STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA									
TEACHING AND EVALUATION SCHEME FOR 6th Semester (Information Technology)(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. Software Testing, 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) SOFTWARE TESTING (ELECTIVE)

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

Topic wise distribution of periods

Sl. No.	Topics	Periods
1	INTRODUCTION TO S/W TESTING	08
2	S/W VERIFICATION AND VALIDATION	06
3	FUNCTIONAL TESING TECHNIQUES	10
4	STRUCTURAL TESTING TECHNIQUES	10
5	GRAY BOX TESTING	06
6	REDUCING NUMBER OF TEST CASES	06
7	LEVELS OF TESTING	06
8	AUTOMATED TESTING	08
	TOTAL	**60**

A.RATIONALE

Software Testing has emerged as a special branch of software engineering which focuses on different techniques used for testing a software. Success of software lies on this step which is very critical in nature. This paper mostly deals with the different testing strategies and methods.

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

- Understand the basic need of software testing.
- Learn about different techniques of authenticity software development.
- Learn about the kinds of Tools available for software testing.
- Understand different validation and verification procedure of software for certification.
- Learn about basic concepts of automated testing.
- Understand how to make a developed software ready for implementation

C.COURSE CONTENT

1. Introduction to S/w Testing

1.1 Introduction

1.2 Testing Process

1.3 What is s/w Testing
1.4 Purpose of testing
1.5 who should test
1.6 what to test
1.7 selection of good test case
1.8 Measurement of progress
1.9 Incremental testing approach
1.10 Basic terminology
1.11 Testing Life cycle
1.12 when to stop testing
1.13 Principle of testing
1.14 Limitation of testing
1.15 Availability of testing tool, techniques, metrics

2. S/W verification and Validation
2.1 Introduction
2.2 Verification and Validation
2.3 QA and QC
2.4 V&V Limitations
2.5 Categorizing V&V techniques
2.6 Role of V&V in SDLC
2.7 Proof of correctness, Simulation & Prototyping
2.8 Requirement Tracing, s/w v&v planning
2.9 s/w testing review
3.0 Independent v&v contractor
3.1 positive &negative effect of v&v on projects
3.2 Standard for s/w test documentation

3. Functional Testing Techniques
3.1 Introduction
3.2 BVA
3.3 Equivalence class testing.
3.4 Decision Table based testing
3.5 Cause effect graphing technique
3.6 Comparison of techniques

4. Structural Testing Techniques
4.1 Introduction

4.2 static vs. dynamic testing
4.3 Dynamic WB testing techniques
4.4 Mutation Testing vs. error seeding
4.5 Comparison of BB and WB testing techniques
4.6 Comparison of WB testing techniques
4.7 Advantages

5. Gray Box Testing
5.1 Introduction
5.2 What is Gray Box Testing
5.3 Definitions of Gray Box Testing
5.4 Comparison of WB, BB, GB

6. Reducing Number of Test Cases
6.1 Prioritization Guidelines
6.2 Priority Category Schemes
6.3 Risk Analysis
6.4 Regression Testing
6.5 Prioritization of test cases for regression Testing
6.6 Regression Testing Techniques

7. Levels of Testing
7.1 Introduction
7.2 Unit, Integration, System, acceptance testing
7.3 Integration Testing, classification, decomposition
7.4 Call graph, path based integration

7.5 system Testing

8. Automated Testing

8.1 Automated testing
8.2 Considerations during testing
8.3 Types of Testing Tools- static vs Dynamic
8.4 problems with manual Testing
8.5 Benefits of Automated Testing
8.7 Disadvantages of Automated testing
8.8 Skill needed for using automated tools
8.9 Test Automation
8.10 Debugging
8.11 criteria for selection of test tools
8.12 steps for tool selection

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
01	Er. Rajiv Chopra	Software Testing	S.K Kataria &sons

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	PHI

		All	
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