KONGU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

ERODE – 638 107

PROGRAM NAME
B.Sc. (Computer Technology)

KONGU ARTS AND SCIENCE COLLEGE

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2019-2020

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SYLLABUS

Sem	Course Code	Core 9: Database Systems	Total Marks : 100		Hours Per Week	Credits
V	17UALCT501		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to have a strong foundation of database concepts and develop the skills for the design and implementation of a database application.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of database systems and their architectures.

CO2 Illustrate the concept of relational algebra, calculus and relational query language.

CO3 Summarize the concepts of Entity Relationship Model and Enhanced Entity Relationship Model.

CO4 Apply the Functional Dependency, Decomposition and Normalization.

CO5 Describe the Database Recovery and Database Security.

UNIT - I

Introduction to Database Systems: Introduction - Basic Concepts and Definitions - Data Dictionary - Database - Database System - Data Administrator (DA) - Database Administrator (DBA) - File-oriented System versus Database System - Historical Perspective of Database Systems - Database Language - Transaction Management - **Database System Architecture:** Schemas, sub-schemas, and Instances - Three-level ANSI-SPARC Database Architecture - Data Independence - Mappings - Structure, Components, and Functions of DBMS - Data Models - Types of Database Systems.

UNIT - II

The Relational Algebra and Calculus: Introduction - Historical Perspective of Relational Model - Structure of Relational Database - Relational Algebra - Relational Calculus - **Relational Query Languages:** Introduction - Codd's Rules - Structured Query Language (SQL) - Embedded Structured Query Language (SQL).

UNIT - III

Entity-Relationship (ER) Model: Introduction - Basic E-R Concepts - Conversion of E-R Model into Relations - Problems with E-R Models - E-R Diagram Symbols -
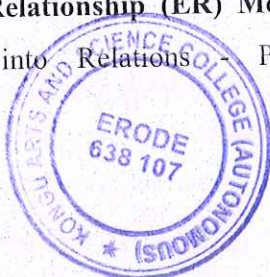
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Enhanced Entity - Relationship (EER) Model: Introduction - Subclasses, Subclass Entity Types and Super-classes - Specialisation and Generalisation - Categorisation.

UNIT - IV

Functional Dependency and Decomposition: Functional Dependency - Decomposition - **Normalization:** Introduction - Normalization - Normal Forms - Boyce-Codd Normal Forms (BCNF) - Multi-valued Dependencies and Fourth Normal Forms (4NF) - Join Dependencies and Fifth Normal Forms (5NF).

UNIT - V

Transaction Processing and Concurrency Control: Introduction - Transaction Concepts - Concurrency Control - **Database Recovery System:** Introduction - Database Recovery Concepts - Types of Database Failures - Types of Database Recovery - Recovery Techniques - **Database Security:** Introduction - Goals of Database Security - Discretionary Access Control - Mandatory Access Control.
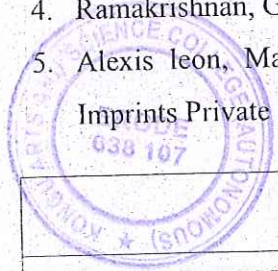
TEXTBOOK:

Shio Kumar Singh, Database Systems Concepts, Designs and Application, Second Edition, Pearson, First Impression, 2011.

BOOKS FOR REFERENCE:

1. Abraham Silberschatz, Henry F.Korth, Sudarshan, Database System Concepts, 5th Edition, McGraw-Hill International Edition, 2006.

2. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education, New Delhi, 2008.

3. Rajesh Narang, Database Management Systems, 2nd Edition, Eastern Economy Edition, 2011.

4. Ramakrishnan, Gehrke, Database Management Systems, 3rd Edition, McGraw-Hill, 2003.

5. Alexis leon, Mathews leon, Essentials of Database Management Systems, Vijay Nicole Imprints Private Limited, 2006.

QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

Sem	Course Code	Elective - I - C : Client / Server Computing	Total Marks: 100		Hours Per Week	Credits
V	17UALET507		CIA: 25	ESE: 75	5	4

OBJECTIVE:

To enable the students to learn the Client/Server application development and environment.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of the basic concepts and evolution of client/server computing.

CO2 Define the various client/server applications in client/server computing.

CO3 Describe the client hardware, software and client requirements.

CO4 Illustrate the knowledge of server and server environment.

CO5 Implement the concepts of server operating systems and server requirements.

UNIT - I

Introduction to Client/Server Computing: Overview of Client/Server Computing - What is Client/Server Computing? - Benefits of Client/Server Computing - **Evolution of Client/Server Computing:** Hardware Trends - Software Trends - Evolution of Operating Systems - Networking Trends - Business Considerations.

UNIT - II

Overview of Client/Server Applications: Components of Client/Server Applications - Classes of Client/Server Applications - Categories of Client/Server Applications - **Understanding Client/Server Computing:** Dispelling the Myths - Obstacles-Upfront and Hidden - Open Systems and Standards - Standards-Setting Organizations - Factors of Success.

UNIT - III

The Client Hardware and Software: Client Components - Client Operating Systems - What is a GUI? - Database Access - **Client Software Products:** GUI Environments - Converting 3270/5250 Screens - Database Access Tools - **Client Requirements:** GUI Design Standards - Open GUI Standards - Interface Independence - Testing Interfaces.

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UNIT - IV

The Server: Categories of Servers - Features of Server Machines - Classes of Server Machines - Server Environment: Network Management Environment - Network Computing Environment - Extensions - Network Operating System - Loadable Modules.

UNIT - V

Server Operating Systems: OS/2 2.0 - Windows New Technology - Unix Based Operating System - **Server Requirements:** Platform Independence - Transaction Processing - Connectivity - Intelligent Database - Stored Procedure - Triggers - Load Leveling - Optimizer - Testing and Diagnostic Tools - Backup and Recovery Mechanisms.
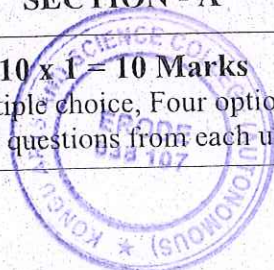
TEXTBOOK:

Dawna Travis Dewire, Client/Server Computing, Tata McGraw-Hill Edition, Tenth Reprint 2008.

BOOKS FOR REFERENCE:

1. Patrick Smith, Steve Guengerich, Client/Server Computing, Second Edition, Prentice Hall of India, New Delhi, 2002.
2. Robert Orfali, Dan Harkey and Jeri Edwards, Client/Server Survival Guide, Third Edition, Wiley Computer Publishing, 2007.
3. Jeri Edwards, Three Tier Client Server at Work, John Wiley and Sons, Singapore, 2003.
4. Larry T Vaughn, Client/Server System Design and Implementation, International Edition, McGraw-Hill, 2008.
5. Eric J Johnson, A Complete guide to Client/Server Computing, First Edition, Prentice Hall of India, New Delhi.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

Sem	Course Code	Advanced Learners Course 2 - A: Programming in C#	Total Marks : 100		Hours Per Week	Credits
V	17UALAL509		CIA : -	ESE: 100	-	2

OBJECTIVE:

To enable the students to learn the basic C# programming concepts.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Illustrate the basic concepts of C# programming.

CO2 Apply the concept of branching, looping, methods and arrays in C# programming.

CO3 Outline the importance of class, objects and inheritance.

CO4 Define the fundamentals of console I/O operations and exception mechanism.

CO5 Demonstrate the windows and web-based application development.

UNIT - I

Introduction: What is C#? - Evolution of C# - Characteristics of C# - Applications of C# - C# differ from C++ and Java - The C# Environment - **Overview of C#:** Introduction - Simple C# program - Namespaces - Adding Commands - Command Line Arguments - Using Mathematical Functions - Compile Time Errors - Program Structure - **Literals, Variables and Data Types:** Introduction - Literals - Variables - Data Types - Reference Types - Declaration and Initialization of Variables - Default Values - Constant and Scope of Variables - Boxing and Unboxing.

UNIT - II

Decision Making and Branching: Simple if statement - if....else - Nesting of if... else Statements - else if Ladder - Switch Statement - ?: Operator - **Decision Making and Looping:** while statement - do Statement - for and foreach statement - Jumps in Loop - **Methods in C#:** Declaring Methods - Main Method - Invoking Methods - Pass by Value - Pass by Reference - Methods Overloading - **Arrays:** Introduction - One-Dimensional Arrays - Creating an Array - Two-Dimensional Arrays - Variable-size Arrays.

UNIT - III

Class and Objects, Inheritance: Introduction - Basic Principles of OOP - Defining a Class - Adding Variables and Methods - Creating Objects - Accessing Class Members - Constructors - Copy Constructors - Destructors - Inheritance and Polymorphism - Interfaces - Operator Overloading - Delegates and Events.

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UNIT - IV

Console I/O Operations and Exceptions: Introduction - Console Class - Console Input and Output - Formatted Output - **Managing Errors and Exceptions:** Types of Errors - Exceptions - Syntax of Exception Handling Code - Multiple Catch Statement - Exception Hierarchy - Using Finally Statement - Nested Try Blocks - Throwing Our Own Exceptions - **Multithreading in C#:** Creating and Starting a Thread - Scheduling a Thread - Synchronising Threads - Thread Pooling.

UNIT - V

Windows and Web-Based Application Development: Introduction - Understanding Microsoft Visual Studio - Creating and Running a WinApp Windows Application - Creating and Running a WinApp2 Windows Application - Web-based Application on .NET.

TEXTBOOK:

E.Balagurusamy, Programming in C# - A Primer, Second Edition, Tata McGraw Hill Publishing Company Limited, 2008.

BOOKS FOR REFERENCE:

1. Herbert Schildt, C# 2.0 - The Complete Reference, Second Edition, Tata McGraw Hill Publishing Company Limited, Seventh reprint 2008.
2. B.Rama Krishna Rao, Programming with C#-Concept and Practice, Prentice Hall of India, New Delhi, 2007.
3. Matt Telles, C# Programming- Black Book, Dreamtech Press, 2004.
4. Jesse Liberty, Learning C#, O' Reilly, First Edition, 2008.
5. Jon Skeet, C# in Depth, Dreamtech Press, 2008.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 2 = 20 Marks 10 questions out of 12	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 15 = 45 Marks** (Answer any three questions) One question from each unit
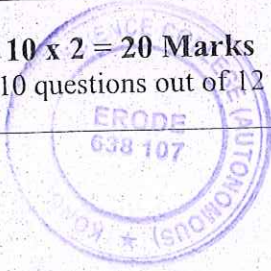
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Sem	Course Code	Core Lab 6: Android Programming Lab	Total Marks: 100		Hours Per Week	Credits
VI	17UALCP602		CIA: 40	ESE: 60	5	4

OBJECTIVE:

To enable the students to learn about creating Android Applications.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Install and configure Android application development tools.

CO2 Apply essential Android Programming concepts.

CO3 Develop an application using basic graphical primitives and databases.

CO4 Design user Interfaces for the Android platform.

CO5 Apply Java programming concepts for Android application development.

1. Develop an application that uses GUI components, Font and Colors.

2. Develop an application that uses Layout Managers and event listeners.

3. Develop a calculator application.

4. Write an application that draws basic graphical primitives on the screen.

5. Develop an application that makes use of database.

6. Develop an application that makes use of RSS Feed.

7. Implement an application that implements Multi threading.

8. Implement an application that writes data to the SD card.

9. Implement an application that creates an alert upon receiving a message.

10. Write a mobile application that creates alarm clock.

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Sem	Course Code	Elective - II - A: Computer Graphics	Total Marks : 100		Hours Per Week	Credits
VI	17UALET603		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the graphics concepts and methodologies.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Apply the various line drawing algorithms to scan and convert the basic geometric figures.

CO2 Demonstrate the importance of two dimensional geometric transformations and viewing.

CO3 Define the fundamentals of 3D concepts, 3D object representation and 3D geometric and modeling transformation.

CO4 Illustrate the concept of visible surface detection methods.

CO5 Define the color models and its applications.

UNIT - I

Output Primitives: Points and Lines - Line-Drawing Algorithms - Loading the Frame Buffer - Line Function - Circle-Generating Algorithms - Ellipse Generating Algorithms - **Attributes of Output Primitives:** Line Attributes - Curve Attributes - Color and Grayscale Levels - Area-Fill Attributes - Character Attributes.

UNIT - II

Two-Dimensional Geometric Transformations: Basic Transformations - Matrix Representations - Composite Transformations - Other Transformations - **Two-Dimensional Viewing:** The Viewing Pipeline - Viewing Coordinate Reference Frame - Window-to-Viewport Coordinate Transformation - 2D Viewing Functions - Clipping Operations - Point Clipping - Line Clipping - Polygon Clipping - Curve Clipping - Text Clipping.

UNIT - III

Three-Dimensional Concepts: 3D Display Methods - 3D Graphics Packages - **3D Object Representations:** Polygon Surfaces - Curved Lines and Surfaces - Quadric Surfaces - Superquadrics - Blobby Objects - Spline Representations - **3D Geometric and Modeling Transformations:** Translation - Rotation - Scaling - Other Transformations - Composite Transformations - 3D Transformation functions.
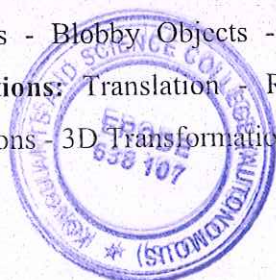
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UNIT - IV

Visible-Surface Detection Methods: Classification of Visible-Surface Detection Algorithms - Back-Face Detection - Depth-Buffer Method - A-Buffer Method - Scan-Line Method - Depth-Sorting Method - BSP-Tree Method - Area-Subdivision Method - Octree Methods - Ray-Casting Method - Curved Surfaces - Wireframe Methods - Visibility-Detection Functions.

UNIT - V

Color Models and Applications: Properties of Light - Standard Primaries and the Chromaticity Diagram - Intuitive Color Concepts - RGB Color Model - YIQ Color Model - CMY Color Model - HSV Color Model - Conversion Between HSV and RGB Models - Color Selection and Applications.

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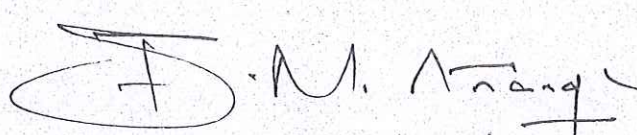
Donald D Hearn, M. Pauline Baker, Computer Graphics, Second Edition, Pearson Education, Seventeenth Impression 2013.

BOOKS FOR REFERENCE:

1. Willium M. Newman & Robert F. Sproull, Principles of Interactive Computer Graphics, Second Edition, Tata McGraw Hill, 2007.

2. Zhigang Xiang & Roy A. Plastock, Computer Graphics, Second Edition, McGraw Hill Education, 2000.

3. Apurva A. Desai, Computer Graphics, Prentice Hall of India, 2008.

4. Amarendra N Sinha & Arun D Udai, Computer Graphics, Tata McGraw Hill, 2008.

5. Udit Agarwal, Computer Graphics, Fouth Edition, S.K. Kataria & Sons, 2017.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Elective - II - B: Multimedia Systems	Total Marks : 100		Hours Per Week	Credits
VI	17UALET604		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the multimedia technologies and the latest developments in multimedia systems.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Demonstrate the understanding of the digital representation and visual display systems.

CO2 Illustrate the concept of text and color models.

CO3 Implement the drawing algorithms, transformations and surface texture.

CO4 Explain the fundamental characteristics of sound, audio recording systems and audio processing software.

CO5 Describe the video signal formats, video editing software and compression.

UNIT - I

Multimedia-An Overview: Introduction - Multimedia Presentation and Production - Characteristics of a Multimedia Presentation - Multiple Media - Utilities of Multisensory Perception - Hardware and Software Requirements - Uses of Multimedia - **Digital Representation:** Introduction - Analog Representation - Waves - Digital Representation - Analog to Digital Conversion - Digital to Analog Conversion - Quantization Error - Fourier Representation - Pulse Modulation - **Visual Display Systems:** Introduction - Cathode Ray Tube (CRT) - Video Adapter Card - Video Adapter Cable - Liquid Crystal Display (LCD) - Plasma Display Panel (PDP).

UNIT - II

Text: Introduction - Types of Text - Unicode Standard - Font - Insertion of Text - Text Compression - File Formats - **Image:** Introduction - Image Types - Seeing Color - Color Models - Basic Steps for Image Processing - Scanner - Digital Camera - Interface Standards - Specifications of Digital Images - Color Management System (CMS) - Device Independent Color Models - Gamma and Gamma Correction - Image Processing Software - File Formats - Image Output on Monitor - Image Output on Printer.
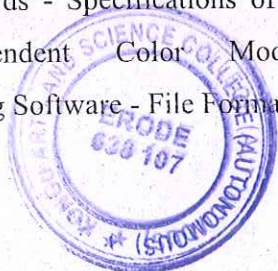
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UNIT - III

Graphics: Introduction - Advantages of Graphics - Uses of Graphics - Components of Graphics System - Coordinate Systems - Line Drawing Algorithms - Circle Drawing Algorithms - Filling Algorithms - Clipping Algorithms - Plotter - Transformations - 3D Graphics - 3D Modeling - Surface Characteristics and Texture - Lights.

UNIT - IV

Audio: Introduction - Acoustics - Nature of Sound Waves - Fundamental Characteristics of Sound - Musical Note and Pitch - Psycho-Acoustics - Elements of Audio Systems - Microphone - Amplifier - Loudspeaker - Audio Mixer - Digital Audio - Synthesizers - Musical Instrument Digital Interface (MIDI) - MIDI Messages - MIDI Connections - Basics of Staff Notation - Sound Card - Audio Transmission - Audio Recording Devices - Audio File Formats and CODECs - Audio Recording Systems - Audio and Multimedia - Voice Recognition and Response - Audio Processing Software.

UNIT - V

Video: Introduction - Analog Video Camera - Transmission of Video Signals - Video Signal Formats - Television Broadcasting Standards - Digital Video - Digital Video Standards - PC Video - Video Recording Formats and Systems - Video File Formats and CODECs - Video Editing - Video Editing Software - **Compression:** Introduction - Types of Compression - Types of Redundancies - Lossless/Statistical Compression Techniques - GIF Image Coding Standard - Lossy/Perceptual Compression Techniques - JPEG Image Coding Standard - MPEG Standards Overview - MPEG-1 Audio - MPEG-1 Video - MPEG-2 Audio - MPEG-2 Video - MPEG-4 - MPEG-7.

TEXTBOOK:

Ranjan Parekh, Principles of Multimedia, Tata McGraw Hill Education, Thirteenth Reprint 2011.

BOOKS FOR REFERENCE:

1. John F.Koegel Buford, Multimedia Systems, Pearson Education, Sixth Impression, 2009.
2. Tay Vaughan, Multimedia Making it Work, Seventh Edition, Tata McGRAW-Hill Education, New Delhi, Third reprint 2007.
3. Ze-Nianli, Mark S.Drew, Fundamentals of Multimedia, Pearson Educational, New Delhi, Third Impression 2008.
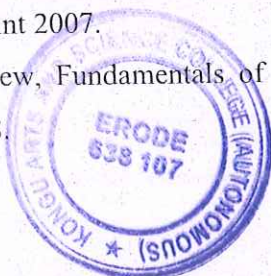
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4. Parabhat K. Andleigh, Kiran Thakrar, Multimedia Systems Design , PHI, Second Reprint 2003.

5. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing Communication and Application, Pearson Education, 2007.

QUESTION PAPER PATTERN		
SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Elective - II - C : 3D Animation	Total Marks : 100		Hours Per Week	Credits
VI	17UALET605		CIA : 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the principles and basic techniques of 3D Modeling and Animation.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Define 3D Animation and the production pipeline.

CO2 Develop the Digital imaging, video, animation, story and pre-visualization techniques with cameras.

CO3 Apply the basic principles, terminology and techniques of modeling and texturing behind polygons, NURBS, UVs, shaders.

CO4 Demonstrate the rigging and animation.

CO5 Illustrate the visual effects, lighting and rendering.

UNIT - I

3D Animation Overview: Defining 3D Animation - Exploring the 3D Animation Industry: Entertainment - Scientific - The History of 3D Animation: Early Computers - 1960s: The Dawn of Computer Animation - 1970s: The Building Blocks of 3D Animation - 1980s: The Foundations of Modern Computing - 1990s: 3D Animation Achieves Commercial Success - 2000s: The Refining of 3D Animation - The Essentials and Beyond - **Production Pipeline:** Understanding the Production Pipeline's Components - Working in 3D Animation Preproduction: Idea/Story - Script/Screenplay - Storyboard - Animatic/Pre-visualization - Design - Working in 3D Animation Production: Layout - Research and Development - Modeling - Texturing - Rigging/Setup - Animation - 3D Visual Effects - Lighting/Rendering - Working in 3D Animation Postproduction: Compositing - 2D Visual Effects/Motion Graphics - Color Correction - Final Output - Using Production Tools: Production Bible - Folder Management and Naming Conventions.

UNIT - II

Digital Imaging and Video: Understanding Digital Imaging: Pixels - Raster Graphics vs Vector - Graphics - Anti-Aliasing - Basic Graphic-File Formats - Channels - Color Depth or Bit Depth - Color Calibration - Understanding Digital Video: Resolution, Device Aspect Ratio and Pixel
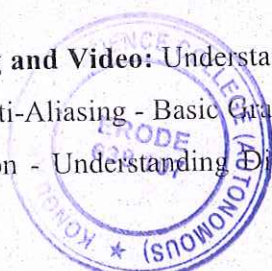
Aspect Ratio - Safe Areas - Interlaced and Progressive Scanning - Compression - Frame Rate and Timecode - Digital Image Capture - **Exploring Animation, Story, and Pre-visualization:** Using Principles of Fine Art and Traditional Animation: Modeling - Texturing/Lighting - Character Animation - VFX - Building a Good Story: Story Arc - Character, Goal, and Conflict - The Hero's Journey - Other Storytelling Principles - Using Pre-visualization Techniques: Basic Shot Framing - Camera Movements - Editing.

UNIT - III

Modeling and Texturing: Modeling - Polygons - NURBS - Subdivision Surfaces - Modeling Workflows - Texturing: UVs - Shaders - Texture Maps - Texturing Workflows.

UNIT - IV

Rigging and Animation: Rigging: Parenting - Pivot Positions - Skeleton System - Forward and Inverse Kinematics - Deformers - Constraints - Scripting - Expressions - The Basic Rigging Workflow - Animation: Keyframe - Graph Editor - Timeline - Dope Sheet - Workspace - Tracking Marks and Ghosting - FK and IK - Video Reference - The Basic Animation Workflow - Animation Techniques.

UNIT - V

Visual Effects, Lighting, and Rendering: Creating Visual Effects: Particles - Hair and Fur - Fluids - Rigid Bodies - Soft Bodies - The Basic VFX Workflow - Lighting: Light Types - Light Attributes - Lighting Techniques - The Basic Lighting Workflow - Rendering: Basic Rendering Methods - Global Illumination - Advanced Shader Functions - The Basic Rendering Workflow.

TEXTBOOK:

Andy Beane, 3D Animation Essentials, John Wiley & Sons, 2012.

BOOKS FOR REFERENCE:

1. Isaac Kerlow, The Art of 3D Computer Animation and Effects, John Wiley & Sons, Third Edition, 2004.

2. Mary Murphy, Beginner's Guide to Animation, Watson-Guptill Publications, 2008.

3. Richard Williams, The Animator's Survival Kit, Farrar, Straus and Giroux, 2012.

4. Alberto Menache, Understanding Motion Capture for Computer Animation, Second Edition, 2011.
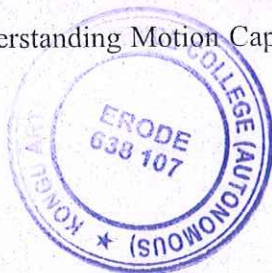
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5. Isaac Kerlow, 3D Art Essentials: The Fundamentals of 3D Modeling, Texturing and Animation, Focal Press, First Edition, 2011.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Elective - III - B: Ethical Hacking	Total Marks: 100		Hours Per Week	Credits
VI	17UALET607		CIA: 25	ESE: 75	6	4

OBJECTIVE:

To enable the students to learn the basics concepts of ethical hacking and perform various types of hacking terminologies.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Define the basic concepts of ethical hacking and foot printing.

CO2 Illustrate the scanning, enumeration and system hacking techniques.

CO3 Develop the skills to solve trojans, backdoors, viruses, worms, sniffers and session hijacking.

CO4 Implement the concepts of hacking web servers, SQL injection, buffer overflows and wireless hacking.

CO5 Identify the key aspects of physical security, cryptography algorithms and penetration testing methodologies.

UNIT - I

Introduction to Ethical Hacking, Ethics and Legality: Ethical Hacking Terminology - Types of Hacking Technologies - Phases Involved in Ethical Hacking - Five Stages of Ethical Hacking - Hacktivism - Types of Hacker Classes - Skills Required to Become an Ethical Hacker - Vulnerability Research - Ways to Conduct Ethical Hacking - Legal Implications of Hacking - **Foot Printing:** Foot Printing - Information gathering Methodology - Competitive Intelligence - DNS Enumeration.

UNIT - II

Scanning and Enumeration: Scanning: Port Scanning, Network Scanning and Vulnerability Scanning - Scanning Methodology - Ping Sweep Techniques - Enumeration: Null Sessions - SNMP Enumeration - **System Hacking:** Password-Cracking Techniques - Different Types of Passwords - Keyloggers and other Spyware Technologies - Escalating privileges - Rootkits - Hide Files - Steganography Technologies - Tracks and Erase Evidences.

UNIT - III

Trojans, Backdoors, Viruses and Worms: Trojans and Backdoors - Viruses and Worms - **Sniffers:** Protocols Susceptible to Sniffing - Active and Passive Sniffing - ARP Poisoning
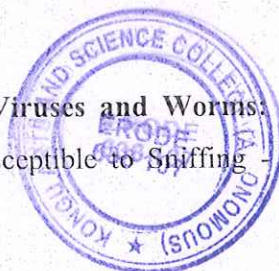
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Ethereal Capture and Display Filters - MAC Flooding - DNS Spoofing Techniques - Sniffing Countermeasures - **Denial of Service and Session Hijacking:** Denial of Service - Session Hijacking.

UNIT - IV

Hacking Web Servers, Web Application Vulnerabilities and Web-Based Password Cracking Techniques: Hacking Web Servers - Web Application Vulnerabilities - Web-Based Password Cracking Techniques - **SQL Injection and Buffer Overflows:** SQL Injection - Buffer Overflows - **Wireless Hacking:** Overview of WEP, WPA Authentication Mechanisms and Cracking Techniques - Wireless Sniffers and Locating SSIDs, MAC Spoofing - Rogue Access Points - Wireless Hacking Techniques - Methods used to Secure Wireless Networks.

UNIT – V

Physical Security: Physical Security Breach Incidents - Physical Security - Need for Physical Security - Accountable for Physical Security - Factors affecting Physical Security - **Evading IDSs, Honeypots, and Firewalls:** Types of Intrusion Detection Systems and Evasion Techniques - Firewall Types and Honeypot Evasion Techniques - **Cryptography:** Overview of Cryptography and Encryption Techniques - Public and Private Keys - MD5, SHA, RC4, RC5 and Blowfish Algorithms - **Penetration Testing Methodologies:** Defining Security Assessments - Penetration Testing Methodologies - Penetration Testing Steps - Pen-Test Legal Framework - Automated Penetration Testing Tools.

TEXTBOOK:

Kimberly Graves, CEH Official Certified Ethical Hacker Review Guide, Wiley Publications, 2007.

BOOKS FOR REFERENCE:

1. Michel T.Simpson, Ethical Hacking and Network Defense, Cegage Learning India Private Limited, 2009.
2. Micheal Gregg, Certified Ethical Hacker Cert guide, Pearson Education, 2014.
3. Patrick Engebretson, The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy, Second Edition, Syngress Media, 2012.
4. Rajat Khare, Network Security and Ethical Hacking, Luniver Press, 2006.
5. Ankit Fadia, Ethical Hacking, Second edition, Macmillan India Ltd, 2006.

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QUESTION PAPER PATTERN

SECTION - A	SECTION - B	SECTION - C
10 x 1 = 10 Marks	**5 x 7 = 35 Marks**	**3 x 10 = 30 Marks**
(Multiple choice, Four options)	(Either or choice)	(Answer any three questions)
Two questions from each unit	Two questions from each unit	One question from each unit

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Sem	Course Code	Skill Based Course 4 (Lab): Software Engineering and CASE Tools Lab	Total Marks: 75		Hours Per Week	Credits
VI	17UALSP610		CIA: 30	ESE: 45	3	3

OBJECTIVE:

To enable the students to develop the phases of software engineering.

COURSE OUTCOMES:

At the end of the course, students will be able to

CO1 Develop the project planning phase for the software application.

CO2 Develop the software requirement analysis document for the software application.

CO3 Develop the design models for the software application.

CO4 Develop the source code for the software project.

CO5 Construct the test cases for the software project.

Perform the software engineering activity mentioned below for the Student Mark Analysis System and Payroll Processing System.

1. **Problem Analysis and Project Planning:**

    Study the problem and prepare the project scope, objective and Gantt chart.

2. **Requirement Analysis:**

    Identify the phases and individual modules of the project and prepare the software requirement specification.

3. **Design:**

    i. Draw the following UML diagrams:

    - Use-case diagram
    - Activity diagram
    - Class diagram
    - Sequence diagram

    ii. Draw the Data Flow Diagram (DFD)

4. **Implementation:**

    Implement the project using VB .NET as front end and SQL Server as back end.

5. **Testing:**

    Prepare test plan and develop test case.

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QUESTION PAPER PATTERN

PROGRAM 1	Program 1 should be implementation of the software engineering activity for the Student Mark Analysis System or the Payroll Processing System.
PROGRAM 2	Program 2 should be any one of the following software engineering activities for the application mentioned in the program 1 1. Problem Analysis and Project Planning 2. Requirement Analysis 3. Design using UML diagrams 4. Design using DFD 5. Testing

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