CENTURION UNIVERSITY OF TECNOLOGY AND MANAGEMENT, ODISHA
TEACHING AND EVALUATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES

DISCIPLINE: INFORMATION TECHNOLOGY						SEMESTER: 5TH						
SL NO	SUBJECT CODE	SUBJECT	PERIODS			EVALUATION SCHEME						
			L	T	P	INTERNAL EXAM			END SEM EXAM	TERM WORK	PRACTIC AL EXA	TOTAL MARKS
						TA	CT	Total				
THEORY												
1.	DICG5101	Computer Graphics & Multimedia	4	1	0	10	20	30	70			100
2.	DISE5102	Software Engineering	4			10	20	30	70			100
3.	DICN5103	Computer Network & Data Communication	4			10	20	30	70			100
4.	DIDM5104	Database Management System	4			10	20	30	70			100
5.	DIMC5105	Mobile Computing	4			10	20	30	70			100
PRACTICAL/TERM WORK												
6.	DIGM5201	Graphics & Multimedia Lab			6					50	50	100
7.	DIDB5202	DBMS Lab			6					25	50	75
8	DIFE5203	Front End Tools Lab			6					25	50	75
GRAND TOTAL			**20**	1	**18**	**50**	**100**	**150**	**350**	**75**	**175**	**750**

Total Contact hours per week: 39
Abbreviations: L-Lecture, T-Tutorial, P-Practical, TA- Teacher's Assessment, CT- Class test
Minimum Pass Mark in each Theory Subject is 35% and in Practical subject is 50%

Computer Graphics & Multimedia
DICG5101

L	T	P		
4	1	-	Total Mark	: 100
			Theory	: 70
			Class Test	: 20
			Teacher's Assessment	: 10

RATIONALE

Graphics and Multimedia-now a day probably the most talked about technology in the field of computer. This technology is nowadays largely adopted by most computer based applications to bridge the gap between a human user & the computer. By this , multiple media are implemented and used in computer based application to enhance their understanding ability before a common man. This multiple media include, text, sound, video, graphics animation etc. This paper will expense the students to the various concepts of these media and their implementation in computer based application. This will also expose the students to various multimedia implementation techniques like data compression, & various multimedia standards.

Course Content **Periods**

1. Applications of Computer Graphics & Multimedia **02**

1.1 Computer graphics in CAD
1.2 Presentation Graphics
1.3 Computer Art
1.4 Entertainment
1.5 Education & Training
1.6 Visualization
1.7 Image Processing
1.8 Graphic User Interface
1.9 Multimedia Concepts.

2. Overview of Graphics System **05**

2.1 Graphics System
2.2 Raster Scan Display
2.3 Random Scan Display
2.4 Graphics Input Devices
2.5 Graphics Software.

3. Graphics Output primitive **05**

3.1 Points & Lines
3.2 DDA Line Drawing Algorithm
3.3 Bresenham's Line drawing Algorithm
3.4 Mid Point Circle algorithm
3.5 Filled Area Primitives
3.6 Boundary fill algorithm, Flood fill algorithm

4. Two Dimensional Geometric Transformations 03

4.1 Translation
4.2 Rotation
4.3 Scaling
4.4 Reflection
4.5 Shear
4.6 Matrix representation and Homogenous coordinate system
4.7 Composite transformation

5. Two Dimensional Viewing 04

5.1 Viewing pipeline
5.2 Viewing coordinate reference frame
5.3 Window to view port coordinate transformation
5.4 Line clipping concept
5.5 Polygon clipping concept.

6. Three Dimensional Object Representations 10

6.1 Polygon surface
6.2 Polygon table
6.3 Plane equation
6.4 Polygon mesh
6.5 Quadric surfaces
6.6 Sphere, Ellipsoid
6.7 Spline representation
6.8 Bezier curves & Surfaces
6.9 B-Spline curves & surfaces.

7. Three Dimensional Geometric & Modeling Transformations 04

7.1 Translation
7.2 Rotation
7.3 Scaling
7.4 Reflection
7.5 Shear
7.6 Composite transformation
7.7 Modeling & Coordinate transformation.

8. Three Dimensional Viewing 06

8.1 Viewing pipeline
8.2 Viewing coordinates
8.3 Parallel projection
8.4 Perspective projection
8.5 Concept of 3D clipping.

9. Illumination Model & Surface Rendering Methods 04

9.1 Different light sources used in 3D modeling
9.2 Basic Illumination model
9.3 Ambient light
9.4 Diffuse reflection
9.5 Specular reflection,

10. Introduction to Digital Audio 06

10.1 Basics of Acoustics, Psychoacoustics
10.2 Musical sound and noise, elementary sound system
10.3 Microphones, Amplifiers, digital audio formats
10.4 Audio compression (LPC, Sub Band Encoding)

11. Introduction to Digital Image 06

11.1 Vector and raster Graphics
11.2 Digital representation of image, colour, 16 bit, 24 bit colour depth
11.3 Colour Characteristics-Hue, saturation, Luminance
11.4 Colour Palette

11.5 Image formats-JPEG, BMP, TIFF, GIFF
11.6 Image evaluation
11.7Layers
11.8 Filters
11.9 Image manipulation-scaling, cropping, rotation

12. Introduction to Video **05**

12.1Video in Multimedia
12.2 Basics of Motion-Video
12.3 Sources of Motion-Video
12.4 Video formats, lines, frames, fields
12.5 TV Broadcast standards-PAL, NTSC, SECAM
12.6 MPEG Compression

Text Book :

1. Computer Graphics ; Donald Hearn , M.Pauline Baker ; PHI
2. Multimedia Systems; Buford; Pearson
3. Multimedia: Sound and Video by Jose Lozano, PHI
4. Multimedia Systems,Tech. & Communications; S.Pandey, M.Pandey; Katson

Software Engineering

DISE5102

L	T	P		
4	-	-	Total Mark	: 100
			Theory	: 70
			Class Test	: 20
			Teacher's Assessment	: 10

RATIONALE

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

Course Content **Periods**

1.0 Introduction to software engineering **06**

1.1 Relevance of software engineering
1.2 Software characteristics and applications
1.3 Emergence of software engineering.
1.4 Early computer programming high level language programming control flow based design data flow oriented design data structure oriented design object and component bases design
1.5 Software life cycle models
1.6 Classical water fall and iterative water fall models
1.7 Prototyping
1.8 Evolutionary model
1.9 Spiral model

2.0 Understanding project management **06**

2.1 Project management concepts people, product, process and project
2.2 Project management
2.3 Project size estimation metrics line of control (LDC) and function point metric (FP)
2.4 Difference between the project estimation techniques empirical estimation techniques, heuristic techniques, analytical estimation techniques
2.5 COCOMO models, Basic, Intermediate and complete
2.6 Effect of schedule change on lost
2.7 Jensen model for stating level estimation
2.8 Tools for scheduling
2.9 Use of work breakdown structure, activity networks, Gantt chart and PERT in scheduling
2.10 Organization structure
2.11 Team structure
2.12 Importance of risk identification risk assessment and risk containment with reference to risk management

3.0 Understanding the need of requirement Analysis **06**

3.1 Need for requirement analysis
3.1 Steps in requirement dictation for software- initiating the process facilitated application specific techniques and quality function deployment
1.2 Principles of analysis
1.3 Software prototyping
1.4 Prototyping approach
1.5 Prototyping tools and methods
1.6 S/W requirement specification principle
1.7 SRS document
1.8 Characteristics and organization of SRS document

4.0 Understanding the principles and methods of S/W design 08

4.1 Importance of S/W design
4.2 Design principles and concepts
4.3 Cohesion and coupling
4.4 Classification of cohesiveness
4.5 Classification of coupling
4.6 S/W design approaches
4.7 Structured analysis methodology
4.8 Use of DF diagrams
4.9 List the symbols used in DFD
4.10 Construction of DFD
4.11 Limitations of DFD
4.12 Uses of structure of chart and structured design
4.13 Principles of transformation of DFD to structure chart
4.14 Transform analysis and transaction analysis
4.15 Object oriented concepts
4.16 Object oriented and function oriented design

5.0 Understanding the principles of user interface design 08

5.1 Rules for UID
5.2 Interface design models
5.3 UID Process and models
5.4 Interface design activities defining interface objects, actions and the design issues
a. Compare the various types of interface
b. Main aspects of Graphical UI, Text based interface

6.0 Understanding the principles of S/W coding 10

6.1 Coding standards and guidelines
6.2 Code walk through
6.3 Code inspections and software documentation
6.4 Distinguish between unit testing integration testing and system testing
6.5 Unit testing
6.6 Methods of black box testing
6.7 Equivalence class partitioning and boundary value analysis
6.8 Methodologies for white box testing
6.9 Different white box methodologies statement coverage branch coverage, condition coverage, path coverage, data flow based testing and mutation testing
6.10 Debugging approaches
6.11 Debugging guidelines
6.12 Need for integration testing
6.13 Compare phased and incremental integration testing
6.14 System testing alphas beta and acceptance testing
6.15 Need for stress testing and error seeding
6.16 General issues associated with testing

7.0 Understanding the importance of s/w reliability 08

7.1 Importance of S/W reliability
7.2 Distinguish between the different reliability metrics
7.3 Reliability growth modeling
7.4 Characteristics of quality software
7.5 Evolution of s/w quality management system
7.6 Importance, requirement and procedure to gain ISO 9000 certification for software industry
7.7 SEI capability maturity model
7.8 Compare between ISO 9000 certification

8.0 Understanding the computer aided software engineering 08

8.1 Briefly explain CASE benefits of CASE
8.2 Briefly explain the building blocks for CASE
8.3 CASE support in S/w life cycle
8.4 List the different CASE tools

BOOKS

1. Fundamentals of software engineering - Rajib Mall. Prentice hall of India
2. Software engineering a practitioners approach - Roger S. Pressman., M.C Grawhill international
3. Software Engineering; Firewall
4. Software Engineering ; A Primer , Jawadekar : TMH

Computer Network & Data Communication
DICN5103

L	T	P		
4	-	-	Total Mark	: 100
			Theory	: 70
			Class Test	: 20
			Teacher's Assessment	: 10

RATIONALE

Computer Network & Data Communication is the prime area of Application Development. Business applications need to store J_ process large volume of data. This paper teaches the methodology of storing & processing da for commercial application. It also deals in the security & other aspects of DBMS.

1.0 BASIC of Data Communication **02**
1.1 Introduction to Data Transfer
1.2 Asynchronous & Synchronous Transmission

2.0 Reliable Data Transmission **04**
2.1 Data Transfer rate, channel capacity
2.2 Packet Switchining
2.3 Datagrams and virtual circuits
2.5 Different methods of Error Detection, Error Recovery or Error Correction, Flow Control

3.0 Connections and Interfacing **06**
3.1 Introduction to Serial and parallel connections
3.2 Half Duplex, Full Duplex, Parallel connection
3.3 RJ-45, Modular Connection Modem

4.0 Multiplexing **08**
4.1 Concept of Multiplexing
4.2 Various types of Multiplexing (TDM,FDM,SDM,CDM)

5.0 Network Applications **06**
5.1 Introduction, Network users, Central Servers
5.2 LAN Environment, Device Sharing, Print servers
5.3 Directory Services, Network benefits, Network Disadvantages

6.0 Network Structures **04**
6.1 Topologies
6.2 Structured Wiring System, Media Twisted Pair, Coaxial cable, Fiber Optics

7.0 Standards **10**
7.1 Introduction to OSI reference Model, seven layer model, Physical Layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer
7.2 Advantage of Layering & Existing Standards,

8.0 LAN Signaling and Access **08**
8.1 Signaling Base band,
8.2 Manchester encoding & differential Manchester Encoding

8.3 Modulation techniques: Phase Modulation
8.4 Broadband and carrier band.
8.5 Access: Carrier sense Multiple Access (CSMA), P-persistent CSMA,CSMA/CD (Collision Detection), CSMA /CA (Collision Avoidance)
8.6 Token passing, Token Ring, Token Bus, Slotted Ring, Demand Priority, Fast Switching.

9.0 Popular LAN Standards 04

9.1 Different LAN standards: IEEE 802.3, 10base5, 10base2, 10baseT, Switched Ethernet, IEEE802.4, IEEE 802.5, Token Structure, IEEE 802.6, IEEE 802.1, Physical Layout, Data Encoding and Transmission, FDDI,ATM

10.0 Interconnection 04

10.1 Use of Repeaters, Bridges, Router, Gateways, Public Network, X.25, Frame Relay

11.0 Iteroperability 04

TCP/IP protocol suite

BOOKS:

1. Data Communication & Computer Networks by W.Stallings (PHI),
2. Introduction to Comp. Network; M.Bhatia; Unv. S. Press
3. Computer networks; Tanenbum; Pearson
4. Data communication & network; Forouzen; TMH

Database Management System
DIDM5104

L	T	P		
4	-	-	Total Mark	: 100
			Theory	: 70
			Class Test	: 20
			Teacher's Assessment	: 10

RATIONALE

Database is the prime area of Application Development. Business applications need to store J_ process large volume of data. This paper teaches the methodology of storing & processing da for commercial application. It also deals in the security & other aspects of DBMS.

1.0 BASIC CONCPETS OF DBMS

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

2.0 DATA MODELS

2.1 Data independence
2.2 Entity relationship models
2.3 Entity sets and Relationship sets 2.4 Explain Attributes
2.5 Mapping constraints
2.6 E-R Diagram
2.7 Relational model
2.8 Hierarchical model
2.9 Network model

3.0 RELATIONAL DATABASE

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

4.0 NORMALIZATION IN RELATIONAL SYSTEM

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

5.0 STRUCTURED QUERY LANGUAGE

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

6.0 TRANSACTION PROCESSING CONCEPTS

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

7.0 CONCURRENCY CONTROL CONCEPTS

7.1 Basic concepts,
7.2 Locks, Live Lock, Dead Lock,
7.3 Serializability(only fundamentals)

8.0 SECURITY AND INTEGRITY

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

BOOKS:

1. An Introduction to Database Systems By:- C.J. Date
2. DATABASE System Concepts A. Silberschatz, H.F. Korth,
3. The Database book, principles & practices, Unv. SC. Press
4. Database System concepts; Rog,Cornel; Cengage Learning
5. Data Base System ; B. Desai; Galgotia Publication

Mobile Computing
DIMC5105

L	T	P
4	0	0

Total Mark : 100
Theory : 70
Class Test. : 20
Teacher's Assessment: 10

RATIONALE

Mobile Computing is the basic foundation paper for any hardcore computer engineer. In this subject students will be exposed to the theoretical aspects of different functional units of a digital computer and fundamental idea how different units of a computer system work together to achieve a common goal.

COURSE CONTENT **PERIODS**

1. Introduction to Wireless networks & Mobile Computing **04**
1.1 Networks
1.2 Wireless Networks
1.3 Mobile Computing
1.4 Mobile Computing Characteristics
1.5 Application of Mobile Computing

2. Introduction to Mobile Development Frameworks **06**
2.1 C/S architecture
2.2 n-tier architecture
2.3 n-tier architecture and www
2.4 Peer-to Peer architecture
2.5 Mobile agent architecture

3. Wireless Transmission **06**
3.1 Introduction
3.2 Signals
3.3 Period, Frequency and Bandwidth.
3.4 Antennas
3.5 Signal Propagation
3.6 Multiplexing
3.7 Modulation
3.8 Spread Spectrum
3.9 Cellular System

4. Medium Access Control **06**
4.1 Introduction
4.2 Hidden/ Exposed Terminals
4.3 The basic Access Method
4.4 Near / Far Terminals
4.5 SDMA, FDMA,TDMA, CDMA

5. Wireless LANs **06**
5.1 Wireless LAN and communication
5.2 Infrared

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

6. Ubiquitous Wireless Communication **06**
6.1 Introduction
6.2 Scenario of Mobile Communication
6.3 Mobile Communication Generations 1G to 3G
6.4 3rd Generation Mobile Communication Network
6.5 Universal Mobile telecommunication System (UMTS)

7. Mobile IP **06**
7.1 Overview
7.2 Working with mobile IP
7.3 Mobile IP Entities
7.4 Mobility Agents
7.5 Components of Mobile IP
7.6 Mobile IPv6 Features
7.7 Mobile IPv6 Address Types
7.8 Mobile IPv6 Address Scope
7.9 Mobile IP Operation

8. Mobile Transport Layer **04**
8.1 Traditional TCP and implications on mobility
8.2 Indirect TCP
8.3 Snooping TCP
8.4 Mobile TCP
8.5 Selective Retransmission
8.6 Transaction oriented TCP

9. Mobile Computing **04**
9.1 WWW architecture for Mobile computing
9.2 Need of WAP
9.3 Benefits of WAP
9.4 Examples of WAP
9.5 WAP- Architecture
9.6 WAP protocols
9.7 WML
9.8 WAP Push architecture
9.9 Push-Pull based data acquisition
9.10 I-mode
9.11 WAP 2.x

10. Wireless Telecomm Networks **04**

10.1 GSM
10.2 GPRS
10.3 IS-95
10.4 CDMA-2000
10.5 W-CDMA
10.6 Wireless Sensor Networks

11. Messaging Services **04**

11.1 Short Message Services (SMS)
11.2 Multimedia Message Services (MMS)
11.3 Multimedia transmission over wireless

12. Pervasive Computing and Information Access **04**

12.1 Introduction
12.2 Pervasive Computing History
12.3 Pervasive Computing Technology
12.4 Pervasive Computing Characteristics
12.5 Application Framework
12.6 Issues

Books

1. Mobile Computing ; By : Dr. N.NJani, Kamaljit I. Lakhtaria, Dr. Ashish N. Jani & Nita Kanabar (S.Chand & Company Ltd.)

Graphics & Multimedia Lab
DIGM5201

L	T	P
0	0	6

Practical : 50
Sessional : 50

1.0 Implementing DDA, Bresenham Line generation algorithm.

2.0 Implementing midpoint circle generation algorithm.

3.0 Implementing area fill algorithm.

4.0 Working with Sound Forge

5.0 Working with Photoshop

6.0 Working with Adobe Premier

7.0 Working with Authoring tool (Author ware professional / Tool book Instructor)

8.0 Working with Flash

Data Base Management System Lab
DIDB5202

L	T	P
0	0	6

Practical : 50
Sessional : 25

1. **INTORODUCTION IN ORACLE**
   Organization of Data, Accessing Data , Core Package, DBMS Tools

2. **WORKING WITH SQL**
   SQL Operators , Rules of SQL, Creating Table, inserting into Table, Altering , Updating Table, Query using SELECT Clause, Use of HAVING, GROUP BY, ANY, ALL, SOME etc.

3. **VIEWS, INDEX, SYNONYMS**
   Creating VIEW, using , Updating, Altering View, Creating and Dropping Index, Synonyms for Table and View

4. **USING PL/SQL BLOCKS IN SQL**
   The PL/SQL execution environment, the PL /SQL syntax, Data type, understanding the PL/SQL block structure, Error handling in PL/SQL

5. **WORKING WITH SQL *REPORT WRITER**
   Getting started, Selecting dump report, control break report

6. Design & Develop a small business system (Ex: Billing system / Payroll system / Credit card settlement etc.)

Front End Tools Lab.
DIFE5203

L	T	P
0	0	6

Practical : 50
Sessional : 25

1. Introduction
1.1 Start & Exit Visual Basic, Elementary idea on Objects
1.2 Visual basic Interface
1.3 Debug Windows
1.4 Print Command
1.5 Visual Basic Arithmetic Operator

2. Variables And Functions
2.1 Variable Names
2.2 Variable Type
2.3 Range of Variable values
2.4 Functions

3. Build Project & Customize Form
3.1 About Project
3.2 Form
3.3 Form events.

4. Visual Basic Control
4.1 Custom Control
4.2 Control in Form

5. Function & Procedures
5.1 About functions & Procedures
5.2 Form, Standards & Class Modules
5.3 Sub Procedures
5.4 Do-event function
5.5 Control Arrays

6. Accessing a Database
6.1 About Database
6.2 Using Data Manager
6.3 Creating a Database
6.4 Creating a new table
6.5 Attaching a table
6.6 Changing Design of existing Table
6.7 Creating Indexes
6.8 Working with Data

7. Create Form with Data Control
7.1 Data aware Control
7.2 Create a Form using Data Control
7.3 Manipulating Data
7.4 Create Menu Bar
7.5 Display Menu Item Code

8. Object Linking and Embedding
8.1 About OLE
8.2 Terms in OLE

8.3 OLE Automation
8.4 OLE Control pop menus
8.5 Create OLE object at design time
8.6 Create part of an OLE object
8.7 testing Embedding/ linking

9. Visual Software Development
9.1 RAD Tools
9.2 Visual Components
9.3 Basic Interface
9.4 Creating and Linking Object through Basic Programming
9.5 Activity

10. Advanced Features of Visual Basic
10.1 Visual Basic Controls
10.2 Simple Animation using Active X
10.3 Drag & Drop
10.4 Linking to Database

11. Active X and Windows API
11.1 Creating Active X DLL
11.2 Using Windows API in VB