

Programme : Diploma in Computer Engineering / Information Technology

Programme Code : 06/26

Name of Course : Project Seminar

Course Code : CM481

Class Declaration : YES

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Progressive Assessment of Seminar.	–	–	–	–
Marks	50	–	50	–	50

Course Rationale:

This Subject tends to mould students towards integrating the knowledge acquired throughout and applying it to the real life projects, in order to gain the confidence of acquiring Engineering skills and thus fulfill the objective of Diploma Programme.

Course Outcomes:

After undergoing this course, the student will demonstrate the following Course Outcomes :

1. After undergoing this course, the student will demonstrate the following Course Outcomes :
2. Apply appropriate design methodology to the Projects.
3. Make use of designing tools.
4. Conduct feasibility study and cost estimation.
5. Create , test and debug working model.
6. Compile and Write a Software Project Report.
7. Work in team and deliver presentations.

Subject Guideline regarding implementation:

Sr No.	Name of Experiment/Assignment
1	Subject would contain two components : 1. Seminar 2. Project
2	Seminar Should be on Technical Topic only. It can be taken on Subject to be continued as project or any other technical Topic. Evaluation of Seminar should be based on Topic Selection, Technical Contents, Content Understanding, Content Delivery and Response to the Questions.
3	Project can be Hardware or Software or Combination of Both. It must involve logic building and application of various technologies learnt during Diploma Completion
4	May Form a team of students as per industry roles- Developers, testers, Business Analysts, Project managers, Customers. Assign this team a project.Each group is to be assigned a guide faculty. Project titles are to be decided in co-ordination with Faculty.
5	Students Must Submit One Hard copy and one softcopy each of Seminar and Project.
6	These titles are to be covered in Project Report: a) Problem Definition b) Platform and/Hardware Specifications c) Feasibility Study. d) Various Design UML charts/diagrams as applicable like Use Case Diagram, Activity Charts, Class Hierarchy, DFD, CFD, ER-Diagrams or any other e) Cost Estimation f) Time Estimation g) Limitations h) Use i) Future Scope/Extendability j) Books/References/WebSites (Other titles may be added and used as applicable, based on the nature of project)
7	Student should maintain a project diary and note down all the progress steps and details in the diary. Faculty should check the diary each week and accordingly interact with students based on the progress shown and keep proper notings.Impart proper guidance. This will assist in proper evaluation of students.

CO-PO Matrix :

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	1	3	1	2	2	1	2	3	3	3
2	1	3	2	3	2	1	2	3	3	3
3	1	3	3	3	2	1	2	3	3	3
4	2	3	2	3	2	1	2	3	3	3
5	–	3	3	3	2	1	2	3	3	3
6	–	2	–	3	2	1	2	3	3	3
7	–	2	1	3	2	–	2	3	3	3

Programme : Diploma in Computer Engineering

Programme Code : 06/26

Name of Course : Java Programming II

Course Code : CM482

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	20	80	25	–	25

Course Rationale:

This course introduces students to intermediate and advanced features of the Java programming language. Student will know how to implement graphical user interfaces using Java components. In the Era of Web technology it is essential for every diploma Engineer to have knowledge of Internet programming. This course covers advanced features of JAVA.

Course Outcomes:

Students should be able to

1. Develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
2. Develop client/server applications using TCP/IP and UDP socket programming.
3. Write Java programs using databases with Java Data Base Connectivity (JDBC) as interface.
4. Create and use Java Bean.
5. Develop applications for Remote Method Invocation (RMI).

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : Event Handling and Introducing the AWT		
1.Enlist various AWT components. 2.Practice event handling. 3.Describe various handling events by extending AWT. 4.Design a form containing various AWT components and apply event handling..	1.1 Two event handling mechanisms, The delegation Event Model 1.2 Event classes,Sources of Events, Event Listener Interfaces , 1.3 Using the Delegation Event Model, Adapter classes, Inner classes , 1.4 AWT classes, Window fundamentals, Working with frame Windows, Creating a frame Window in an Applet, Creating windowed program, Display information within a window, 1.5 Working with graphics, Working with color, Setting the paint mode , 1.6 Working with Fonts, Managing text output using Font Metrics, Exploring text graphics 1.7 Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists, Managing scroll Bars, Using a Text Field, Using a Text Area 1.8 Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes, File Dialog, 1.9 Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout Managers	14
Unit 2: Swing Component		
1.Demonstrate working of applet 2.Use swing components in applet.	2.1 The Tour of Swing : 2.2 Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables, Exploring the Swings and,Software, Input, Process,	4
Unit 3: Networking Basics:		
1.Define socket. 2. Compare various sockets. 3.Write a java programs for client server communication using sockets.	3.1 Socket overview, client/server, reserved sockets, proxy servers, internet addressing 3.2 Inetaddress ,Factory methods, instance method TCP/IP Client Sockets 3.3 What is URL Format? URL connection, TCI/IP Server Sockets 3.4 Datagrams :Datagram packets Datagram server and client Net worth	06

Unit 4: Java DataBase Connectivity Client/Server		
<p>1. Develop a program for steps to connect a database.</p> <p>2. Describe the Basics of JDBC.</p> <p>3. Develop program to use JDBC to query a database and modify</p>	<p>4.1 Java as a Database front end . Database client/server methodology . Two-Tier and Three-Tier Database Design</p> <p>4.2 The JDBC API. The API Components Limitations Using JDBC (Applications vs Applets). Security Considerations A JDBC Database Example JDBC Drivers. JDBC-ODBC Bridge. JDBC Driver Types. Statement Interface and handling ResultSetObject</p>	10
Unit 5: JAVA Beans:		
<p>1.State advantages of Java Beans</p> <p>2..Develop your own Java Bean</p>	<p>5.1 What is Java Beans? Advantages of Java Beans</p> <p>5.2Application Builder Tools, The Bean Developer kit(BDK), JAR Files, Introspection, Developing a simple Bean Using Bound properties Using the BDK</p> <p>5.3Using Bound properties, Using the Bean Info Interface, Constrained properties</p> <p>5.4 Persistence Customizers, The Java Beans API, Using Bean Builder</p>	6
Unit 6: Remote Method Invocation Internet and Principles of Programming Language		
<p>1.Compare Distributed and Non distributed Java Programs</p> <p>2.Draw RMI Architecture</p> <p>3.Define stubs and skeletons</p> <p>4.Demonstrate working RMI Client side call backs</p>	<p>6.1Introduction to Distributed Computing with RMI : Goals, Comparison of Distributed and Non distributed Java Programs</p> <p>6.2 Java RMI Architecture Interfaces: The Heart of RMI, RMI Architecture Layers, Stub and Skeleton Layer, Remote Reference Layer, Transport Layer</p> <p>6.3 Naming Remote Objects, Using RMI, Interfaces, Implementation,Stubs and Skeletons, Host Server, Client.</p> <p>6.4 Running RMI System, Parameters in RMI, Parameters in a Single Java Virtual Machine, Primitive Parameters, Object Parameters, Remote Object Parameters</p> <p>6.5 RMI Client-Side Call backs, Distributing and Installing RMI Software, Distributing RMI Classes, Automatic Distribution of Classes, Firewall Issues</p>	8
Total Hrs		48

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1	Program to design a form using various controls.	Event Handling and Introducing the AWT	02
2	Program to design a form and handle various events related to each control.	Event Handling and Introducing the AWT	02
3	Program to display any string using available Font and Font metrics class and their methods.	Event Handling and Introducing the AWT	02
4	Program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box.	Event Handling and Introducing the AWT	02
5	Program to design a form using basic swing components.	Swing Component	02
6	Program to demonstrate the use of tabbed panes and scroll panes in Swing	Swing Component	02
7	Program to map Directory tree and Table.	Swing Component	02
8	An Application program to make connectivity with database using JDBC API.	JDBC	01
9	Application programs to send queries through JDBC bridge and handle result.	JDBC	02
10	Program to retrieve hostname using methods in Inet Address class.	Networking Basics	01
11	Program to demonstrate use of URL and URL Connection class for communication.	Networking Basics	02
12	Program that demonstrates TCP/IP and UDP based communication between client and server.	Networking Basics	04
13	Program to develop simple bean using BDK (Bean Developing Kit).	Java Beans	04
14	Create a Client/Server application using RMI	RMI	04
		Total Hrs	32

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Event Handling and Introducing the AWT	06	05	09	20
2	Swing Component	02	02	04	08
3	Networking Basics	04	04	04	12
4	Java DataBase Connectivity Client/Server	06	06	06	18
5	JAVA Beans	02	02	04	08
6	Remote Method Invocation	06	04	04	14
	Total	26	23	31	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests)	20	10	Test Answer sheets	1,2,3,4,5,6
				TOTAL	20	10		
	(Term End Examination)	End Exam		End Of the Course	80	28	Theory Answer sheets	1,2,3,4,5,6
Direct Assessment Practical	-	-	Students	-	-	-	-	1,2,3,4,5,6
		Journal Writing		Assignments	25	-	Journal	
	(Term End Examination)	End Exam		TOTAL	25	10		
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form		1,2,3,4,5,6	
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Demonstration	07
2	Result	08
3	Viva voce	10
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	-	1	3	1	2	-	-	1	2	-
2	-	1	3	1	2	-	-	1	2	-
3	-	1	3	1	2	-	-	1	2	-
4	-	1	3	1	2	-	-	2	2	-
5	-	1	3	1	2	-	-	2	2	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Author	Title	Publication
1	Jaworski, Techmedia	Java 1.2 Unleased	–
2	The Complete IDIOT's Guide To JAVA 2	Michael Morrison	–
3	Keyur Shah	Java2 Programming	Tata McGraw hill
4	Cay S. Horstmann	Core Java Volume II	Pearson
5	Joseph L. Weber	Special edition using java1.2	PHI
6	Patrick Naughton- Herbert Schildt	The Complete Reference Java 2 (Fifth Edition)	Tata – McGraw hill

E-References:www.howstuffworks.com

1. http://www.tutorialspoint.com/computer_fundamentals
2. <http://ecomputernotes.com/fundamental/introduction-to-computer/what-are-characteristic-of-a-computer>
3. https://www.tutorialspoint.com/data_structures_algorithms/algorithms_basics.htm
4. <http://www.officetutorials.com>

Programme : Diploma in Computer Engineering

Programme Code : 06/26

Name of Course : Software Engineering

Course Code : CM483

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	20	80	–	25	25

Course Rationale:

Software has become the key element in the evolution of Computer-based systems and products. Over the past 50 years, software has evolved from a specialized problem solving and information analysis tool to an industry in itself. Software is composed of programs, data and documents. Each of these items comprises a configuration that is created as part of the software engineering process. The intent of software engineering is to provide a framework for building software with higher quality.

Course Outcomes:

Students should be able to

1. Select and use specific SDLC model for assigned project/ case study.
2. Prepare system/functional requirements with respect to customer/user requirements.
3. Convert analysis model into design model.
4. Estimate size and cost of given software project.
5. Apply project management and quality assurance principles to software project development.

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : Software Engineering Concepts		
<p>1. Define Software and its characteristics</p> <p>2 Identify and Demonstrate need Umbrella Activities.</p> <p>3. Analyze various process, methods and tools</p> <p>4. Choose and apply domain specific life cycle model for software product development.</p>	<p>1.1 The Evolving Role of Software.</p> <p>1.2. Software Characteristics and Application.</p> <p>1.3 Framework of Umbrella Activities The Process.</p> <p>1.4 Software Engineering: A Layered Technology -Process, Methods, and Tools.</p> <p>1.5 A Generic View of Software Engineering, The Software Process</p> <p>1.6 Software process models -, Prototyping model , RAD Model Evolutionary Software Process Models, Incremental model , Spiral model, WINWIN spiral model, Concurrent development model ,Component-based development model, Formal methods model, Fourth generation techniques .Component based Development(CBD),Aspect-Oriented Software Development ,Agile Process Model: Extreme Programming, Adaptive Software Development(ASD)</p>	06
Unit 2: Requirement Engineering		
<p>1. Define Customer need –Requirement and state various tasks</p> <p>2. Use various requirement gathering techniques</p> <p>3. Use and Design use case for Requirement Elicitation</p> <p>4. Validate Requirement and Build Analysis model (SRS)</p>	<p>2.1 Requirement Engineering Tasks: Inception, Elicitation, Elaboration, Negotiation, Specification, Validation.</p> <p>2.2 Initiating the Requirement Engineering Process: Stakeholders, Recognizing Multipoint Viewpoint, Working towards Collaboration.</p> <p>2.3 Eliciting Requirements: Collaborative Requirements Gathering, Quality Function Deployment ,User Scenarios ,Elicitation Work Products.</p> <p>2.4 Developing Use-Cases</p> <p>2.5 Building the Analysis model.</p> <p>2.6 Negotiating Requirement .</p> <p>2.7 Validating Requirement</p>	08
Unit 3: Software Project Management		
<p>1 .Recognize need of Software project Management</p> <p>2. Apply various tools and techniques for Estimation</p> <p>3 .To Determine Size using Function -Point metric and Cost Estimation using CO-COMO model.</p> <p>4. To Identify and categorize the various risks face by an organization</p> <p>5. To classify and resolve the risk in proactive manner.</p> <p>6. To design and implement RMMM Plan</p>	<p>3.1 The Management Spectrum: 4 P's and Significance</p> <p>3.2 The People: The Stakeholders ,Team Leader, Software Team, Agile Team ,Communication issues</p> <p>3.3 The Process: Software Scope , Problem Decomposition ,Decomposition Techniques: LOC and FP estimation, Effort estimation</p> <p>3.4 Empirical Estimation Models: COCOMO, Putnam estimation model, Function-point models, Automated Estimation Tools.</p> <p>3.5 Risk Analysis and Management: Risk identification, Risk projection, Risk assessment, Risk management and monitoring, Risk Refinement and Mitigation, RMMM Plan.</p>	10

Unit 4: Project Scheduling		
<p>1. Employ group working skills.</p> <p>2. Demonstrate the different language</p> <p>3. To design task network and implement it generations program.</p>	<p>4.1 Basic concepts,-Basic principles :The relationship between people and effort</p> <p>4.2 An empirical relationship:-Effort distribution,Defining a task set Examples</p> <p>4.3Selecting the task set :Selecting software engineering tasks</p> <p>4.4 Defining a task network ,Tracking the schedule -Earned value analysis-Error tracking, Tracking Progress for an OO Project .</p>	06
Unit 5:Software Quality Assurance		
<p>1.Measure process effectiveness and efficiency to track performance quality. of operating system.</p> <p>2.Make effective use of UML, along with design strategies.</p> <p>3.Evaluate the quality of the requirements, analysis and design work done during the module.</p> <p>4. To imply ISO 9001 and Six Sigma in project process.</p> <p>5.To design Data Flow Diagram for different projects.</p> <p>6. To design and apply SQA Plan.</p>	<p>5.1 Quality concepts ,The quality movement, Software quality assurance ,SQA activities, Software reviews</p> <p>5.2 Defect amplification and removal: Formal technical reviews, The review meeting, Review reporting and record keeping</p> <p>5.3 Software reliability: Measures of reliability and availability Software reliability: Measures of reliability and availability</p> <p>5.4The ISO approach to quality assurance system: The ISO 9001 standard ,Six Sigma Software Engineering, The SQA plan.</p> <p>5.5 Functional modeling and information flow: Data Flow diagrams, UML Modeling :Use-Case ,Class Diagrams , Sequence Diagrams</p>	8
Unit 6: Software Testing Techniques and Maintenance		
<p>1. Test software by developing various test cases for software project.</p> <p>2.To Describe software maintenance process.</p> <p>3.To apply unit, integration, system testing for software project.</p> <p>4. To Compare Reverse and Re-engineering</p>	<p>6.1 Software testing Fundamentals ,Testing objectives ,Testing principles ,Testability</p> <p>6.2 White box testing :Basis path testing , Flow graph notation, Cyclomatic complexity , Graph matrices , Control structure testing, Condition testing , Data flow testing, Loop testing</p> <p>6.3 Black box testing: Graph based testing methods.</p> <p>6.4Testing documentation, Testing for real time systems.</p> <p>6.51.5 Software Maintenance: A definition of software maintenance, Maintenance Characteristics, Maintainability, Maintenance tasks, Maintenance side effects, Software Configuration Management</p> <p>6.6 Reverse engineering and Re-engineering.</p>	8
Total Hrs		48

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1	Application and use of studied process models such as Agile, CBD,AOSD.	Software Engineering Concepts	02
2	Define the project title with bounded Scope of Your Project.	Software Engineering Concepts	02
3	Design Project Plan and SQA Plan.	Software Project Management	02
4	To Develop Software Requirement Specification using Use-Case Scenario.	Requirement Engineering and Design	04
5	To perform data design using design concepts eg. DFD.	Software Quality Assurance	02
6	To Draw the Activity Diagram to represent a flow from one activity to another activity and draw ER diagram.	Project Scheduling	04
7	To Draw class diagram, Sequence diagram, Collaboration diagram, State Transition Diagram for assigned project (eg. Library Management).	Software Quality Assurance	06
8	To determine Size using Function-Point metric and Cost Estimation using COCOMO model.	Software Project Management	06
9	To Test software by developing various test cases for software project and practice it on the project.	Software Testing Techniques and Maintenance	04
		Total Hrs	32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Software and Software Engineering	Class room teaching
2	Project management concepts	Class room teaching, laboratory demonstration
3	Project Management estimation and planning	Class room teaching, laboratory work
4	Project Scheduling and tracking	Class room teaching, laboratory work
5	Project Management estimation and planning	Class room teaching, laboratory work
6	Software Testing Techniques and Maintenance	Class room teaching, laboratory work

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Software and Software Engineering of Computer	03	03	04	10
2	Project management concepts	05	03	03	11
3	Project Management estimation and planning	03	03	02	08
4	Project Scheduling and tracking	04	04	05	13
5	Software Quality assurance	11	06	06	25
6	Software Testing Techniques and Maintenance	06	03	04	13
Total		32	22	26	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests)	20	10	Test Answer sheets	1,2,3
				TOTAL	20	10		1,2,3
	(Term End Examination)	End Exam		End Of the Course	80	28	Theory Answer sheets	1,2,3
Direct Assessment Practical	Continuous Assessment	ST	Students	One skill test at end of term	10	–	Practical Answer sheets	4,5,6,
				Assignments	15	–	Journal	
	TOTAL	25		10				
	(Term End Examination)	End Exam	End Of the Course	25	10	Practical Answer Sheets	4,5,6	
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form		1,2,3 4,5,6	
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Evaluation	05
2	Practical Execution	10
3	Viva voce	05
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	–	2	2	2	–	–	–	–	–	–
2	–	2	2	–	–	–	–	2	3	–
3	–	2	2	2	–	–	–	2	2	–
4	–	3	2	3	–	–	–	2	2	–
5	–	2	2	3	–	–	–	2	2	–
6	–	2	2	2	–	–	–	–	–	–

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Author	Title	Publication
1	Roger S. Pressman	Software Engineering 6th Edition	Mc. Graw Hill
2	Jawadekar	Software Engineering	Wiley India
3	Richard Fairly	Software Engineering Concepts	Mc. GrawHill

E-References:

1. www.rspa.com/spi
2. www.mhhe.com/engineering/pressman/

Programme : Diploma in Computer Engineering/Information technology

Programme Code : 06/26/07

Name of Course : Advanced Computer Network

Course Code : CM484

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	03 Hrs.	–	–	–
Marks	20	80	–	25	25

Course Rationale:

This course is aimed at providing the students with conceptual understanding of issues of Computer Networks with respect to Network and above layers of TCP/IP model. It aims at providing in depth knowledge of Network Organization, addressing, Security and role of various protocols in Internet working Environment.

Course Outcomes:

Students should be able to

1. Create and analyze network for small scale organization.
2. Create and configure subnets in network.
3. Configure DHCP and static IP addresses for LAN
4. Use network analyzer tools.
5. Differentiate various routing protocols.
6. Illustrate various security and protection techniques in the Networking Environment.

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Section I		
Units 1 : Network Layer I		
1. Define Logical addresses. development. 2. Explain NAT and its use. 3. Distinguish between IPV4 and IPV6 4. Choose between RARP, BOOTP and DHCP.	1.1 Logical Addressing :IPv4 Addresses- Address space, Notations, classful addressing, classless addressing, , Network address translation,IPv6 Addresses- Structure, Address space 1.2 Internetworking- Need for Network Layer, Internet as a Datagram network, Internet as a Connectionless Network, IPv4- Datagram, Fragmentation, Checksum, OptionsIPv6- Advantages, Packet format, Extension headers, Transition from IPv4 to IPv6- Dual Stack, Dual Stack, Tunneling, Header translation 1.3 Address Mapping- Mapping Logical to Physical Addresses- ARP, Mapping Physical to Logical Addresses – RARP,BOOTP and DHCP.	10
Unit 2: Network Layer II		
1. List error reporting and query messages. 2. Compare Direct and Indirect delivery. 3. Prioritize different routing 4. Explain the use of routing table. 5. Design network according to networking design criterion.	2.1 ICMP- Types of messages, Message format, Error reporting, Query White box testing : Static testing , Structural testing 2.2 Delivery- Direct vs. Indirect Delivery, Forwarding- forwarding Techniques, Forwarding Process, Routing Table, Uncast Routing Protocols-Optimization, Intra and Inter domain Routing, Distance Vector Routing, Link State Routing, Path Vector Routing, Introduction to multicasting and broadcasting.	10
Unit 3: Transport Layers		
1. Explain Process to process delivery. 2. Compare Multiplexing and demultiplexing, Connection oriented and connectionless services. 3. Discover TCP and UDP protocols. 4. Categorize network traffic. 5. Prove best congestion control method. 6. Explain techniques to improve QOS.	3.1 Process to Process Delivery- Client/Server 12 Paradigm, Multiplexing and Demultiplexing Connectionless vs. Connection-Oriented Service, Reliable vs. Unreliable 3.2 Three Protocols, User Datagram Protocol (UDP)- Well Known Ports for UDP , User Datagram, Checksum, UDP Operation, Use of UDP, TCP- TCP Services, TCP Features, Segment, A TCP Connection,Flow Control, Error Control, Congestion Control 3.3 Data Traffic- Traffic Descriptor, Traffic profiles 3.4 Congestion- Network Performance, Congestion Control-Open Loop Congestion Control, Closed Loop Congestion Control, Examples- Congestion Control in TCP and Frame Relay	12

Section II		
Unit 4: Application Layer I: DOMAIN NAME SYSTEM		
1. Define name space in WWW. 2. Recall working of internet. 3. Demonstrate caching works in DNS. 4. List the importance of DNS in internet. 5. Explain DDNS. 6. Apply the remote logging in troubleshooting networking problems. 7. Design an Email application 8. Compare POP and Imap. .Elaborate on FTP protocol	4.1 Name Space- Flat Name Space, Hierarchical Name Space, Domain Name Space- Label, Domain Name, Domain, Distribution Of Name Space- Hierarchy of Name Servers, Zone, Root Server, Primary and Secondary Servers 4.2 DNS in the Internet- Generic Domains, Country Domains, Inverse Domain, Resolution- Resolver, Mapping names to Addresses, Mapping Addresses to Names, Recursive resolution, Iterative Resolution, Caching 4.3 DNS Messages- Header, Types of Records- Question Record, Resource Record, Registrars, Dynamic, Domain Name Systems (DDNS), Encapsulation. 4.4 REMOTE LOGGING : Remote logging, Telnet 4.5 ELECTRONIC MAIL AND FILE TRANSFER: , Electronic Mail- Architecture, User Agent, Message Transfer Agent: SMTP, Message Access Agent: POP and IMAP, Web-based Mail 4.6 File Transfer- File Transfer Protocol (FTP), Anonymous FTP.	10
Unit 5: Application Layer II: WWW AND HTTP		
1. Illustrate how cookies work. 2. Differentiate between document and active document. 3. Explain the use of proxy server. 4. Demonstrate how network management is done.	5.1 Architecture- Client (Browser), Server, Uniform Resource Locator, Cookies. 5.2 Web Documents- Static Documents, Active Documents, HTTP- HTTP Transaction, Persistent vs. No persistent Connection, Proxy Server. 5.3 Network Management System- Configuration Management, Fault Management, Security Management	08
Unit 6: Cryptography and Security in the Internet		
1. Illustrate the importance of security. 2. Define cryptography. 3. Explain security services. 4. Justify the use of proxy firewall.	6.1 Introduction to Cryptography- Definitions, Categories, Symmetric Key Cryptography- Traditional Ciphers, Simple Modern Ciphers, Asymmetric -Key Cryptography- RSA, Diffie-Hellman. 6.2 Security Services- Message confidentiality, Message Integrity, Message Authentication, Message Nonrepudiation, Entity Authentication. 6.3 IP Security (IPSec)- Two modes, Two Security protocols, Security Association. 6.4 PGP- Security Parameters, Services, A Scenario, PGP Algorithms, Key Rings, PGP Certificates. 6.5 Firewalls- Packet filter firewall, Proxy firewall	12
Total Hrs		64

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Practical Hrs.
1	To Execute Network commands like ping, nmap, ip-config, trace route, netstat, finger, and route.	Units 1 : Network Layer I	04
2	Designing Networks and Sub networks.	Units 2 : Network Layer II	04
3	Configuring Static IP address. Configuring Dynamic IP address(DHCP)	Units 1 : Network Layer I	04
4	Study of Router, Gateway, Switches Specifications.	Unit 2: Network Layer II	02
5	Simulation of RIP Protocol	Unit 2: Network Layer II	02
6	Monitoring Network through Network Monitoring Tools.	Unit 3: Transport Layer	04
7	Write programs for execution of asymmetric and symmetric cryptography algorithms.	Unit 6:Cryptography and Security in the Internet	04
8	Study of available ISPs in India	Unit 4: Application Layer I: DOMAIN NAME SYSTEM Unit 5:Application Layer II:WWW AND HTTP	02
9	Configuring FTP Server.	Unit 5: System security	02
10	Configuring Telnet Server	Unit 4: Application Layer I: DOMAIN NAME SYSTEM Unit 5:Application Layer II:WWW AND HTTP	02
11	Practice use of data recovery tools.	Unit 4: Application Layer I: DOMAIN NAME SYSTEM Unit 5:Application Layer II:WWW AND HTTP	02
		Total Hrs	32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Network Layer I	Class room teaching, laboratory work
2	Network Layer II	Class room teaching, laboratory work
3	Transport Layer	Class room teaching, laboratory work
4	Application Layer I: DOMAIN NAME SYSTEM	Class room teaching, laboratory work
5	Application Layer II:WWW AND HTTP	Class room teaching, laboratory work
6	Cryptography and Security in the Internet	Class room teaching, laboratory work

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Network Layer I	08	02	02	16
2	Network Layer II	10	02	04	12
3	Transport Layer	10	02	00	14
4	Application Layer I: DOMAIN NAME SYSTEM	10	02	02	14
5	Application Layer II:WWW AND HTTP	10	02	02	12
6	Cryptography and Security in the Internet	10	02	-	12
	Total	58	12	10	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests will be computed)	20	10	Test Answer sheets	1,2,3,4,5,6
				Assignment	–		Assignment Book	–
				TOTAL	20	10		
	(Term End Examination)	End Exam		End Of the Course	80	28	Theory Answer sheets	1,2,3,4,5,6
Direct Assessment Practical	Continuous Assessment	ST	Students	One skill test at end of term	–	–	Practical Answer sheets	
				Assignments	25	–	Journal	1,2,3,4,5,6,
				TOTAL	25	10		
	(Term End Examination)	End Exam		End Of the Course	25	10	Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3,4,5,6
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Evaluation	10
2	Practical Execution	–
3	Viva voce	15
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	2	3	3	3	1	1	1	3	3	1
2	3	3	2	2	–	–	–	–	–	–
3	2	3	3	3	–	–	–	–	–	–
4	2	3	3	3	–	–	–	–	–	–
5	2	3	3	2	–	–	–	–	–	–
6	3	3	1	1	2	–	–	–	–	–

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Author	Title,Publisher, Year of publication	ISBN Number
1	Behrouz A.Forouzan	Data Communications and Networking Tata McGraw Hill Fourth Edition	9780073250328
2	Andrew S.Tanenbaum,	Computer Networks PHI Publications	9780131629592

E-References:

1. https://www.tutorialspoint.com/data_communication_computer_network//
2. <http://en.citizendium.org/wiki/Cryptography/>
3. <http://www.tutorialspoint.com/cryptography//>
4. <http://williamstallings.com/Extras/Security-Notes//>
5. <https://www.lifewire.com/tcp-headers-and-udp-headers-explained-817970//>

Programme : Diploma in Computer Engineering/Information technology

Programme Code : 06/26/07

Name of Course : Computer Security

Course Code : CM485

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	03 Hrs.	–	–	–
Marks	20	80	–	25	25

Course Rationale:

Computer security is one of the most important and relevant area of computing today. The requirement to address security in computer system design is an important design consideration in many of today's system. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threats to confidentiality, integrity and availability.

This course will introduce basic cryptography, fundamentals of computer/network security, risks faced by computers and networks, security mechanisms, operating system security, secure systems design principles. It focuses on concepts and methods associated with planning managing and auditing security at all levels including networks.

Course Outcomes:

Students should be able to

1. Identify various software threats and attacks on operating system and online/offline application software.
2. Adopt security measures for security of vital data.
3. Write and execute programs for encryption/decryption.
4. Describe applications of firewall, IP Security and Intrusion Detection System in computer security.
5. Install Hot-fix, patch, service pack for security software up gradations.

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : Introduction and Security trends Introduction and Security trends		
1. Identify threats to security. 2. List different types of attack. 3.Explain security basics 4.Compare various access controls.	1.1Threats to security: Viruses and worms, Intruders, Insiders, Criminal organizations, Terrorists, Information Warfare, A venues of attack, steps in attack 1.2Type of attack: Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hijacking, encryption attacks Malware: Viruses, Logic bombs 1.3 Security Basics - Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security 1.4 Access control: Discretionary, Mandatory, Role based Authentication: Introduction	08
Unit 2: Organizational /Operational Security		
1.Describe role of people in password selection. 2.Define Security Policies,standards and procedures 3.List different access controls 4.Explain Social engineering	2.1 Role of people in security: Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software/hardware, Access by non employees Security awareness, Individual user responsibilities 2.2 Security policies, standards, procedures and guideline 2.3 Physical Security: Access controls biometrics: finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns keystrokes 2.4 Social Engineering.	06
Unit 3: Cryptography and Public Key Infrastructure		
1.Describe various encryption algorithms 2.Demonstrate use of Steganography 3.Analyze Public key Infrastructure. 4.Compare different trust models.	3.1 Encryption algorithm /Cipher, Caesar's Cipher, Shift cipher, substitution software Vigenere cipher. 3.2 Transposition Techniques, Steganography 3.3 Hashing, SHA 3.4 Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, Digital Signatures, Keyescrow. 3.5 Public key infrastructures: basics, digital certificates, certificate authorities, registration authorities, step for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate 3.6 Centralized or decentralized infrastructure, private key protection. 3.7 Trust models: Hierarchical, peer to peer, hybrid	14

Unit 4: Network Security		
1.Demonstrate working of firewall 2.List different security topologies 3.Justify importance of email security	4.1Firewalls: working design principles trusted systems Kerberos 4.2 Security topologies - security zones, DMS, Internet, VLAN, security implication tunneling. 4.3 IP security: overview, architecture, IPSec, IPSec configuration, IPSec security. 4.4 Introduction Virtual Private Network 4.5 Email Security: security of email transmission, malicious code, spam, mail encryption.	14
Unit 5: System security		
1.Classify Intrusion detection systems 2.Define Hot fix,patch,service pack	5.1 Intruders, Intrusion detection systems (IDS). host based IDS, network based IDS 5.2 Operating system security: Operating system updates :hot fix, patch, service pack	06
Total Hrs		48

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Practical Hrs.
1	Study of any Antivirus Installation and Configurations	Units 1 : Introduction and Security trends	04
2	Study/Demo of Packet Sniffers	Units 1 : Introduction and Security trends	02
3	Study of Standard Vulnerabilities of Operating Systems. .	Units 1 : Introduction and Security trends	04
4	Study of IT Act(2000-2008) Study of Cyber Laws.	Unit 1: Introduction and Security trends	04
5	Write programs for encryption and decryption using different techniques(Minimum 02)	Unit 3: Cryptography and Public Key Infrastructure	02
6	Practice use of Remote Access tools	Unit 3: Cryptography and Public Key Infrastructure	02
7	Setting Operating System Firewall, its importance and Problems.	Unit 4: Network Security	02
8	Study setting of Security levels in email.	Unit 4: Network Security	02
9	Study of any intrusion detection S/W.	Unit 5: System security	02
10	Practice use of password cracking tools.	Unit 2: Organizational /Operational Security	02
11	Practice use of data recovery tools.	Unit 4:Network Security	02
12	Practice use of Digital Signatures	Unit 3:Cryptography and Public Key Infrastructure	02
		Total Hrs	32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Introduction and Security trends	Classroom teaching
2	Organizational/Operational security	Classroom teaching, laboratory work
3	Cryptography and Public Key Infrastructure	Classroom teaching
4	Network Security	Classroom teaching, laboratory work
5	System Security	Class room teaching, laboratory work

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction and Security trends	06	04	04	14
2	Organizational/Operational security	03	03	03	09
3	Cryptography and Public Key Infrastructure	10	08	06	24
4	Network Security	10	06	08	24
5	System Security	03	03	03	09
Total		32	24	24	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
	Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests will be computed)	20	10	Test Answer sheets
TOTAL					20	10		
(Term End Examination)		End Exam	End Of the Course		80	28	Theory Answer sheets	1,2,3,4,5,6
Direct Assessment Practical	Continuous Assessment	—	Students	—	—	—	—	1,2,3,4,5,6
				Journal Writing	Assignments	25	—	
	(Term End Examination)	End Exam		End Of the Course	25	10	Practical Answer Sheets	1,2,3,4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form		1,2,3,4,5,6	
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Evaluation	15
2	Viva	05
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	—	3	1	1	2	—	2	—	—	2
2	—	3	2	2	3	—	—	—	—	2
3	—	3	3	2	—	—	1	—	—	—
4	—	3	2	2	1	—	—	—	—	—
5	—	3	2	2	—	—	—	—	—	—

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Author	Title,Publisher, Year of publication	ISBN Number
1	Wm.Arthur Conklin Dwayne Williams Gregory B. White RogerL.Davis Chuck Cothren,	Principles of computer security Security +and Beyond McGraw Hill Technology Education International Edition2005	—
2	Behrouz A Forouzan,De Anza Col- lege,Deepak Mukopadhay	Cryptography And Network Security McGraw Hill Technology Education International 2nd Edition	—

E-References:

1. https://en.wikipedia.org/wiki/Computer_security/
- 2.2. [https://en.wikipedia.org/wiki/C-list-\(computer-security/](https://en.wikipedia.org/wiki/C-list-(computer-security/)

Programme : Diploma in Computer Engineering/Information technology

Programme Code : 06/26/07

Name of Course : Software Testing

Course Code : CM486

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	02	32
Tutorial	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	10	40	50	–	50

Course Rationale:

Software testing will introduce you to basic of software testing, teaching you not just the fundamentals of teaching skills but also supporting skills necessary to become a successful software tester .You will learn how to immediately find problems in any computer program, how to plan an effective test approach, how to clearly report your finding, and to tell when your software is ready for release.

Course Outcomes:

Students should be able to

1. Prepare test plan and test cases for given application software product.
2. Test software for performance measures such as compatibility, usability.
3. Identify bugs to create defect report of given application software.
4. Select and Apply various software testing techniques.
5. Know various automated testing tools.

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : Basics of Software Testing		
1. Identify need of testing in software development. 2. Analyze the quality of Software.	1.1 Error and bug terminology, Testing terms, Test effort, The Fundamental Test Process 1.2 Test planning and control , Test analysis and design, Test implementation and execution , Evaluation of the test exit criteria and reporting 1.3 Test closure activities, General principles of testing 1.4 Requirement gathering and analysis, Planning, Design, Coding, Testing, Maintenance 1.5 Quality Assurance and Quality Control, Testing, Verification and Validation.	04
Unit 2: Types of Testing		
1. Generate test cases from software requirements using various test Processes for continuous quality improvement. 2. Apply software testing techniques for information systems development	2.1 White box testing : Static testing , Structural testing 2.2 Black box testing: Requirement based testing, Positive and Negative testing, Boundary value analysis, Decision tables, Equivalence partitioning, User documentation testing. 2.3 Integration testing: Top-Down and Bottom-Up integration, System integration, Scenario testing. 2.4 System and Acceptance testing: Functional system testing, Design/ Architecture testing, Deployment testing, Beta testing 2.5 Non-functional system testing: Configuration testing, Scalability and Reliability testing, Acceptance testing, Internationalization testing, Localization testing	08
Unit 3: Special Tests		
1. Test software for compatibility, usability and security issues. 2. Write test cases for given object oriented application	3.1 GUI testing: Compatibility testing,Security testing 3.2 Performance and Stress testing,Recovery and Installation testing 3.3 Smoke and Sanity testing: Regression testing, Usability testing. 3.4 Object oriented application testing: Client-Server testing, Web based testing.	04

Unit 4: Test Management		
1. Prepare test plan for given application. 2. Describe Test management process	4.1 Test Planning : Preparing a test plan, Scope management, Deciding test approach, Setting up criteria for testing, Identifying Responsibilities, Staffing, Training needs, Resource requirements, Test deliverables, Testing tasks. 4.2 Test Management: Choice of standards, Test infrastructure management, Test people management, Integrating with product release. 4.3 Test Process: Baselineing a test plan, Test case specification, Update of Traceability matrix, Executing test cases, Collecting and analyzing metrics, Preparing test summary report. 4.4 Test Reporting: Recommending product release.	06
Unit 5: Defect Management		
1. Find Defect using different technique. 2 Describe Defect Life cycle.	5.1 Introduction, Defect classification, Defect management process. 5.2 Defect life cycle, Defect template. 5.3 Estimate expected impact of a defect, Techniques for finding a defects, Reporting a defect.	04
Unit 6: Testing Tools and Measurements		
1. Discover how to improve testing efficiency by automating your test. 2. Test software using automated test tools.	6.1 Features of test tool: Guideline for selecting a tool . 6.2 Static and dynamic testing tool, Advantages and Disadvantages of using tools. 6.3 When to use Automated test tools, Testing using Automated tools. 6.4 What are metrics and measurement.: Types of Metrics, Project metrics, Progress and Productivity Metrics.	06
Total Hrs		32

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Tutorial Hrs.	Practical Hrs.
1	Introduction to Software Testing Concepts through writing test cases on any device.(Ex. Monitor, Keyboard, Mouse, Booting Failure)	Units 1 : Basics of Software Testing	06	02
2	Perform STLC (Documentation, Planning, testing, delivery) and Create a test plan for any software project.	Units 1 : Basics of Software Testing	06	02
3	Write Test Cases For any Application(e.g. Railway res. Form)	Units 1 : Basics of Software Testing	–	02
4	Write test cases for Web Pages Testing- Functional testing and Integration testing on any Web Sites.	Unit 2: Types of Testing	04	04
5	Write a program to demonstrate use of following and test it 1) For... Loop 2) Switch...case 3) Do... While 4) If...else And write test cases for white box testing on above program.	Unit 2: Types of Testing	02	06
6	Write test cases for Regression testing on any web page.	Unit 3: Special Tests	02	02
7	Write test cases for an Entry screen with at least 10 parameters.	Unit 4: Test Management	01	02
8	Write test cases for function calls.	Unit 4: Test Management	01	02
9	Case study on Defect Management.	Unit 5: Defect Management	06	02
10	Study any two different Automation Testing tools, which one is cost effective and open source. Study Quality standard ISO 9000:9001.	Unit 6: Testing Tools and Measurements	04	08
		Total Hrs	32	32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Basics of Software Testing	Classroom teaching
2	Types of Testing	Classroom teaching, laboratory demonstration
3	Special Tests	Classroom teaching
4	Test Management and planning	Class room teaching, laboratory work
5	Defect Management	Class room teaching, laboratory work
6	Testing Tools and Measurements	Class room teaching, laboratory work

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Basics of Software Testing	01	02	02	05
2	Types of Testing	03	02	04	09
3	Special Tests	02	01	03	06
4	Test Management and planning	02	02	04	08
5	Defect Management	02	01	02	05
6	Testing Tools and Measurements	02	01	04	07
	Total	12	09	19	40

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests will be computed)	10	–	Test Answer sheets	1,2,3
				Assignment	–		Assignment Book	1,2,3
				TOTAL	10	=		
	(Term End Examination)	End Exam		End Of the Course	40	14	Theory Answer sheets	1,2,3
Direct Assessment Practical	Continuous Assessment	ST	Students	One skill test at end of term	10	–	Practical Answer sheets	
				Journal Writing	15	–	Journal	4,5,6,
				TOTAL	50	20		
	(Term End Examination)	End Exam		End Of the Course	50	20	Practical Answer Sheets	4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3 4,5,6
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Evaluation	15
2	Practical Execution	15
3	Viva voce	20
	TOTAL	50

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	2	2	2	3	1	1	1	1	2	2
2	2	3	2	2	2	–	1	1	3	3
3	2	3	2	2	1	–	2	1	2	3
4	2	3	2	3	2	2	2	1	3	3
5	3	2	3	3	3	2	1	2	3	3
6	2	3	3	2	3	2	2	2	2	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Author	Title,Publisher, Year of publication	ISBN Number
1	Srinivasan Desikan Gopaldaswamy Ramesh	Software Testing: Principles and Practices, Pearson,2006	9788177581218
2	M G Limaye	Software Testing: Principles, Techniques and Tools , McGraw-Hill 2009	McGraw-Hill
3	John A. Estrella Maria C. Estrella	Sample Exam Questions ISTQB	SPD

E-References:

1. <http://www.softwaretestinghelp.com/>
2. <http://www.testingexcellence.com/>
3. <https://en.wikipedia.org/>
4. <http://www.defectmanagement.com/>

Programme : Diploma in Computer Engineering
Programme Code : 06/26
Name of Course : Relational Database Management System
Course Code : CM487

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Term Work/Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	03 Hrs.	–	–	–
Marks	20	80	25	–	25

Course Rationale:

The major objectives of this course are to provide a strong formal foundation in Database Concepts, technology and practice to the students to enhance them into well informed application developers. After learning this subject, the students will be able to understand the designing of RDBMS and can use any RDBMS package as a backend for developing database applications.

Course Outcomes:

Students should be able to

1. Draw Entity Relationship diagram.
2. Design database schema.
3. Normalize given database.
4. Create and process database for a given case study using relational database management engine.
5. Create index, sequence, and views in SQL for tuning the performance in case of data retrieval.
6. Write and execute PL/SQL procedures using triggers, cursors.

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Section I		
Units 1 : Introduction to Database system		
1. State importance of database management system. 2. Define data, database, DBMS, data independence, data abstraction, and schema. 3. State Codd's laws. 4. Describe architecture of DBMS. 5. Distinguish Hierarchical, networking and relational data model. 6. Describe data mining, data warehousing and big data.	1.1 Basic Database concepts: Data, database, Database system, DBMS, and Drawbacks of file system, Advantages of DBMS, Applications of DBMS, Database users and administrator, data abstraction, Data independence, schema, , The Codd's laws for fully functional RDBMS. 1.2 Architecture: Overall architecture of DBMS. 1.3 Data Models: Three classical Data Models Hierarchical, Networking, Relational Data Models. 1.4 Advanced database concepts: Data mining, Data Warehousing, Introduction to Big data.	08
Unit 2: Relational Data Model		
1. Define table, row, column, domain, attribute, key, strong entity set and weak entity set. 2. State types of keys and give example of each. 3. Describe data constraints. 4. Describe database design in terms of 1NF, 2NF and 3NF. 5. Describe conceptual design. 6. Draw an ER diagrams.	2.1 Relational Structure- Tables (Relations), Rows (Tuples), Domains, attributes Keys: Super Keys, Candidate Keys, Primary Keys, Foreign Keys. 2.3 Data Constraints: Referential Integrity Constraints: Primary key constraint, Unique, Check constraint. Entity Integrity Constraints. 2.4 Database Design: Relational database Design, Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF. 2.5 Conceptual Design: Entity Relationship Model, Strong Entity set, Weak Entity set, Types of Attributes, E-R Diagrams.	10
Unit 3: Interactive SQL		
1. Enlist oracle data types. 2. Compare DDL, DML, DCL and TCL. 3. Write SQL queries on DDL, DML, DCL and TCL. 4. Describe clauses and Joins with its types. 5. Write SQL queries to evaluate use of clauses and joins. 6. Enlist operators and compare between Relational, Arithmetic, Logical, set operators. 7. Write SQL queries to evaluate use of operators. 8. Enlist functions and compare Date, time, String functions and Aggregate Functions. 9. Write SQL queries to evaluate use of functions.	3.1 SQL: Invoking SQL*PLUS, The Oracle Data-types ,Data Definition Language (DDL), Data Manipulation language (DML), data control language (DCL), Transaction control language (TCL)Discharge-definition and its unit 3.2 Clauses Join: Different types of clauses in SQL. Joins, Types of Joins, Nested queries. 3.3 Operators: Relational, Arithmetic, Logical, set operators. 3.4 Functions: Date and time, String functions, Aggregate Functions.	12

Section II		
Unit 4: SQL Performance Tuning		
1. Define view, sequence and index. 2. Describe view with its types. 3. Write SQL queries to create view and perform different operations on it. 4. Write SQL queries to create sequence and perform different operations on it. 5. Describe types of indexes. 6. Write SQL queries to create index and perform different operations on it.	4.1 Creating Views, Views: Types of Views: Read Only View and Updatable Views, Dropping Views. 4.2 Sequences: Creating Sequences, Altering Sequences, Dropping Sequences 4.3 Indexes: Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes.	08
Unit 5: PL/SQL		
1. Define Exception and Cursors. 2. Enlist PL/SQL data types. 3. State advantages of PL/SQL. 4. Describe control structure with its types. 5. Write PL/SQL block to evaluate use of different control structures. 6. Describe exception handling with its types. 7. Write PL/SQL block to create different types of Exception. 8. Describe working of cursors. 9. Distinguish between Implicit and Explicit cursors. 10. Write PL/SQL block to create different types of cursors.	5.1 Introduction of PL/SQL: The PL/SQL Syntax, The PL/SQL Block Structure, Fundamentals of PL/SQL, Advantages of PL/SQL data Types. 5.2 Control Structure: Conditional Control, Iterative Control, Sequential Control. 5.3 Exception handling: Predefined Exception, User defined Exception. 5.4 Cursors: Implicit and Explicit Cursors, Declaring, Opening and Closing a Cursor, Fetching a Record from Cursor, Cursor for loops, Parameterized Cursors.	12
Unit 6: PL/SQL Database Objects and Database administration Overview		
1. Define Procedure, Function and Trigger. 2. State advantages of procedure. 3. Describe working of stored procedure. 4. Write PL/SQL block to create stored procedures. 5. Describe working of triggers. 6. Write PL/SQL block to create different types of triggers. 7. Describe roles and responsibilities of database administrator. 8. Describe procedure to take database backup.	6.1 Procedures: Advantages, Creating, Executing and Deleting a Stored Procedure 6.2 Functions: Advantages, Creating, Executing and Deleting a Function. 6.3 Database Triggers: Use of Database Triggers, Types of Triggers, Syntax for Creating Trigger, Deleting Trigger. 6.4 Introduction to database administration: Creating and deleting users, Assigning privileges to users, Managing Tablespace and Datafiles , Backup database.	14
Total Hrs		64

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Practical Hrs.
1	Creating a Table, Inserting Data into Tables, Updating Contents of a Table, Delete Operations, Modifying the Structure of the Table, Renaming the table, Dropping Tables.	Relational Data Model	02
2	Applying Constraints such as Referential Integrity and Entity Integrity constraints.	Interactive SQL	02
3	Writing Queries using various types of operators and Functions	Interactive SQL	02
4	Writing Queries using different types of clauses.	Interactive SQL	02
5	Writing Queries using different types of Joins.	Interactive SQL	02
6	Working with Views.	SQL Performance Tuning	02
7	Working with Sequence and Indexes	SQL Performance Tuning	02
8	Write the basic PL/SQL Program.	PL/SQL	02
9	Write the PL/SQL Program using different Control structures.	PL/SQL	02
10	Write a program to implement cursors.	PL/SQL	02
11	Programs based on Exceptions handling. (Predefined and user defined exceptions)	PL/SQL	02
12	Write different Stored Procedures.	PL/SQL Database Objects and Database administration Overview	02
13	Write program to implement Functions.	PL/SQL Database Objects and Database administration Overview	02
14	Write program for creating Various types Triggers.	PL/SQL Database Objects and Database administration Overview	02
15	Creating and deleting users and assign privileges to users.	PL/SQL Database Objects and Database administration Overview	02
16	Study of MongoDB, CouchDB, and Related Free Certifications	PL/SQL Database Objects and Database administration Overview	02
	Mini project: Design mini project using all database commands and Normalization technique.		
		Total Hrs	32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Introduction to Database system	Classroom teaching
2	Relational Data Model	Classroom teaching, laboratory demonstration
3	Interactive SQL	Classroom teaching, laboratory demonstration
4	SQL Performance Tuning	Class room teaching, laboratory demonstration
5	PL/SQL	Class room teaching, laboratory demonstration
6	PL/SQL Database Objects and Database administration Overview	Class room teaching, laboratory demonstration

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Database system	06	06	00	12
2	Relational Data Model	04	04	06	14
3	Interactive SQL	04	04	06	14
4	SQL Performance Tuning	02	04	04	10
5	PL/SQL	04	04	06	14
6	PL/SQL Database Objects and Database administration Overview	04	06	06	16
Total		24	28	28	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests will be computed)	20	10	Test Answer sheets	1,2,3
				Assignment	–	–	Assignment Book	1,2,3
	TOTAL			20	10			
	(Term End Examination)	End Exam		End Of the Course	80	28	Theory Answer sheets	1,2,3
Direct Assessment Practical	Continuous Assessment	–	Students	–	–	–	–	
		Journal Writing		Assignments	25	–	Journal	4,5,6,
	TOTAL			25	10			
	(Term End Examination)	End Exam		End Of the Course	25	10	Practical Answer Sheets	4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3 4,5,6
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Observations and Writing	05
2	Execution and Result	15
3	Viva voce	05
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	3	3	2	2						
2	3	3	2	2						
3	3	3	1	-						
4	3	3	3	3						
5	3	3	3	3						
6	3	3	3	3						

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Title	Author, Publisher, Year of publication	ISBN Number
1	Introduction to Database system	Abraham Silberschtz, Henry Korth and S.Sudharshan, Tata McGraw Hill , 3rd edition ,	13-978-93-3290-138-4
2	Relational Data Model	Abraham Silberschtz, Henry Korth and S.Sudharshan, Tata McGraw Hill , 3rd edition ,	13-978-93-3290-138-4
3	Interactive SQL	Ivan Bayross, BPB Publication, 3rd edition ,	10:81-7656-964-X
4	SQL Performance Tuning	Ivan Bayross, BPB Publication, 3rd edition ,	10:81-7656-964-X
5	PL/SQL	Ivan Bayross, BPB Publication, 3rd edition ,	10:81-7656-964-X
6	PL/SQL Database Objects and Database administration Overview,	Kevin Lonely, Tata McGraw Hill,	

E-References:

1. <https://www.w3schools.com/sql>
2. <https://www.tutorialspoint.com/sql>
3. <https://www.studytonight.com/dbms>