching
- Understand various Error detection and correction methods
- Know about data flow and error control
- Know about data link control
- Understand multiple access
- Learn the concepts of wired LANs and Ethernet
- Compare various connecting devices
- Know the concepts of network layer, logical addressing, IP, Forwarding and routing
- Understand brief concept on TCP/IP

D.CORSE CONTENTS:

1. Network& Protocol

1.1 Data Communication
1.2 Networks
1.3 Protocol & Architecture, Standards, OSI, TCP/IP

2. Data Transmission & Media

2.1 Data transmission Concepts and Terminology
2.2 Analog and Digital Data transmission
2.3 Transmission impairments, Channel capacity
2.4 Transmission media, Guided Transmission, Wireless Transmission

3. Data Encoding

3.1 Data encoding,
3.2 Digital data digital signals,
3.3 Digital data analog signals
3.4 Analog data digital signals
3.5 Analog data analog signals

4. Data Communication & Data link control

4.1 Asynchronous and Synchronous Transmission
4.1 Error Detection
4.3 Line configuration
4.4 Flow Control,
4.5 Error Control
4.6 Multiplexing
4.7 FDM synchronous TDM
4.8 Statistical TDM

4 Switching & Routing

5.1 Circuit Switching networks
5.2 Packet Switching principles
4.3 X.25
4.4 Routing in Packet switching
4.5 Congestion
4.6 Effects of congestion, congestion control
4.7 Traffic Management
4.8 Congestion Control in Packet Switching Network.

6. LAN Technology

6.1. Topology and Transmission Media
6.2 LAN protocol architecture
6.3. Medium Access control
6.4 Bridges, Hub, Switch
6.5 Ethernet (CSMA/CD), Fiber Channel
6.6 Wireless LAN Technology..

7. TCP/IP

7.1 TCP/IP Protocol Suite
7.2 Basic Protocol functions
7.3 Principles of Internetworking
7.3 Internet Protocol operations
7.4 Internet Protocol

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	W.Stallings	Data Communication &Computer Networks	PHI
02	M.Bhatia	Introduction to Comp. Network	Unv. S. Press
03	Forouzen	Data Communication & Network	TMH

Th.3- MICROPROCESSOR & MICROCONTROLLER

(Common ETC, AE&I, CSE & IT)

Theory	**5 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**75 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Chapter wise Distribution of periods with Total periods

Sl.No.	Topics	Periods
1.	Microprocessor(Architecture and Programming-8 bit-8085)	15
2.	Instruction Set and Assembly Language Programming(8 bit)	15
3.	TIMING DIAGRAMS	07
4.	Microprocessor Based System Development Aids	11
5.	Microprocessor (Architecture and Programming-16 bit-8086)	12
6.	Microcontroller (Architecture and Programming-8 bit)	15
	TOTAL	75

B. Rationale:

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have been included through the interfacing chips. Microcontroller (MC) may be called computer on the chip since it has basic features of a microprocessor with internal ROM, RAM, Parallel and serial ports within a single chip. Or we can say microprocessor with memory and ports is called as a microcontroller. Microcontroller is a programmable digital processor with necessary peripherals. Both microcontrollers and microprocessors are complex sequential digital circuits meant to carry out job according to the program / instructions. Sometimes analog input/output interface makes a part of microcontroller circuit of mixed mode(both analog and digital nature).

C. Objective:

After completion of this course the student will be able to:

1. The students will able to differential between 8085 microprocessor &types of Bus.
2. Describe the Architecture & pin diagram of 8085 microprocessor.
3. Comprehend different instructions of 8085 microprocessor &addressing modes.
4. Write instructions under different addressing modes.
5. Discuss assembler & basic assembler directives.
6. Describe types of assembly language programs and write programs.
7. Explain the timing diagrams of different instructions.
8. State the functions of the interfacing chips like 8255, etc.
9. Explain the delay subroutine &calculate the delay by using one, two or three registers.
10. Explain ADC & DAC?&use of ADC & DAC modules
11. Write a program for traffic light control &stepper motor control.
12. Know about 16-bit microprocessor.

D. Detailed Contents:

Unit-1:Microprocessor (Architecture and Programming-8 bit-8085)

1.1 Introduction to Microprocessor and Microcomputer & distinguish between them.
1.2 Concept of Address bus, data bus, control bus & System Bus
1.3 General Bus structureBlockdiagram.
1.4 Basic Architecture of 8085 (8 bit) Microprocessor
1.5 Signal Description (Pin diagram) of 8085 Microprocessor
1.6 Register Organizations,Distinguish between SPR & GPR, Timing & Control Module,
1.7 Stack, Stack pointer & Stack top.
1.8 Interrupts:-8085 Interrupts, Masking of Interrupt(SIM,RIM)

Unit-2: Instruction Set and Assembly Language Programming

2.1 Addressing data & Differentiate between one-byte, two-byte &three-byte instructions with examples.
2.2 Addressing modes in instructions with suitable examples.
2.3 Instruction Set of 8085(Data Transfer, Arithmetic, Logical, Branching, Stack& I/O , Machine Control)
2.4 Simple Assembly Language Programming of 8085
- 2.4.1 Simple Addition & Subtraction
- 2.4.2 Logic Operations (AND, OR, Complement 1's & 2's) & Masking of bits
- 2.4.3 Counters & Time delay (Single Register, Register Pair, More than Two Register)
- 2.4.4 Looping, Counting & Indexing (Call/JMP etc).
- 2.4.5 Stack & Subroutinesprogrames.
- 2.4.6 Code conversion, BCD Arithmetic & 16 Bit data Operation, Block Transfer.
- 2.4.7 Compare between two numbers
- 2.4.8 Array Handling (Largest number & smallest number in the array)

2.5 Memory & I/O Addressing,

Unit-3: TIMING DIAGRAMS.

1.1 Define opcode, operand, T-State, Fetch cycle, Machine Cycle, Instruction cycle & discuss the concept of timing diagram.
1.2 Draw timing diagram for memory read, memory write, I/O read, I/O write machine cycle.
1.3 Draw a neat sketch for the timing diagram for 8085 instruction (MOV,MVI,LDA instruction).

Unit-4 Microprocessor Based System Development Aids

4.1 Concept of interfacing
4.2 Define Mapping &Data transfer mechanisms - Memory mapping & I/O Mapping
4.3 Concept of Memory Interfacing:- Interfacing EPROM & RAM Memories
4.4 Concept of Address decoding for I/O devices
4.5 Programmable Peripheral Interface: 8255
4.6 ADC & DAC with Interfacing.
4.7 Interfacing Seven Segment Displays
4.8 Generate square waves on all lines of 8255
4.9 Design Interface a traffic light control system using 8255.
4.10 Design interface for stepper motor control using 8255.

Unit-5 Microprocessor (Architecture and Programming-16 bit-8086)

5.1 Register Organisation of 8086

5.2 Internal architecture of 8086
5.3 Signal Description of 8086
5.4 General Bus Operation& Physical Memory Organisation
5.5 Minimum Mode &Timings,
5.6 Maximum Mode &Timings,
5.7 Interrupts and Interrupt Service Routines, Interrupt Cycle, Non-Maskable Interrupt, Maskable Interrupt
5.8 8086 Instruction Set & Programming: Addressing Modes, Instruction Set, Assembler Directives and Operators,
5.9 Simple Assembly language programming using 8086 instructions.

Unit-6 Microcontroller (Architecture and Programming-8 bit):-

6.1 Distinguish between Microprocessor & Microcontroller
6.2 8 bit & 16 bit microcontroller
6.3 CISC & RISC processor
6.4 Architectureof8051Microcontroller
6.5 Signal Descriptionof8051Microcontrollers
6.6 Memory Organisation-RAM structure, SFR
6.7 Registers,timers,interruptsof8051Microcontrollers
6.8 Addressing Modes of 8051
6.9 Simple 8051 Assembly Language Programming Arithmetic& Logic Instructions , JUMP, LOOP, CALL Instructions, I/O Port Programming
6.10 Interrupts, Timer & Counters
6.11 Serial Communication
6.12 Microcontroller Interrupts and Interfacing to 8255

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended

1. *Microprocessor architecture, programming & application with 8085 by R.S. Gaonkar, PenramInternational Publishing. (India) Pvt. Ltd.*
2. *The 8051 Microcontroller & Embedded Systems by Mazidi & Mazidi, - Pearson publication*
3. *Advanced Microprocessor and Peripherals (Architecture, Programming & Interfacing) by A.K. Roy & K.M. Bhurchandi, - TMH Publication*
4. *Microprocessor & Microcontroller by N.SenthliKumar,M.Sarvanan,S.Jeevananthan,S K Shah- OXFORD*
5. *Microprocessor & Microcontroller by R.S. Kaler, IKI Publishing*
6. *Microprocessor & its application by B.Ram,Dhanpat rai*
7. *Microcontroller, Theory and application by Ajaya V. Deshmukh. TMH*

Th.4-DATABASE MANAGEMENT SYSTEM

COMMON TO (CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	BASIC CONCPETS OF DBMS	05
2	DATA MODELS	08
3	RELATIONAL DATABASE	06
4	NORMALIZATION IN RELATIONAL SYSTEM	08
5	STRUCTURED QUERY LANGUAGE	09
6	TRANSACTION PROCESSING CONCEPTS	08
7	CONCURRENCY CONTROL CONCEPTS	08
8	SECURITY AND INTEGRITY	08
	TOTAL	**60**

B. RATIONALE: Databases are wonderful learning tools because they embody so much of the learning process. It is the vital component of modern information system which needs to store and process large volume of data. It gives an idea about accessing of data and shared by different application programs. The architecture of the database is simple to understand.

C. OBJECTIVE: After completion of this course the student will be able to**:**

- Understand the database concepts, their benefits and advantages
- Understand the Database architecture
- Understand the concepts of E-R diagrams & E-R modeling
- Understand relational algebra
- Comprehend the different aspects of SQL
- Understand the concepts of normalization
- Understand the concepts of transaction processing
- Understand the techniques of concurrency control
- Comprehend the concepts & techniques of backup & recovery of database.
- Understand how to maintain security and integrity in database.

D.COURSE CONTENTS:

1.0 BASIC CONCPETS OF DBMS

1.1 Purpose of database Systems
1.2 Explain Data abstraction
1.3 Database users
1.4 Data definition language
1.5 Data Dictionary

2.0 DATA MODELS

2.1 Data independence
2.2 Entity relationship models
2.3 Entity sets and Relationship sets 2.4 Explain Attributes
2.5 Mapping constraints

2.6 E-R Diagram
2.7 Relational model
2.8 Hierarchical model
2.9 Network model

3.0 RELATIONAL DATABASE

3.1 Relational algebra
3.2 Different operators select, project, join , simple Examples

4.0 NORMALIZATION IN RELATIONAL SYSTEM

4.1 Functional Dependencies
4.2 Lossless join
4.3 Importance of normalization
4.4 Compare First second and third normal forms 4.5 Explain BCNF

5.0 STRUCTURED QUERY LANGUAGE

5.1 Elementary idea of Query language
5.2 Queries in SQL
5.3 Simple queries to create, update, insert in SQL

6.0 TRANSACTION PROCESSING CONCEPTS

6.1 Idea about transaction processing
6.2 Transaction & system concept
6.3 Desirable properties of transaction
6.4 Schedules and recoverability

7.0 CONCURRENCY CONTROL CONCEPTS
7.1 Basic concepts,
7.2 Locks, Live Lock, Dead Lock,
7.3 Serializability (only fundamentals)

8.0 SECURITY AND INTEGRITY

8.1 Authorization and views
8.2 Security constraints
8.3 Integrity Constraints 8.4 Discuss Encryption

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	Rog,Cornel	Database System Concepts	Cengage Learning
02	Prateek Bhatia	Data Base System	Kalyani Publications
03	A. Silberschatz, H.F. Korth	Database System Concepts	TMH Publication
04	C.J. Date	An Introduction to Database Systems	Norosa Publication

Pr.1-OPERATING SYSTEM LAB

Total Periods	**60**	**Maximum Marks**	**50 Marks**
Lab. Periods:	**4 Periods /week**	**Term Works**	**25 Marks**
Examination	**3hours**	**End Semester Examination**	**25Marks**

A. LIST OF PRACTICALS:-

1. Write a Shell script to print the command line arguments in reverse order.
2. Write a Shell script to check whether the given number is palindrome or not.
3. Write a Shell script to sort the given array elements in ascending order using bubble sort.
4. Write a Shell script to perform sequential search on a given array elements.
5. Write a Shell script to perform binary search on a given array elements.
6. Write a Shell script to accept any two file names and check their file permissions.
7. Write a Shell script to read a path name, create each element in that path e.g: a/b/c i.e., 'a' is directory in the current working directory, under 'a' create 'b', under 'b' create 'c'.
8. Write a Shell script to illustrate the case-statement.
9. Write a Shell script to accept the file name as arguments and create another shell script, which recreates these files with its original contents.
10. Write a Shell script to demonstrate Terminal locking.
11. Write a Shell script to accept the valid login name, if the login name is valid then print its home directory else an appropriate message.
12. Write a Shell script to read a file name and change the existing file permissions.
13. Write a Shell script to print current month calendar and to replace the current day number by '*' or '**' respectively.
14. Write a Shell Script to display a menu consisting of options to display disk space, the current users logged in, total memory usage, etc. (using functions.)
15. Write a C-program to fork a child process and execute the given Linux commands.
16. Write a C-program to fork a child process, print owner process ID and its parent process ID.
17. Write a C-program to prompt the user for the name of the environment variable, check its validity and print an appropriate message.
18. Write a C-program to READ details of N students such as student name, reg number, semester and age. Find the eldest of them and display his details.

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1	Sumitabha Das, 4th Edition,	"UNIX – Concepts and Applications",	Tata McGraw Hill, 2006.
3	Yashvant Kanetkar	Unix Sell Programming 1st edition	BPB Publication

Pr.2 NETWORKING LAB

Total Periods	**90**	**Maximum Marks**	**100 Marks**
Lab. Periods:	**6 Periods /week**	**Term Works**	**50 Marks**
Examination	**3hours**	**End Semester Examination**	**50Marks**

A. LIST OF PRACTICALS:-

1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network.
2. Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST
3. Making of cross cable and straight cable
4. Install and configure a network interface card in a workstation.
5. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation
6. Managing user accounts in windows and LINUX
7. Sharing of Hardware resources in the network.
8. Use of Netstat and its options.
9. Connectivity troubleshooting using PING, IPCONFIG
10. Installation of Network Operating System(NOS)
11. Create a network of at least 6 computers.
12. Study of Layers of Network and Configuring Network Operating System
13. Study of Routing and Switching, configuring of Switch and Routers, troubleshooting of networks
14. Study of Scaling of Networks, Design verities of LAN and forward of Traffic
15. Study WAN concepts and Configure and forward Traffic in WAN
16. Configure IPv4 and IPv6 and learn Quality, security and other services
17. Learn Network programming
18. Troubles shoot Networks.

Pr.3 - MICROPROCESSOR & MICROCONTROLLER LAB

(Common to ETC,AE&I,CSE & IT)

Total Periods	**60**	**Maximum Marks**	**50 Marks**
Lab. Periods:	**4 Periods /week**	**Term Works**	**25Marks**
Examination	**3hours**	**End Semester Examination**	**25 Marks**

A. Rationale:

The Microprocessor control has taken predominance over other types of control quite some time past. Starting from Electrical Power plant to consumer electronics this tiny chip finds extensive uses. As such Microprocessors have made pervading influence on our lives. This field is developing so rapid that it is difficult to keep track with the changes. Under this subjects Architecture and instruction sets of 8 bit and 16 bit processor have been discussed. Some applications have been included through the interfacing chips.

B. Objective:

After completion of this course the student will be able to:

1. The concept of Microprocessor 8085 (8Bit)
2. Concept of 16 Bit Processor 8086
3. Programming & Interfacing Concept
4. Develop software for microcontroller systems using a high-level programming language
5. Demonstrate familiarity with common microcontroller subsystems, such as timer modules
6. Demonstrate an ability to use both polling and interrupt-driven approaches for interfacing a microcontroller with peripheral devices
7. Develop and analyze software to interface a microcontroller with common peripheral devices, such as switches, visual displays, digital-to-analog converters, analog-to-digital converters, and flash memory to produce a system to accomplish a specified task
8. Design interfaces to external devices connected to the microcontroller using a standard bus

C. List of Practicals

NOTE: Total 14 Experiments Have To Be Completed. (4 from Gr - A ,3 from Gr - B , 4 from Gr - C, 3 from Gr - D)

Gr A) 8085(Compulsory)

1. Addition, Subtraction, Multiplication, Division of two 8 bit numbers resulting 8/16 bit numbers.

Optional (Any three)

2. 1''s and 2's Complements
3. Binary to Gray Code / Hexadecimal to decimal conversion.
4. Logic Operations (AND, OR,) & Masking of bits
5. Time delay (Single Register, Register Pair, More than Two Register)
6. Compare between two numbers
7. Smallest /Largest number among n numbers in a given data array
8. Block Transfer of data

Gr B) 8086(Compulsory)

1. Addition, subtraction, Multiplication, Division of 16 bit nos + 2's complement of a 16 bit no.

Optional (Any two)

2. Marking of specific bit of a number using look-up table.
3. Largest /Smallest number of a given data array.
4. To separate the Odd and Even numbers from a given data array.

5. Sorting an array of numbers in ascending/descending order
6. Finding a particular data element in a given data array.

Gr-C) INTERFACING (Compulsory-any one)

1. Operation of 8255 using 8085 & 8051 microcontroller
2. Generate square waves on all lines of 8255 with different frequencies (concept of delay program)

OPTIONAL (Any Three) based on self-study

1. Study of stepper Motor and its operations (Clockwise, anticlockwise, angular movement, rotate in various speeds)
2. Study of Elevator Simulator
3. Generation of Square, triangular and saw tooth wave using Digital to Analog Converter
4. Study of 8253 and its operation (Mode 0, Mode 2, Mode 3)
5. Study of Mode 0, Mode 1, BSR Mode operation of 8255.
6. Study of 8279 (keyboard & Display interface)
7. Study of 8259 Programmable Interrupt controller.
8. Study of Traffic Light controller
9. Steeper Motor Controller.

Gr-D) 8051 MICROCONTROLLER (Compulsory) by self-study

1. Initialize data to registers and memory using immediate, register, direct and indirect addressing mode

OPTIONAL (any two)

2. Write a Program for
   2.1 Bit Digital Output-LED Interface
   2.2 8 Bit Digital Inputs (Switch Interface)
3. Write a Programs for(Any one)
   3.1 4 x 4 Matrix Keypad Interface
   3.2 Buzzer Interface
   3.3 Relay Interface
4. Write a Program for character based LCD Interface.
5. Write a Program for Analog to Digital Conversion (On chip ADC& DAC)
6. Interfacing With Temperature Sensor.
7. Write a program Stepper Motor Interface
8. Write a program to Generate Delay Subroutine
9. 805 Timer & Counter programming –Generate Square wave

Pr.4-DATABASE MANAGEMENT SYSTEM LAB

Total Periods	**60**	**Maximum Marks**	**100 Marks**
Lab. Periods:	**4 Periods /week**	**Term Works**	**50 Marks**
Examination	**3hours**	**End Semester Examination**	**50Marks**

A. ASSINGMENT FOR DBMS LAB

1. Show the Structure of DEPT. Select all data from DEPT table. Create a query to display unique jobs from the EMP table.
2. Write a query to Name the column headings EMP#, Employee, Job and Hire date, respectively. Run the query.
3. Create a query to display the Name and salary of employees earning more than Rs.2850.Save the query and run it.
4. Create a query to display the employee name and department no. for employee no. 7566.
5. Display the employee name, job and start date of employees hire date between Feb.20.1981 and May 1, 1981. Order the query in ascending order of start date.
6. Display the name and title of all employees who don't have a Manager.
7. Display the name, salary and comm. For all employee who earn comm. Sort data in descending order of salary and comm.
8. Display the name job, salary for all employees whose job is Clerk or Analyst their salary is not equal to Rs.1000, Rs.3000, Rs.5000.
9. Write a query to display the date. Label the column DATE.
10. Create a unique listing of all jobs that are in department 30.
11. Write a query to display the name, department number and department name for all employees.
12. Write a query to display the employee name, department name, and location of all employee who earn a commission.
13. Write a query to display the name, job, department number and department name for all employees who works in DALLAS.
14. Write a query to display the number of people with the same job. Save the query @ run it.
15. Create a query to display the employee name and hire date for all employees in same department.
16. Display the employee name and salary of all employees who report to KING.
17. Display the mane, department name and salary of any employee whose salary and commission matches both the salary and commission of any employee located in DALLAS.
18. Create a student database table using create command using Regd. No as Primary Key , insert data of your class.
19. Delete the information of student having roll No -15 and City- Bhubaneswar. Rename the Student database table to STUDENT INFORMATION.
20. Practice of all Data Retrieval, DML, DDL, TCL and DCL commands used in Oracle by writing queries.

Pr.5 -TECHNICAL SEMINAR

Total Periods	**02**	**Maximum Marks**	**50 Marks**
Lab. Periods:	**02Periods /week**	**Term Works**	**50Marks**
Examination		**End Semester Examination**	**--**

A. Objective:

Each student has to select a recent topic of latest technology in the area of Computer Science and present a seminar in front of all students of the class. He/She has to prepare a PowerPoint presentation of the selected topic of minimum 10 slides are the total presentation will be approximately 10 minutes duration .There will be interactive session between the presenter and rest of the students including the faculty members of the dept at the end of presentation .A student has to present at least 2 nos.of seminar during a semester and to submit the report for evaluation.

Equipments

Hardware & Tools:

PC with i5 or above with latest configuration- 30 Nos.(minimum)
Laptop: 1No.
UPS as per needs
Crimping tool, Cable tester,
RJ 45 connectors, RJ-11, BNC, SCST
Coaxial Cable, UTP, STP, OFC cable
Screw Driver Kit
Switch/Hub- 3 Nos.
Router – 1No.
8085 MP kit- 10 Nos.
8086 MP kit- 10 Nos
8051 MC kit-10 Nos.
8255 PPI- 10 Nos.
8279 KBI -10 Nos.
8259 PIC 10 Nos.
Stepper motor- 3 Nos.
Other Interfacing device/Kits-5 sets of each

Software

- Windows Server/Linux Server
- Oracle 10 g or above (Multiuser with 30 user license or 30 Nos. single user)
- Linux

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA									
TEACHING AND EVALUATION SCHEME FOR 5th Semester (CSE) (wef 2020-21)									
Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	End Sem Exams	Exams (Hours)	Total
		Theory							
Th.1		Entrepreneurship and Management Smart Technology	4		-	20	80	3	100
Th.2		Internet and Web Technology*	4		-	20	80	3	100
Th.3		Software Engineering*	4		-	20	80	3	100
Th.4		Computer Hardware and Maintenance	4			20	80	3	100
Th.5		Mobile Computing*	4			20	80	3	100
		Total	20			100	400	-	500
		Practical							
Pr.1		Web Development Lab	-	-	4	25	50		75
Pr.2		Computer Hardware Maintenance Lab	-	-	4	25	50		75
Pr.3		Python Programming Lab			4	25	50		75
Pr.4		Project Phase-I	-	-	4	25	-		25
		Student Centered Activities(SCA)		-	3	-	-	-	-
		Total	-	-	*19*	*100*	*150*	-	*250*
		Grand Total	**20**		**19**	**200**	**550**	**-**	**750**
Abbreviations: L-Lecturer, T-Tutorial, P-Practical . Each class is of minimum 55 minutes duration									
Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%									
SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAM etc. ,Seminar and SCA shall be conducted in a section.									
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester									

Th1. ENTREPRENEURSHIP and MANAGEMENT & SMART TECHNOLOGY

(Common to all Branches)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

Topic Wise Distribution of Periods

Sl No.	Topic	Periods
1	Entrepreneurship	10
2	Market Survey and Opportunity Identification(Business Planning)	8
3	Project report Preparation	4
4	Management Principles	5
5	Functional Areas of Management	10
6	Leadership and Motivation	6
7	Work Culture, TQM & Safety	5
8	Legislation	6
9	Smart Technology	6
	TOTAL	60

RATIONALE

In the present day scenario, it has become imperative to impart entrepreneurship and management concepts to students, so that a significant percentage of them can be directed towards setting up and managing their own small enterprises. It may be further added that an entrepreneurial mind set with managerial skill helps the student in the job market. The students can also be introduced with Startup and Smart Technology concept, which shall radically change the working environment in the coming days in the face of Industry 4.0

In this subject, the Students shall be introduced/ exposed to different concepts and Terminologies in brief only, so that he/she can have broad idea about different concepts/items taught in this subject. Solving numerical problem on any topic/item is beyond the scope of this subject.

OBJECTIVES

After undergoing this course, the students will be able to :

- Know about Entrepreneurship, Types of Industries and Startups
- Know about various schemes of assistance by entrepreneurial support agencies
- Conduct market survey
- Prepare project report
- know the management Principles and functional areas of management
- Inculcate leadership qualities to motivate self and others.
- Maintain and be a part of healthy work culture in an organisation.
- Use modern concepts like TQM
- Know the General Safety Rules
- Know about IOT and its Application in SMART Environment.

DETAILED CONTENTS

1. **Entrepreneurship**
   - Concept /Meaning of Entrepreneurship
   - Need of Entrepreneurship
   - Characteristics, Qualities and Types of entrepreneur, Functions
   - Barriers in entrepreneurship
   - Entrepreneurs vrs. Manager
   - Forms of Business Ownership: Sole proprietorship, partnership forms and others

- Types of Industries, Concept of Start-ups
- Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc.
- Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks

2. **Market Survey and Opportunity Identification (Business Planning)**

- Business Planning
- SSI, Ancillary Units, Tiny Units, Service sector Units
- Time schedule Plan, Agencies to be contacted for Project Implementation
- Assessment of Demand and supply and Potential areas of Growth
- Identifying Business Opportunity
- Final Product selection

3. **Project report Preparation**

- Preliminary project report
- Detailed project report, Techno economic Feasibility
- Project Viability

4. **Management Principles**
- Definitions of management
- Principles of management
- Functions of management (planning, organising, staffing, directing and controlling etc.)
- Level of Management in an Organisation

5. **Functional Areas of Management**

a) Production management
- Functions, Activities
- Productivity
- Quality control
- Production Planning and control

b) Inventory Management
- Need for Inventory management
- Models/Techniques of Inventory management

c) Financial Management
- Functions of Financial management
- Management of Working capital
- Costing (only concept)
- Break even Analysis
- Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book, P&L Accounts, Balance Sheets(only Concepts)

d) Marketing Management
- Concept of Marketing and Marketing Management
- Marketing Techniques (only concepts)
- Concept of 4P s (Price, Place, Product, Promotion)

e) Human Resource Management
- Functions of Personnel Management
- Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages

6. **Leadership and Motivation**

a) Leadership
- Definition and Need/Importance
- Qualities and functions of a leader

- Manager Vs Leader
- Style of Leadership (Autocratic, Democratic, Participative)

b) Motivation
- Definition and characteristics
- Importance of motivation
- Factors affecting motivation
- Theories of motivation (Maslow)
- Methods of Improving Motivation
- Importance of Communication in Business
- Types and Barriers of Communication

7. **Work Culture, TQM & Safety**
- Human relationship and Performance in Organization
- Relations with Peers, Superiors and Subordinates
- TQM concepts: Quality Policy, Quality Management, Quality system
- Accidents and Safety, Cause, preventive measures, General Safety Rules , Personal Protection Equipment(PPE)

8. **Legislation**

a) Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights
b) Features of Factories Act 1948 with Amendment (only salient points)
c) Features of Payment of Wages Act 1936 (only salient points)

9. **Smart Technology**
- Concept of IOT, How IOT works
- Components of IOT, Characteristics of IOT, Categories of IOT
- Applications of IOT- Smart Cities, Smart Transportation, Smart Home, Smart Healthcare, Smart Industry, Smart Agriculture, Smart Energy Management etc.

Syllabus to be covered before IA: Chapter 1,2,3,4

RECOMMENDED BOOKS

1. Entrepreneurship Development and Management by R.K Singhal, Katson Books., New Delhi
2. Entrepreneurship Development and Management by U Saroj and V Mahendiratta, Abhishek Publications, Chandigarh
3. Entrepreneurship Development and Management by Vasant Desai, Himalaya Pub.House
4. Industrial Engineering and Management by O.P Khanna ,Dhanpat Rai and Sons
5. Industrial Engineering and Management by Banga and Sharma, Khanna Publications
6. Internet of Things by Jeeva Jose, Khanna Publications, New Delhi
7. Online Resource on Startups and other concepts
8. https://www.fundable.com/learn/resources/guides/startup

Th-2 INTERNET AND WEB TECHNOLOGY

(Common to CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Internet Basics	6
2	Internet Connectivity & WWW	9
3	Internet Security	6
4	Internet Application	6
5	Website Classifications	3
6	Development of Portals Using HTML	9
7	Client side Scripting with JavaScript	6
8	Server Side Scripting	5
9	Server Side Programming using PHP	10
	TOTAL	**60**

B. RATIONALE : Now a days the usage of internet has become very essential in various areas like education, entertainment, business, sports etc. This subject will expose the learner to have an idea about the applications and services of Internet. Further the learner will able to plan and design a website to achieve the goal.

C. **Objective:** After completion of this course the student will be able to**:**

- Understand the concept of Internet and its wide application in various areas**.**
- Understand different internet connectivity and ISP.
- Understand the Internet security and Applications
- Know the methods of development of Portals using HTML
- Know the Client side Scripting using JavaScript
- Know the server side Scripting using PHP
- Know the what is ASP and what can it do

D. DETAIL CONTENTS:

1.0 Internet Basics

1.1 Computer network
1.2 Concept of Internet, Intranet, Modem
1.3. IP Address, Internet Domains, CIDR Notation, ISP, TCP/IP

2.0 Internet Connectivity & WWW

2.1 Introduction ot connectivity
2.2 Medium and methods of connectivity, ISDN, VSAT, RF Link
2.3 Working of Internet
2.4 Introduction to WWW, Application Level Protocol
2.5 Web Browser, URL, Hyper text, Hyperlinks, Hypermedia,
2.6 Search Engine, Proxy sever, CGI, URI, Dreamweaver

3.0 Internet Security

3.1 Introduction to security
3.2 Types of security, Authentication & Authorization

3.3 Firewalls, Encryption & Decryption, SSL

4.0 Internet Application
4.1 E-Mail, Email protocols
4.2 Telnet
4.3 FTP
4.4 Newsgroup
4.5 Chartroom
4.6 Internet Relay Chat
4.7 Video Conferencing
4.8 E-Commerce

5.0 Website Classifications
5.1 Static Websites
5.2 Dynamic websites
5.3 Web portals
5.4 Social Networking Sites
5.5 RSS Feed, Blog, Netiquette

6.0 Development of Portals Using HTML
6.1 Design a webpage, Good Web Design
6.2 HTML Introduction
6.3 HTML Tags, Anchor Tag, Table Tag
6.4 HTML Frames, Forms
6.5 Disadvantages of HTML
6.6 Separating style from structure with style sheets
6.7 CSS Rules, Types of CSS

7.0 Client side Scripting with JavaScript
7.1 Introduction to script, Client side Scripting, Types of Scripting
7.2 Variables in JavaScript, Built-in Function
7.3 Arrays in JavaScript, Conditional statements, Loops
7.4 Document Object Model
7.5 Creating Functions, objects in JavaScript
7.6 Event handling in JavaScript
7.7 Embedding JavaScript with HTML
7.8 Working with Cookies
7.9 Connecting database using JavaScript in HTML Page
7.10 Working with Browser, validating and submitting Forms

8.0 Server Side Scripting
8.1 Introduction to server side Scripting
8.2 Components of SSS
8.3 Difference between CSS and SSS
8.4 Server side Scripting method
8.5 JavaScript on server
8.6 SQL

9.0 Server Side Programming using PHP
9.1 Introduction to PHP
9.2 Variables, string, operator types
9.3 Conditional statement, Loops
9.4 Array
9.5 GET and POST Method and Sessions

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the Publisher
01	Neha Dutta, Adesh Pandey	Internet and Web Designing	Katson Books
02	Sisodia	Internet & Web page Design	BPB Publication
03	U.K Roy	Web Technologies	Oxford Univ.Press

Th-3 SOFTWARE ENGINEERING

(Common to CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTRODUCTION TO SOFTWARE ENGINEERING	06
2	SOFTWARE PROJECT MANAGEMENT	10
3	REQUIREMENT ANALYSIS AND SPECIFICATION	06
4	SOFTWARE DESIGN	10
5	USER INTERFACE DESIGN	08
6	SOFTWARE CODING & TESTING	12
7	SOFTWARE RELIABILITY	08
	TOTAL	**60**

B. RATIONALE: Software Engineering technology is now a days largely adopted by most computer based applications to bridge the gap between a human user & the computer. By this multiple media are implemented and used in computer based application to enhance their understanding ability before a common man. This will expose the students to various project building and testing techniques which they will encounter during there professional life as a software engineer or manager.

C. OBJECTIVE: After completion of this course the student will be able to**:**

- Understand the concept of Software Engineering**.**
- Understand how costs, schedule and quality drive a software project.
- Understand the role of software process and a process model in a project.
- Understand planning and estimation of a software project.
- Understand the role of SRS in a project and how requirements are validated
- Know the key design concepts of software engineering.
- Learn the structured code inspection process.
- Learn how testing is planned and testing done

D. CORSE CONTENTS:

1.0 Introduction to Software Engineering

1.1 Program vs. Software product
1.2Emergence of Software Engineering.
1.3 Computer Systems Engineering
1.4Software Life Cycle Models
- 1.4.1Classical Water fall model
- 1.4.2 Iterative Water fall model
- 1.4.3Prototyping model
- 1.4.4 Evolutionary model
- 1.4.5Spiral model

2.0 Software Project Management

2.1 Responsibility of Project Manager
2.2 Project Planning
2.3 Metrics for Project size estimation(LOC and FP)

2.4 Project Estimation Techniques
2.5 COCOMO Models, Basic, Intermediate and complete
2.6 Scheduling
2.7 Organization and Team structure
2.8 Staffing
2.9 Risk Management
2.10 Configuration Management

3.0 Requirement Analysis and specification

3.1 Requirements gathering and analysis
3.2 Software Requirements Specification
- 3.2.1 Contents of SRS
- 3.2.2 Characteristics of Good SRS
- 3.2.3 Organization of SRS
- 3.2.4 Techniques for representing complexing logic

4.0 Software Design

4.1 What is a Good S/W design
4.2Cohesion and coupling
4.3 Neat arrangement
4.4S/W Design approaches
4.5Structured analysis
4.6Data FlowDiagrams
4.7Symbols used in DFD
4.8Designing DFD
4.9Developing DFD model of a system
4.10Shortcomings of DFD
4.11 Structured design
4.12Principles of transformation of DFD to Structure Chart
4.13Transform analysis and Transaction Analysis
4.14 Design Review

5.0 User Interface Design

5.1 Characteristics of Good Interface
5.2 Basic concepts of UID
5.3Types of User interfaces
5.4 Components based GUI development

6.0 Software Coding & Testing

6.1 Coding
6.2.Code Review
. 6.2.1 Code walk through
. 6.2.2 Code inspections and software Documentation
6.3 Testing
6.4Unit testing
6.5 Black Box Testing
6.6 Equivalence class partitioning and boundary value analysis
6.7 White Box Testing
6.8Different White Box methodologies statement coverage branch coverage, condition coverage, path coverage,cyclomatic complexity data flow based testing and mutation testing
6.9Debugging approaches
6.10Debugging guidelines
6.11 Integration Testing

6.12Phased and incremental integration testing
6.13System testing alphas beta and acceptance testing
6.14Performance Testing, Error seeding
6.15General issues associated with testing

7.0 Software Reliability

7.1 Software Reliability
7.2 Different reliability metrics
7.3 Reliability growth modeling
7.4 Software quality
7.5 Software Quality Management System

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

BOOKS Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	Rajib Mall	Fundamentals of Software Engineering	PHI
02	Deepak Jain	Software Engineering: Principles and Practice	Oxford university press
03	Jawadekar	Software Engineering: A Primer	TMH

TH-4 COMPUTER HARDWARE& MAINTENANCE

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl No.	Topic	Periods
1	COMPUTER CENTRE MANAGEMENT	8
2	SITE PREPARATION & INSTALLATION	8
3	MOTHER BOARD and COMPONENTS	12
4	MEMORY AND I/O DEVICES	12
5	DISPLAY , POWER SUPPLY AND BIOS	5
6	MAINTENANCE AND TROUBLE SHOOTING	10
7	NETWORKING DEVICES AND THEIR INTERFACES	5
	TOTAL	60

B. **RATIONALE**

This subject shall give exposure to the students on different principles to be followed in Computer Centre management. It will also give idea about the different components of Computers both Desktop and Laptops. It shall also give idea about the method of assembly, dissembling of computers and different trouble shooting techniques.

C. OBJECTIVE

After undergoing the course, the students will be able to:

- Know about the manpower engaged in computer centre
- Know about the site preparation for computer centre furnishing
- Know about the details of Motherboard
- Know about the different components of computers
- Know about the working principles of different I/O devices
- Assemble the desktop computers
- Trouble shoot both Desktop and Laptop computers

D. DETAIL CONTENTS:

1. COMPUTER CENTRE MANAGEMENT

1.1 Need of Management in Computer Centre
1.2 Types of Jobs carried out in computers in an organization
1.3 Duties and responsibilities of personnel involved
1.4 Need of Training of Staff
1.5 Idea about Various makes of Computers.

2. SITE PREPARATION & INSTALLATION

2.1 Layouts of computer centre
2.2 False Roofing, Air Conditioning, Dust Proofing
2.3 Power Conditioning equipments like CVT, UPS, Isolation Circuits with Principles of functioning

3. MOTHER BOARD and COMPONENTS

3.1 Components and slots (Processor socket/slot, memory sockets, Chip sets, Cache, BIOS, Clock Generator, RTC, I/O Controller, power Connector, Key Board/Mouse Connectors, Jumpers, Pin Connectors etc)
3.2 Mother architecture and Block Diagram
3.3 Processors (Core2 Duo Processor, Quad Core Processor, Core i3,i5,i7 series, AMD A10 series, Xeon Processor)
3.4 Chip Sets
3.5 Bus Standards: PCI, AGP, USB etc.
3.6 Colour Codes for Devices/ports

4. MEMORY AND I/O DEVICES

4.1 Primary and secondary Memory
4.2 Memory speed , Access time
4.3 Hard Disk, Construction, Working Principles
4.4 File System, Formatting, Partitioning
4.5 Removable Storage and Special devices and their working principles(CD, DVD, External drives, Memory stick, USB flash drive, Solid state drive)
4.6 Key Board(Interfacing, USB, Wireless, Types of keys, Keyboard Matrix, Key Bouncing)
4.7 Mouse Interfacing
4.8 Printers(Types, operation and Trouble shooting)
4.9 Scanners(Types, operation and Trouble Shooting)

5. DISPLAY , POWER SUPPLY AND BIOS

5.1 Displays and Graphics Cards
5.2 LCD,PLASMA,TFT,LED Displays
5.3 SMPS (Basic Principles and operations, O/P voltage)
5.4 BIOS(Functions, setups, types of BIOS)
5.5 POST(Operation, Faults related to Hardware)

6. MAINTENANCE AND TROUBLE SHOOTING

6.1 Assembly of Components of Desktop Computers
6.2 Configuring Laptops and Power settings
6.3 Laptop Components(Adapter , Battery, Basic problems, RAM types, CPU types, Laptop Motherboard, block diagram, Laptop Keyboard)
6.4 Formatting , Partitioning and installation of OS
6.5 Trouble shooting of Common ly faced problems in Desktops and Laptops
6.6 Basic Maintenance concepts(Preventive, Corrective, online)
6.7 Diagnostic programs and tools
6.8 Methods of Trouble shooting(symptom observation, analysis, diagnosis, Correction)
6.9 Up gradation of system and application software
6.10 Virus concepts, Antivirus

7. NETWORKING DEVICES AND THEIR INTERFACES

7.1 Network Interface card
7.2 Networking interconnecting devices such as hub, switch, Router
7.3 Types of Network cable
7.4 Types of Network connector

Coverage of Syllabus up to Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the Publisher
01	Utpal Banarji,	Computer Management & Planning	TMH
02	B. Singh	PC Hardware	Firewall
03		PC Architecture Part I& II	Firewall
04	J Raventhal,	PC Repair and Maintenance,	Firewall
05	D.Balsubramanian	Computer Installation and servicing	TMH

Th-5 MOBILE COMPUTING
(Common to CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Introduction to Wireless networks & Mobile Computing	06
2	Introduction to Mobile Development Framework	06
3	Wireless Transmission	06
4	Medium Access Control	06
5	Wireless LANs	06
6	Ubiquitous Wireless Communication	06
7	Mobile IP	06
8	Mobile Computing	06
9	Wireless Telecomm Networks	06
10	Messaging Services	06
	TOTAL	**60**

B. RATIONALE: Now a days the communication technology has become very fast in development of various application areas. This subject will expose the learner to have an idea how the wireless network works along with the architecture of Mobile computing.

C. OBJECTIVE: After completion of thiscourse the student will be able to**:**

- To learn Mobile Computing Principles and Architecture
- To understand Mobility Management, GSM, and GPRS networks
- To know Short Message Service (SMS) technology, GPRS, WAP, CDMA, 3G
- Understand Wireless LAN, WiFi, and WLL (Wireless Local Loop) Architecture
- Understand the concept of Mobile IP.
- Learn Bluetooth, RFID, and Satellite Communications.
- To Know Next Generation Networks (NGN)

D. COURSE CONTENT

1. Introduction to Wireless networks & Mobile Computing 06
1.1Networks
1.2 Wireless Networks
1.3 Mobile Computing
1.4 Mobile Computing Characteristics
1.5 Application of Mobile Computing

2. Introduction to Mobile Development Framework
2.1 C/S architecture
2.2 n-tier architecture
2.3 n-tier architecture and www
2.4 Peer-to Peer architecture
2.5 Mobile agent architecture

3. Wireless Transmission
3.1 Introduction
3.2 Signals
3.3 Period, Frequency and Bandwidth.
3.4 Antennas
3.5 Signal Propagation
3.6 Multiplexing
3.7 Modulation
3.8 Spread Spectrum
3.9 Cellular System

4. Medium Access Control
4.1 Introduction
4.2 Hidden/ Exposed Terminals
4.3 The basic Access Method
4.4 Near / Far Terminals
4.5 SDMA, FDMA,TDMA, CDMA

5. Wireless LANs
5.1 Wireless LAN and communication
5.2 Infrared
5.3 Radio Frequency
5.4 IR Advantages and Disadvantages
5.5 RF Advantages and Disadvantages
5.6 Wireless Network Architecture Logical
5.7 Types of WLAN
5.8 IEEE 802.11
5.9 MAC layer
5.10 Security
5.11 Synchronization
5.12 Power Management
5.13 Roaming
5.14 Bluetooth Overview

6. Ubiquitous Wireless Communication
6.1 Introduction
6.2 Scenario of Mobile Communication
6.3 Mobile Communication Generations 1G to 3G
6.4 3rd Generation Mobile Communication Network
6.5 Universal Mobile telecommunication System (UMTS)

7. Mobile IP
7.1 Overview
7.2 Working with mobile IP
7.3 Mobile IP Entities
7.4 Mobility Agents
7.5 Components of Mobile IP
7.6 Mobile IPv6 Features
7.7 Mobile IPv6 Address Types
7.8 Mobile IPv6 Address Scope
7.9 Mobile IP Operation

8. Mobile Computing
8.1 WWW architecture for Mobile computing
8.2 Need of WAP
8.3 Benefits of WAP
8.4 Examples of WAP

8.5 WAP- Architecture
8.6 WAP protocols
8.7 WML
8.8 WAP Push architecture
8.9 Push-Pull based data acquisition
8.10 I-mode
8.11 WAP 2.x

9. Wireless Telecomm Networks
9.1 GSM
9.2 GPRS
9.3 IS-95
9.4 CDMA-2000
9.5 W-CDMA
9.6 Wireless Sensor Networks

10. Messaging Services
10.1 Short Message Services (SMS)
10.2 Multimedia Message Services (MMS)
10.3 Multimedia transmission over wireless

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

Books Recommanded:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	Dr. N.NJani, Kamaljit I. Lakhtaria, Dr. Ashish N. Jani & Nita Kanabar	Mobile Computing	S.Chand& Company Ltd

PR-1 WEB DEVELOPMENT LAB

Practical	**4 Periods per week**	**Term Work**	**25 Marks**
Total Periods	**60 Periods**	**Term End Exam**	**50 Marks**
Examination	**3 Hours**	**TOTAL MARKS**	**75 Marks**

RATIONALE:

This course will enable the students to understand and develop competency amongst the students to design professional database backed dynamic and feature based web sites. The course covers the use of programming with PHP and the concepts of database with My SQL.

OBJECTIVES

After going through the subject, the student will be able to

- Compare and contrast the use of various mark-up languages.
- Perform various logical operations in PHP
- Create simple programmes to validate forms in PHP
- Perform database connectivity using PHP

DETAILED CONTENTS

1. DEVELOPING PORTALS USING HTML

   Introduction to HTML 5 and CSS 3. Basic structure of HTML, designing a web page, inserting liks images, horizontal rules, comments. Formatting text, title, headings, colors, fonts, sizes, simple tables and forms. HTML tags, hyperlinks. Adding graphics and images, image maps, image files.Using tables, forms, style sheets and frames.Floating of web site/pages.

2. PHP

   Introduction to PHP: How PHP Works , The php.ini File, Basic PHP Syntax, PHP variables, statements, operators, decision making, loops, arrays, strings, forms, get and post methods, functions.
   Introduction to cookies, storage of cookies at client side, Using information of cookies. Creating single or multiple server side sessions.Timeout in sessions, Event management in PHP. Introduction to content management systems based on PHP.

3. PHP and MySQL

   Introduction to MySQL, connecting to MySQL, database, creation, insertion, deletion and retrieval of MySQL data using PHP.

LIST OF PRACTICALS

1. Design PHP based web pages using correct PHP, CSS, and XHTML syntax, structure.
2. Create Web forms and pages that properly use HTTP GET and POST protocol as appropriate.
3 Design SQL language within MySQL and PHP to access and manipulate databases.
4. Install and configure both PHP and MySQL.
5 Create PHP code that utilizes the commonly used API library functions built in to PHP.
6. Design and create a complete web site that demonstrates good PHP/MySQL client/server design.

7. To store a cookie using PHP on client side.
8. To save the user session on server side.
9. Design website

RECOMMENDED BOOKS:

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1	Julie C. Meloni,	Sams Teach Yourself PHP, MySQL, and Apache All in One	SAMS ,ISBN 0-672-32976-X
2	Ivan Byross ,	Web enabled development application	TMH

Pr.2 - COMPUTER HARDWARE MAINTENANCE LAB

Practical	**4 Periods per week**	**Term Work**	**25 Marks**
Total Periods	**60 Periods**	**Term End Exam**	**50 Marks**
Examination	**3 Hours**	**TOTAL MARKS**	**75 Marks**

LIST OF PRACTICALS:-

1. Study of layout of Mother Board and different components
2. Study of Expansion slots, Bus structure and ports with color codes
3. Study of functioning of SMPS with O/P voltage and connectors
4. Study of HDD Interfaces,
5. Connecting Hardware Components for assembly of computer
6. Setting up of CMOS
7. Installing OS
8. Installing different software
9. Study different BIOS setup and different faults
10. Perform trouble shooting in Desktop and Laptop

PR-3 PYTHON PROGRAMMING LAB

Total Periods	**60**	**Maximum Marks**	**75 Marks**
Lab. Periods:	**4 Periods /week**	**Term Works**	**25 Marks**
Examination	**3hours**	**End Semester Examination**	**50Marks**

RATIONALE

This course introduces to the students the Python language. Upon completion of this course, the student will be able to write non trivial Python programs dealing with a wide variety of subject matter domains. Topics include language components, the IDLE/IDE environment, control flow constructs, strings, I/O, collections, classes, modules, and regular expressions

LEARNING OUTCOMES

After undergoing the course, the students will be able to:

- Execute Python code in a variety of environments
- Use correct Python syntax in Python programs
- Use the correct Python control flow construct
- Write Python programs using various collection data types
- Write home grown Python functions
- Use many of the standard Python modules such as os, sys, math, and time
- Trap various errors via the Python Exception Handling model
- Use the IO model in Python to read and write disk files
- Create their own classes and use existing Python classes. Understand and use the Object Oriented paradigm in Python programs
- Use the Python Regular Expression capabilities for data verification

DETAILED CONTENTS

1. Introduction
   - Brief History of Python
   - Python Versions
   - Installing Python
   - Environment Variables
   - Executing Python from the Command Line
   - IDLE
   - Editing Python Files
   - Python Documentation
   - Getting Help
   - Dynamic Types
   - Python Reserved Words
   - Naming Conventions

2. Basic Python Syntax
   - Basic Syntax
   - Comments
   - String Values
   - String Methods
   - The format Method

- String Operators
- Numeric Data Types
- Conversion Functions
- Simple Output
- Simple Input
- The % Method
- The print Function

3. Language Components
   - Indenting Requirements
   - The if Statement
   - Relational and Logical Operators
   - Bit Wise Operators
   - The while Loop
   - break and continue
   - The for Loop

4. Collections
   - Introduction
   - Lists
   - Tuples
   - Sets
   - Dictionaries
   - Sorting Dictionaries
   - Copying Collections
   - Summary

5. Functions
   - Introduction
   - Defining Your Own Functions
   - Parameters
   - Function Documentation
   - Keyword and Optional Parameters
   - Passing Collections to a Function
   - Variable Number of Arguments
   - Scope
   - Functions - "First Class Citizens"
   - Passing Functions to a Function
   - map
   - filter
   - Mapping Functions in a Dictionary
   - Lambda
   - Inner Functions
   - Closures

6. Modules
   - Modules
   - Standard Modules - sys
   - Standard Modules - math
   - Standard Modules - time
   - The dir Function

7. Exceptions
    - Errors
    - Runtime Errors
    - The Exception Model
    - Exception Hierarchy
    - Handling Multiple Exceptions
    - Raise
    - assert

8. Input and Output
    - Introduction
    - Data Streams
    - Creating Your Own Data Streams
    - Access Modes
    - Writing Data to a File
    - Reading Data From a File
    - Additional File Methods
    - Using Pipes as Data Streams
    - Handling IO Exceptions

9. Classes in Python
    - Classes in Python
    - Principles of Object Orientation
    - Creating Classes
    - Instance Methods
    - File Organization
    - Special Methods
    - Class Variables
    - Inheritance
    - Polymorphism

10. Regular Expressions
    - Introduction
    - Simple Character Matches
    - Special Characters
    - Character Classes
    - Quantifiers
    - The Dot Character
    - Greedy Matches
    - Grouping
    - Matching at Beginning or End
    - Match Objects
    - Substituting
    - Splitting a String
    - Compiling Regular Expressions
    - Flags

LIST OF PRACTICALS

1. Write instructions to perform each of the steps below
    (a) Create a string containing at least five words and store it in a variable.
    (b) Print out the string.
    (c) Convert the string to a list of words using the string split method.

(d) Sort the list into reverse alphabetical order using some of the list methods (you might need to use dir(list) or help(list) to find appropriate methods).

(e) Print out the sorted, reversed list of words.

2. Write a program that determines whether the number is prime.
3. Find all numbers which are multiple of 17, but not the multiple of 5, between 2000 and 2500?
4. Swap two integer numbers using a temporary variable. Repeat the exercise using the code format: a, b = b, a. Verify your results in both the cases.
5. Find the largest of n numbers, using a user defined function largest().
6. Write a function my Reverse() which receives a string as an input and returns the reverse of the string.
7. Check if a given string is palindrome or not.
8. WAP to convert Celsius to Fahrenheit
9. Find the ASCII value of charades
10. WAP for simple calculator

Methodology

The Students shall be taught about the Syntax of Python Language which is similar to other High level languages in the initial 8 to 10 classes. Then after learning the syntax the students shall Write the codes for the Practical Exercise and Test its results in the Lab.

RECOMMENDED BOOKS

Sl.No	**Name of Authors**	**Title of the Book**	**Name of the publisher**
1	C Satyanarayan M, Radhika Mani, B N Jagdesh	Python Programming	University Press
2	Mark Lutz;	Learning Python by Mark Lutz;	Pratham Books, Bangalore
3	Robert Richards	Python Programming For Beginners: A Must Read Introduction to Python Programming	Pratham Books, Bangalore

Pr 4. PROJECT WORK (Phase-I)

Name of the Course: Diploma in CSE			
Course code:		Semester	5th
Total Period:	60	Examination :	-
Theory periods:	4P / week	Sessional Marks	25
Examination	-	TOTAL Marks	25

RATIONALE

Students' Project Work aims at developing innovative skills in the students whereby they apply the knowledge and skills gained through the course covered in many subjects and Labs, by undertaking a project. The prime emphasis of the project work is to understand and apply the basic knowledge of the principles of software engineering/ Hardware design and practices in real life situations, so as to participate and manage a large software engineering projects and /or appropriate Hardware with embedded software, in future.
Entire Project shall spread over 5th and 6th Semester. Part of the Project covered in 5th Semester shall be named as *Project Phase-I* and balance portion to be covered in 6th Semester shall be named as *Project Phase-II*.

OBJECTIVES

After undergoing the Project Work, the student will be able to:

- Implement the theoretical and practical knowledge and skills gained through various subjects/courses into an application suitable for a real practical working environment, preferably in an industrial environment.
- Develop software packages or applications and implement these for the actual needs of the community/industry.
- Identify and contrast gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge as required.
- Carry out cooperative learning through synchronous guided discussions within the class in key areas, asynchronous document sharing and discussions, as well as prepare collaborative edition of the final project report.
- To achieve real life experience in software/hardware design.
- To develop the skill of writing Project Report

General Guidelines

The individual students have different aptitudes and strengths and also areas of interest. Project work, therefore, should match the strengths and interest of the students. For this purpose, students should be asked to identify the type of project work, they would like to execute. The activity of problem identification should begin well in advance (right from beginning of 5th semester). Students should be allotted a problem of interest to him/her as a project work. It is also essential that the faculty of the respective department may have a brainstorming session to identify suitable project assignments for their students. The project assignment can be individual assignment or a group assignment. Preferably there should not be more than 5 students, if the project work is given to a group. The project work identified in collaboration with industry should be preferred.

Following are the broad suggestive areas of project work

- ✓ Database Management Systems.
- ✓ Software Engineering and Software Development.
- ✓ Web page Designing.
- ✓ Computer Graphics and Animation.
- ✓ Multimedia Systems.
- ✓ Computer Networks.
- ✓ Internet and e-commerce.
- ✓ Computer Security and Cryptography.
- ✓ Computer hardware and embedded systems.
- ✓ Improving existing systems / equipment.
- ✓ Any other related area found worth.

A suggestive criterion for assessing student performance by the external (preferably person from industry) and internal (teacher) examiner is given in table below:

Sl. No.	**Performance Criteria**
1.	Selection of project assignment
2.	Planning and execution of considerations
3.	Quality of performance
4.	Providing solution of the problems or production of final product
5.	Sense of responsibility
6.	Self expression/ communication/ Presentation skills
7.	Interpersonal skills/human relations
8.	Report writing skills
9	Viva voce

The teachers are free to evolve other criteria of assessment, depending upon the type of project work.

It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organisations to such an exhibition.

Project Phase-I and Phase-II

The Project work duration shall cover 2 semesters(5^{th} and 6^{th} sem). The Grouping of students, selection of Project, assignment of Project Guide to the Group shall be done in the beginning of 5^{th} sem under Project Phase-I. The students may be allowed to study literature, any existing system and then define the Problem/objective of the Project. Requirements specification, DFD and Design of the system have to be complete in Phase-I. Coding may also begin in this phase. Project Milestones are to be set so that progress can be tracked . In Phase-II Coding, Testing, Documentation have to be complete. Teacher Guides can make suitable alteration in the components of Task and schedule. *Project Report have to be prepared and complete in Phase-II.* All Project reports should be organized uniformly in proper order, irrespective of group.

At the end of Project Phase-I in 5^{th} semester there shall be one presentation by each group to mark to progress and also to judge whether the Project is moving in right direction as per the objective of the Project.

Equipment List

(For a Batch of 30 students)

1. Desktop PC with UPS – 30 numbers
2. Software such as
   HTML, PHP, My SQL, Python, Windows, Linux
3. Computers in Running conditions (Old/New) at least 10 Nos. to be used for students practice of de-assembly and assembly of computer and Installation of OS etc.

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA									
TEACHING AND EVALUATION SCHEME FOR 6th Semester (CSE)(wef 2020-21)									
Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	End Sem Exams	Exams (Hours)	Total
		Theory							
Th.1		Cryptography & Network Security	4		-	20	80	3	100
Th.2		Internet of Things	4		-	20	80	3	100
Th.3		Cloud Computing	4		-	20	80	3	100
Th.4		Elective a. Artificial Intelligence & Machine Learning, b. Data Science & Analytics c. E-Commerce	4			20	80	3	100
		Total	*16*			*80*	*320*	-	*400*
		Practical							
Pr.1		Network Security Lab	-	-	4	25	50		75
Pr.2		Internet of Things Lab	-	-	4	50	50		100
Pr.3		Project Phase - II			10	50	100		150
Pr.4		Life Skill			2	25	-		25
		Student Centered Activities(SCA)		-	3	-	-	-	-
		Total	-	-	*23*	*150*	*200*	-	*350*
		Grand Total	**16**		**23**	**230**	**520**	**-**	**750**
Abbreviations: L-Lecturer, T-Tutorial, P-Practical . Each class is of minimum 55 minutes duration									
Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%									
SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAM/Idea Tinkering and Innovation Lab Practice etc. ,Seminar and SCA shall be conducted in a section.									
There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester									

Th-1 CRYPTOGRAPHY & NETWORK SECURITY

COMMON TO (CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	POSSIBLE ATTACKS ON COMPUTERS	05
2	CRYPTOGRAPHY CONCEPTS	10
3	SYMMETRIC & ASYMMETRIC KEY ALGORITHMS	15
4	DIGITAL CERTIFICATE & PUBLIC KEY INFRASTRUCTURE	10
5	INTERNET SECURITY PROTOCOLS	10
6	USER AUTHENTICATION	04
7	NETWORK SECURITY & VPN	06
	TOTAL	**60**

B. RATIONALE

Now a day almost all It related jobs use the internet as the backbone service. Therefore it is highly essential for an IT professional to have a fare idea on the security aspect of internet service. This paper aims to provide the student with the various security threats in internet and discuss the different techniques to implement this. One of such technique is implementation of cryptography in the confidential data to be floated in the internet.

C. OBJECTIVE: After completion of this course the student will be able to**:**

- Understand the basic concepts that of security approach.
- Learn about different attack on the computer systems.
- Learn about the measures to save computer hardware and software.
- Understand different certification to ensure security.
- Learn about basic concepts of firewalls and their use.
- Understand privacy and security.

D. DETAIL CONTENTS:

1. Possible attacks on Computers

1.1 The need for security
1.2 Security approach
1.3 Principles of security
1.4 Types of attacks

2. Cryptography Concepts

2.1 Plain text & Cipher Text
2.2 Substitution techniques
2.3 Transposition techniques

2.4 Encryption & Decryption
2.5 Symmetric & Asymmetric key cryptography

3. Symmetric & Asymmetric key algorithms

3.1 Symmetric key algorithm types
3.2 Overview of Symmetric key cryptography
3.3 Data encryption standards
3.4 Over view of Asymmetric key cryptography
3.5 The RSA algorithm
3.6 Symmetric & Asymmetric key cryptography
3.7 Digital signature

4. Digital certificate & Public key infrastructure

4.1 Digital certificates
4.2 Private key management
4.3 PKIX Model
4.4 Public key cryptography standards

5. Internet security protocols

5.1 Basic concept
5.2 Secure socket layer
5.3 Transport layer security
5.4 Secure Hyper text transfer protocol(SHTTP)
5.5 Time stamping protocol (TSP)
5.6 Secure electronic transaction (SET)

6. User authentication

6.1 Authentication basics
6.2 Password
6.3 Authentication Tokens
6.4 Certificate based authentication
6.5 Biometric authentication

7. Network Security & VPN

7.1 Brief introduction of TCP/IP
7.2 Firewall
7.3 IP Security
7.4 Virtual Private Network (VPN)

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

BOOKS Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	A. Kahate	Cryptography & Network security	TMH
02	W.Stallings	Cryptography & Network Security Principals and Practices	Prentice Hall
03	Pachghare	Cryptography & Information security	PHI

TH-2 INTERNET OF THINGS

(Common to CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	Introduction to Internet of Things	6
2	IoT Networking	6
3	Connectivity Technologies	6
4	Wireless Sensor Networks	6
5	M2M Communication	6
6	Programming with Arduino	5
7	Programming with Raspberry Pi	5
8	Software defined Networking	6
9	Smart Homes	5
10	Smart Cities	5
11	Industrial IoT	4
	TOTAL	**60**

B. RATIONALE

IoT is a new Technology which shall make revolutionary changes in all fields of Life including Industries. Smart cities are the best place where applications of IoT can be predominantly seen. IoT involves extensive use of sensors, network, actuators, micro controllers ,software. Using such components in network shall bring versatile usage of IoT through Cloud service.

C. OBJECTIVE: After completion of this course the student will be able to**:**

- Know what IoT is
- Know Physical and Logical design of IoT
- Understand the other Technology associated with IoT
- Know the areas of applications of IoT
- Understand the concept of IIoT
- Know the working with Arduino and Raspberry Pi

D. DETAIL CONTENTS:

1. Introduction to Internet of Things

1.1 Introduction
1.2 Characteristics of IoT
1.3 Applications of IoT
1.4 IoT Categories

1.5 IoT Enablers and connectivity layers
1.6 Baseline Technologies
1.1 Sensor
1.2 Actuator
1.3 IoT components and implementation
1.4 Challenges for IoT

2. **IOT Networking**
   2.1 Terminologies
   2.2 Gateway Prefix allotment
   2.3 Impact of mobility on Addressing
   2.4 Multihoming
   2.5 Deviation from regular Web
   2.6 IoT identification and Data protocols
3. **Connectivity Technologies**
   3.1 Introduction
   3.2 IEEE 802.15.4
   3.3 ZigBee, 6LoWPAN
   3.4 RFID, HART and wireless HART
   3.5 NFC, Bluetooth, Z wave, ISA100.11.A
4. **Wireless Sensor Networks**
   4.1 Introduction
   4.2 Components of a sensor node
   4.3 Modes of Detection
   4.4 Challenges in WSN
   4.5 Sensor Web
   4.6 Cooperation and Behaviour of Nodes in WSN
   4.7 Self Management of WSN
   4.8 Social sensing WSN
   4.9 Application of WSN
   4.10 Wireless Multimedia sensor network
   4.11 Wireless Nanosensor Networks
   4.12 Underwater acoustic sensor networks
   4.13 WSN Coverage
   4.14 Stationary WSN, Mobile WSN
5. **M2M Communication**
   5.1 M2M communication
   5.2 M2M Ecosystem
   5.3 M2M service Platform
   5.4 Interoperability
6. **Programming with Arduino**
   6.1 Features of Arduino
   6.2 Components of Arduino Board
   6.3 Arduino IDE
   6.4 Case Studies
7. **Programming with Raspberry Pi**
   7.1 Architecture and Pin Configuration
   7.2 Case studies
   7.3 Implementation of IoT with Raspberry Pi
8. **Software defined Networking**
   8.1 Limitation of current network
   8.2 Origin of SDN
   8.3 SDN Architecture
   8.4 Rule Placement, Open flow Protocol
   8.5 Controller placement
   8.6 Security in SDN
   8.7 Integrating SDN in IoT
9. **Smart Homes**
   9.1 Origin and example of Smart Home Technologies
   9.2 Smart Home Implementation
   9.3 Home Area Networks(HAN)
   9.4 Smart Home benefits and issues
10. **Smart Cities**
    10.1 Characteristics of Smart Cities

10.2 Smart city Frameworks
10.3 Challenges in Smart cities
10.4 Data Fusion
10.5 Smart Parking
10.6 Energy Management in Smart cities

11. Industrial IoT

11.1 IIoT requirements
11.2 Design considerations
11.3 Applications of IIoT
11.4 Benefits of IIoT
11.5 Challenges of IIoT

Coverage of Syllabus upto Internal Exams (I.A.)

Chapter 1,2,3,4

Books Recommended :-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	Jeeva Jose	Internet of Things	Khanna Books
02	Arsheep Bhaga, Vijay Madisetti	Internet of Things A Hands-on approach	University press

Th-3 CLOUD COMPUTING

(Common to CSE/IT)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTRODUCTION TO CLOUD COMPUTING	05
2	CLOUD COMPUTING ARCHITECTURE	08
3	SCALABILITY AND FAULT TOLERANCE	08
4	CLOUD MANAGEMENT AND VIRTUALISATION TECHNOLOGY	08
5	VIRTUALISATION	08
6	CLOUD SECURITY	08
7	CLOUD COMPUTING SECURITY ARCHITECTURE	05
8	MARKET BASED MANAGEMT OF CLOUDS	05
9	HADOOP	05
	TOTAL	**60**

B.RATIONALE:

Cloud computing is one of the emerging topics in Information Technology. It is the biggest buzz in the computer world. Cloud computing means you can deliver applications to your end user faster than ever, without investing in new infrastructure, training new personnel or licensing new software. It is a practical approach to experience direct cost benefits and easy to use for the users.

C. Objective : After completion of this course the student will be able to**:**

- Understand the basic concepts of cloud and cloud architecture.
- Learn about different cloud computing technology.
- Learn about the service levels for cloud applications.
- Provides a practical exposure to professionals intending to work in cloud computing environment.
- Understand the map reduce model and its application.
- Learn about basic concepts of software productivity in a cloud.
- Understand web services and platforms.

D. DETAIL CONTAINS:

1. Introduction To Cloud Computing

1.1. Historical development
1.2. Vision of Cloud Computing
1.3. Characteristics of Cloud computing
1.4. Cloud computing Reference model
1.5. Cloud computing environment
1.6. Cloud Service requirements
1.7. Cloud and Dynamic Infrastructure
1.8. Cloud Adoption
1.9. Cloud applications

2. Cloud Computing Architecture

2.1. Introduction
2.2. Cloud Reference Model
2.3. Types of Clouds
2.4. Cloud Interoperability and standards
2.5. Cloud computing Interoperability use cases
2.6. Role of standards in Cloud Computing environment

3. Scalability and Fault Tolerance

3.1. Introduction
3.2. Scalability and Fault Tolerance
3.3. Cloud solutions
3.4. Cloud Ecosystem
3.5. Cloud Business process management
3.6. Portability and Interoperability
3.7. Cloud Service management
3.8. Cloud Offerings
3.9. Testing under Control
3.10. Cloud service Controls
3.11. Virtual desktop Infrastructure

4. Cloud Management and Virtualisation Technology

4.1. Create a virtualised Architecture
4.2. Data Centre
4.3. Resilience
4.4. Agility
4.5. Cisco Data Centre Network architecture
4.6. Storage
4.7. Provisioning
4.8. Asset Management
4.9. Concept of Map Reduce
4.10. Cloud Goverance
4.11. Load Balancing
4.12. High Availability
4.13. Disaster Recovery

5. Virtualisation

5.1. Virtualisation
5.2. Betwork Virtualisation
5.3. Desktop and Application Virtualisation
5.4. Desktop as a service
5.5. Local desktop Virtualisation
5.6. Virtualisation benefits
5.7. Server Virtualisation

5.8. Block and File level Storage Virtualisation
5.9. Virtual Machine Monitor
5.10. Infrastructure Requirements
5.11. VLAN and VSAN

6. Cloud Security

6.1. Cloud Security Fundamentals
6.2. Cloud security services
6.3. Design Principles
6.4. Secure Cloud software requirements
6.5. Policy Implementation
6.6. Cloud Computing Security Challenges

7. Cloud Computing Security Architecture

7.1. Architectural Considerations
7.2. Information Classification
7.3. Virtual Private Networks
7.4. Public Key and Encryption Key management
7.5. Digital certificates
7.6. Key management
7.7. Memory Cards
7.8. Implementing Identity Management
7.9. Controls and Autonomic System

8. Market Based Management of Clouds

8.1. Cloud Information security vendors
8.2. Cloud Federation, charactrization
8.3. Cloud Federation stack
8.4. Third Party Cloud service
8.5. Case study

9. Hadoop

9.1. Introduction
9.2. Data Source
9.3. Data storage and Analysis
9.4. Comparison with other system

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3,4

BOOKS Recommended:-

Sl .No.	Name of the Author	Title of the Book	Name of the Publisher
1	Pankaj Sharma	Cloud Computing	Katson Books
1	Dr. U.S. Pandey , Dr. KavitaChoudhary	Cloud Computing	S. Chand
2	PrasantkumarPattnaik, ManasRanjanKabat , Souvik Pal	Fundamentals of Cloud Computing	Vikas

Th-4 (a) ARTIFICIAL INTELIGENCE & MACHINE LEARNING (Elective)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	ITRODUCTION TO AI	**08**
2	SEARCH ALGORITHMS	**10**
3	KNOWLEDGE REPRESENTATION AND REASONING	**08**
4	MACHINE LEARNING	**10**
5	PATTERN RECOGNITION	**08**
6	CLASSIFICATION	**08**
7	EXPERT SYSTEM	**08**
	TOTAL	**60**

B. **RATIONALE**

AI has significantly progressed and today forms an important part of industry and technology. Brain-Like AI aims at analyzing and deciphering the working mechanisms of the brain and translating this knowledge into implementable AI architectures with the objective to develop in this way more efficient, flexible, and capable technical systems. AI has many applications from Game playing to Natural Language processing, expert systems etc.

C. OBJECTIVE :

After completion of this course the student shall be able to

- Know what is AI and what are its application
- What are the searching Algorithms
- Knowledge representation forms
- Pattern recognition principles and applications
- Machine Learning methods
- Expert System approaches

D. COURSE CONTENTS:

1. **Introduction to AI**
   1.1 Definition of AI, History of AI
   1.2 Goals and Applications of AI
   1.3 Intelligent agent
   1.4 Computer vision
   1.5 Natural Language Processing
   1.6 Turing test
   1.7 Problem solving in Games

2. Introduction to Search Algorithm

2.1 Search, Search space, Search Tree
2.2 Categories and Types of Search
2.3 Heuristic Algorithm vrs Solution Guaranteed Algorithm
2.4 Local search and Optimal problem(Hill climbing, BFS,A*,AO*)
2.5 Adversarial Search
2.6 AI and Game Playing

3. Knowledge Representation and Reasoning

3.1What to represent, Knowledge
3.2 Properties of Knowledge Representation System, Approaches
3.3 Knowledge Representation
3.4 Reasoning and Types of reasoning

4. Machine Learning

4.1 Machine Learning
4.2 Statistical or Unsupervised Learning
4.3 ML Properties
4.4 Reinforcement Learning
4.5 Decision Tree

5. Pattern Recognition

5.1 Introduction to Pattern recognition
5.2 Design Principles of Pattern recognition system
5.3 Statistical Pattern recognition System
5.4 Machine Perception
5.5 Line Finding and Interception
5.6 Object Identification

6. Expert System

6.1 Introduction to Expert system
6.2 Basic Architecture
6.3 Type of Problem Solved by Expert system
6.4 Features of an Expert System
6.5 Expert System Architectures
6.6 Expert System Tools
6.7 Existing Expert Systems
6.8 Applications of Expert System Technology

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3

BOOKS Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1	Pankaj Sharma	Artificial intelligence	Katson Books
2	Munesh Chandra Trivedi	A Classical approach to Artificial intelligence	Khanna Books

Th-4 (b) DATA SCIENCE AND ANALYTICS (Elective)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

A. Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTRODUCTION TO DATA SCIENCE	10
2	DATA MANAGEMENT USING 1BM SPSS	10
3	DATA ANALYSIS USING R PROGRAMMING LANGUAGE	10
4	DATA VISUALISATION	08
5	APPLICATION OF DATA SCIENCE,TECHNOLOGY FOR VISUALISATION AND BOKEH	12
6	RECEND TRENDS IN DATA SCIENCE	10
	TOTAL	**60**

B. RATIONALE:

Voluminous data are being created in the world every year. Ability to take data, to be able to understand it , to process it, to extra value from it, to visualize it etc are important at the professional level. Data Science and Data Analytics is the are the upcoming concepts in IT field to look after the voluminous data analysed and presented in meaningful manner.

C.OBJECTIVE: After completion of this course the student will be able to**:**

- Understand the basic concepts of Data Science.
- Learn about data management acivities
- Learn basics of Data Analysis.
- Learn about data visualisation
- Learn Applications of Data Science, Technologies for visualisation.
- Learn about Recent Trends in Data Science.

D. COURSE CONTENT

1. Introduction to Data Science

1.1 Data Science
1.2 Related Terminology
1.3 Methods of Data Repository
1.4 Personnel involved in Data Science
1.5 Types of Data
1.6 Data Science Process
1.7 Popular Data Science Toolkits

1.8 Existing Applications

2. Data Mangement Using 1BM SPSS

2.1 Data Management Planning
2.2 Data management Plan
2.3 Data Collection and Management
2.4 Application Programming Interface
2.5 Exploring Data and Building Models
2.6 Storage Management, Importing Data

3. Data Analysis using R Programming Language

3.1 Applied Statistical Techniques
3.2 Types of Statistical Data
3.3 Types of Big Data Analytics
3.4 Collecting Data for Sampling and Distribution
3.5 Probability, Frequency Distribution
3.6 Population and Parameters
3.7 Central tendency and Central Value
3.8 Measures of Central Tendency
3.9 Different types of Statistical Means
3.10 Estimation Problem
3.11 Normal Distribution Curve

4. Data Visualisation

4.1 Data Visualisation and its importance
4.2 Data Visualization methods
4.3 Variables and Encoding

5. Applications of Data Science, Technologies for Visualisation

5.1 Applications of Data Science Technologies for visualisation
5.2 Python Programming
5.3 Data Types, Operations
5.4 Modules, Library
5.5 Introduction to Bokeh

6. Recent Trends in Data Science

6.1 Data collection and Analysis Techniques
6.2 Big Data Visualisation Tools and Visualising
6.3 Preattentive Attributes
6.4 Challenges of Big Data Visualisation
6.5 Potential Solution
6.6 Future Progress of Big Data Visualisation

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3

BOOKS Recommended:-

Sl. No	Name of the Author	Title of the Book	Name of the Publisher
1	V.K Jain	Data Science and Analytics	Khanna Publishing House

Th-4 (c) E-Commerce (Elective)

Theory	**4 Periods per week**	**Internal Assessment**	**20 Marks**
Total Periods	**60 Periods**	**End Sem Exam**	**80 Marks**
Examination	**3hours**	**Total Marks**	**100Marks**

Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTORODUCTION TO E-COMMERCE	08
2	BUSINESS MODELS OF E-COMMERCE	05
3	B2B E-COMMERCE AND EDI	10
4	BUSINESS APPLICATIONS OF E-COMMERCE	07
5	E-COMMERCE IN TECHNOLOGY	08
6	ELECTRONIC PAYMENT SYSTEM	08
7	SECURITY ISSUES IN E-COMMERCE	08
8	CURRENT TRENDS IN ELECTRONIC WORLD	06
	TOTAL	**60**

RATIONALE :

The internet revolution is sweeping the globe with such swiftness that firms and companies around the world are trying to understand, what is occurring, what it all means, where it is going and how to leverage this new opportunity. The purpose of this study are to address several of the underline rational to analysis digital divide, to purpose possible some specific proposition best on the extensive literature search provided here. It is identified that the e-commerce platform is one of the top most technology in investment priorities'-commerce platform are the backbone of any digital channel and replacing legacy home grown systems.

OBJECTIVES:

- Understand the concept of market and availability of products.
- Understand how to make trading in online mode.
- Have a concept of selection of commodities and goods.
- Know the process of searching for your requirements electronically.
- Find a way to compare the quality and cost of each and every item as per your requirement.
- Know the way to make purchase in online mode by electronic payment system.
- Understand how to make the payments secured and private.
- Know the concepts and requirement of different Firewalls.

COURSE CONTENT

1. Intoroduction to E-Commerce

1.1 Introduction
1.2 what is E-commerce
1.3 E-Business

1.4 Categories of E-Commerce Applications
1.5 Global Trading Environment & Adoption of E-commerce
1.6 Comparison between traditional and E-commerce
1.7 Advantage and Disadvantage

2. Business Models of E-Commerce

2.1 Introduction
2.2 Business Models of E-Commerce
2.3 B2C
2.4 B2B
2.5 Difference between B2C and B2B
2.6 C2C

3. B2B e-Commerce and EDI

Introduction
3.1 Need for B2B
3.2 EDI
3.3 Paperless Transaction
3.4 EDI standards
3.5 Data Standards used in EDI
3.6 Cost of EDI
3.7 Reasons for Slow acceptability
3.8 Electronic Fund Transfer (Canada case eliminated)
3.9 XML and its application
3.10 Comparison of HTML and XML
3.11 Advantage of XML as a Technology

4. Business Applications of E-Commerce

Introduction
4.1 Trade Cycle
4.2 Supply Chain
4.3 E-Procurement
4.4 Implementing E-Procurement
4.5 Competitive Advantage
4.6 E-Commerce Application in Manufacturing
4.7 E-Commerce Application in Wholesale

4.9 E-Commerce Application in Retail
4.10 E-Commerce Application in Service Sector

5. E-Commerce Technology

5.1 Introduction
5.2 IT infrastructure
5.3 Internet
5.4 Middleware
5.5 Intranet
5.6 Extranet
5.7 VPN
5.8 Firewall
5.9 Cryptography
5.10 Digital Signature
5.11 Digital Envelope
5.12 Digital certificates
5.13 Contents

6. Electronic Payment System

6.1 Introduction
6.2 Electronic Payment Mechanism
6.3 Types of Payment System
6.4 Risks Associated with Electronic Payment
6.5 Risk Management option
6.6 Payment Gateway
6.7 Issues of Electronic Payment Technology

6.8 Recommendations
6.9 Internet Banking
6.10 Security Requirement
6.11 Secure Socket Layer
6.12 Biometrics

7. Security Issues in E-Commerce
7.1 Introduction
7.2 E-commerce security issues
7.3 Risks involved in e-commerce
7.4 Protecting e-commerce system
7.5 Common E-commerce Security Tools
7.6 Client server Network security
7.7 Data and Message Security

8. Current Trends in Electronic World
8.1 E-waste
8.2 E-Surveillance
8.3 E-governance

Books Recommended

Sl.No	Name of Authors	Title of the Book	Name of the publisher
01	U.S Pandey and S Sukla	E-commerce and Mobile Commerce Technology By	S.Chand
02	A.K.Pandey	Concepts of e-commerce	Katson
03	Bhushan Dewan	e-commerce	S.Chand & Company Ltd

PR-1 NETWORK SECURITY LAB

Practical	**4 Periods per week**	**Term Work**	**25 Marks**
Total Periods	**60 Periods**	**Term End Exam**	**50 Marks**
Examination	**3 Hours**	**TOTAL MARKS**	**75 Marks**

CONTENTS

LIST OF PRACTICALS

1. *Installation and comparison of various anti virus software*
2. Installation and study of various parameters of firewall.
3. Writing program in C to Encrypt/Decrypt using XOR key.
4. Study of VPN.
5. Study of various hacking tools.
6. Practical applications of digital signature

PR-2 IoT LAB

Practical	**4 Periods per week**	**Term Work**	**50 Marks**
Total Periods	**60 Periods**	**Term End Exam**	**50 Marks**
Examination	**3 Hours**	**TOTAL MARKS**	**100 Marks**

CONTENTS

1. Basics of C language using Arduino IDE
   - Understating basics of Arduino IDE
   - Variables, datatype, loops, control statement, function

2. Practical using Arduino-interfacing sensors
   - Interfacing Light Emitting Diode(LED)- Blinking LED
   - Interfacing Button and LED – LED blinking when button is pressed
   - Interfacing Light Dependent Resistor (LDR) and LED, displaying automatic night lamp
   - Interfacing Temperature Sensor(LM35) and/or humidity sensor (e.g.DHT11)
   - Interfacing Liquid Crystal Display(LCD) – display data generated by sensor on LCD
   - Interfacing Air Quality Sensor-pollution (e.g. MQ135) – display data on LCD , switch on LED when data sensed is higher than specified value.
   - Interfacing Bluetooth module (e.g. HC05)- receiving data from mobile phone on Arduino and display on LCD
   - Interfacing Relay module to demonstrate Bluetooth based home automation application. (using Bluetooth and relay).

Books Recommended:

Sl.No.	Name of the Author	Title of the Book	Name of the Publisher
1	Vijay Madisetti, ArshdeepBahga,	Vijay Madisetti, ArshdeepBahga,	UniversityPress
2	YashavantKanetkar, ShrirangKorde,	“21 Internet Of Things (IOT) xperiments”	
3	Neerparaj Rai	“Arduino Projects For Engineers”	

PR-3 PROJECT PHASE – II

Practical	**10 Periods per week**	**Term Work**	**50 Marks**
Total Periods	**150 Periods**	**Term End Exam**	**100 Marks**
Examination	**3 Hours**	**TOTAL MARKS**	**150 Marks**

RATIONALE

Students' Project Work aims at developing innovative skills in the students whereby they apply the knowledge and skills gained through the course covered in many subjects and Labs, by undertaking a project. The prime emphasis of the project work is to understand and apply the basic knowledge of the principles of software engineering/ Hardware design and practices in real life situations, so as to participate and manage a large software engineering projects and /or appropriate Hardware with embedded software, in future. Entire Project spreads over 5th and 6th Semester. Part of the Project covered in 5th Semester was named as *Project Phase-I* and balance portion to be covered in 6th Semester shall be named as *Project Phase-II*.

OBJECTIVES

After undergoing the Project Work, the student will be able to:

- Implement the theoretical and practical knowledge and skills gained through various subjects/courses into an application suitable for a real practical working environment, preferably in an industrial environment.
- Develop software packages or applications and implement these for the actual needs of the community/industry.
- Identify and contrast gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge as required.
- Carry out cooperative learning through synchronous guided discussions within the class in key areas, asynchronous document sharing and discussions, as well as prepare collaborative edition of the final project report.
- To achieve real life experience in software/hardware design.
- To develop the skill of writing Project Report

Project Phase-I and Phase-II

The Project work duration covers 2 semesters(5th and 6th sem). The Grouping of students, selection of Project, assignment of Project Guide to the Group was done in the beginning of 5th sem under Project Phase-I. The students were allowed to study literature, any existing system and then define the Problem/objective of the Project. Requirements specification, DFD and Design of the system also have to be complete in Phase-I. Coding may also begin in this phase. Project Milestones are to be set so that progress can be tracked .

In Phase-II Coding, Testing, Documentation and Implementation have to be complete. Project Report have to be prepared and complete in Phase-II. All Project reports should be organized uniformly in proper order, irrespective of group. Teacher Guides can make suitable alteration in the components of Task and schedule.

At the end of Project Phase-II in 6th semester there shall be one presentation by each group on whole Project work undertaken by them.

A suggestive criterion for assessing student performance by the external (preferably person from industry) and internal (teacher) examiner is given in table below:

Sl. No.	**Performance Criteria**
1.	Selection of project assignment
2.	Planning and execution of considerations
3.	Quality of performance
4.	Providing solution of the problems or production of final product
5.	Sense of responsibility
6.	Self expression/ communication/ Presentation skills
7.	Interpersonal skills/human relations
8.	Report writing skills
9	Viva voce

The teachers are free to evolve other criteria of assessment, depending upon the type of project work.

It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organisations to such an exhibition.

The Project Report need to be prepared as per standard format and following is the indicative format. The Teacher Guide may make minor alteration keeping the sense in tact.

Organisation of Project Report

1. Cover page:
   It should contain the following (in order)
   (i) Title of the Project
   (ii) "Submitted in partial fulfillment of the requirements for the Diploma in <Branch Name>"
   (iii) By Name of the Student(s)
   (iv) Logo of the Institution
   (v) Branch Name/Depart Name and Institution Name with Address
   (vi) Academic Year
2. 1st Inner page
   Certificate:
   It should contain he following
   "this is to certify that the work in this Project Report entitled <Project Title> by <Name of student(s)> jas been carried out under my supervision in partial

fulfillment of the requirements for the Diploma in <Branch Name>" during session <session > in <Branch /Department Name> of <Institute name> and this work is the original work of the above student(s).

Seal and signature of the Supervisor/Guide with date

3. 2nd Inner Page
   Acknowledgement by the Student(s)
4. Contents.
5. Chapter wise arrangement of Reports
6. Last Chapter: Conclusion
   It should contain
   (i) Conclusion
   (ii) Limitations
   (iii) Scope for further Improvement
7. References

Pr-4 LIFE SKILL

(Common to All Branches)

Practical	**2 Periods per week**	**Sessional**	**25 Marks**
Total Periods	**30 Periods**	**Total Marks**	**25 Marks**

Objective: After completion of this course the student will be able to**:**

- Develop team spirit i.e. concept of working in team
- Apply problem solving skills for a given situation
- Use effective presentation techniques
- Apply task management techniques for given projects
- Enhance leadership traits
- Resolve conflict by appropriate method
- Survive self in today's competitive world
- Face interview without fear

DETAIL CONTENTS:

1. SOCIAL SKILL

Society, Social Structure, Develop Sympathy and Empathy
Swot Analysis – Concept, How to make use of SWOT
Inter personal Relation**:** Sources of conflict, Resolution of conflict ,
Ways to enhance interpersonal relation

2. PROBLEM SOLVING

Steps of Problem solving**:**

- Identify and clarify the problem,
- Information gathering related to problem,
- Evaluate the evidence,
- Consider alternative solutions and their implications,
- Choose and implement the best alternative,
- Review
- Problem solving techniques:

1) Trial and error, 2) Brain storming, 3) Lateral (Out of Box) thinking

3. PRESENTATION SKILL

Body language , Dress like the audience
Posture, Gestures, Eye contact and facial expression. STAGE FRIGHT,
Voice and language – Volume, Pitch, Inflection, Speed, Pause
Pronunciation, Articulation, Language, Practice of speech.
Use of AV aids such as Laptop with LCD projector, white board etc.

4. GROUP DISCUSSION AND INTERVIEW TECHNIQUES

Group Discussion:
Introduction to group discussion, Ways to carry out group discussion,
Parameters— Contact, body language, analytical and logical thinking,
decision making
Interview Technique :
Dress, Posture, Gestures, facial expression, Approach
Tips for handling common questions.

5. WORKING IN TEAM

Understand and work within the dynamics of a groups.
Tips to work effectively in teams,

Establish good rapport, interest with others and work effectively with them to meet common objectives,
Tips to provide and accept feedback in a constructive and considerate way ,
Leadership in teams, Handling frustrations in group.

6. TASK MANAGEMENT

Introduction, Task identification, Task planning , organizing and execution, Closing the task

PRACTICAL

List of Assignment: *(Any Five to be performed including Mock Interview)*

1. SWOT analysis:-

Analyse yourself with respect to your strength and weaknesses, opportunities and threats. Following points will be useful for doing SWOT.

a) Your past experiences,
b) Achievements,
c) Failures,
d) Feedback from others etc.

2. Solve the True life problem assigned by the Teacher.

3. Working in a Team

Form a group of 5-10 students and do a work for social cause e.g. tree plantation, blood donation, environment protection, camps on awareness like importance of cleanliness in slum area, social activities like giving cloths to poor etc.(One activity per group where Team work shall be exhibited)

4. Mock Interview

5. Discuss a topic in a group and prepare minutes of discussion.

6. Deliver a seminar for 5 minutes using presentation aids on the topic given by your teacher.

7. Task Management

Decide any task to be completed in a stipulated time with the help of teacher. Write a report considering various steps in task management (with Break up into sub tasks and their interdependencies and Time)

Note: -1. Please note that these are the suggested assignments on given contents/topic. These assignments are the guide lines to the subject teachers. However the subject teachers are free to design any assignment relevant to the topic.

Note: -2. The following Topics may be considered for Seminar/GD in addition to other Topics at the discretion of the Teacher.

(Comparison with developed countries, Occupational Safety, Health Hazard, Accident & Safety, First-Aid, Traffic Rules, Global Warming, Pollution, Environment, Labour Welfare Legislation, Labour Welfare Acts, Child Labour Issues, Gender Sensitisation ,Harassment of Women at Workplace)

METHODOLOGY:

The Teacher is to explain the concepts prescribed in the contents of the syllabus and then assign different Exercises under Practical to the students to perform.

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the Publisher

01	E.H. Mc Grath , S.J	Basic Managerial Skills for All	PHI
02	Lowe and Phil	Creativity and problem solving	Kogan Page (I) P Ltd
03	Adair, J	Decision making & Problem Solving	Orient Longman
04	Bishop , Sue	Develop Your Assertiveness	Kogan Page India
05	Allen Pease	Body Language	Sudha Publications Pvt. Ltd.

Equipment List

(For a Batch of 30 students)

1. Desktop PC with UPS – 30 numbers
2. Software such as Antivirus, Firewall
3. Arduino Uno, sensors(Bluetooth module(HC05), MQ135, DHT11,breadboard , LCD, 2-relay module etc) (1 kit for group of 4 students)
4. Consumables : LED, button, connecting wires, LDR, LM35, battery
5. Other software and Hardware as required for Project work