



# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

AN AUTONOMOUS INSTITUTION

Accredited by NAAC with 'A+' Grade.

(Sponsored by TKR Educational Society, Approved by AICTE, Affiliated to JNTU H)

Medbowli, Meerpet, Balapur, Hyderabad, Telangana – 500 097

Phone: 9100377790, email: info@tkrcet.ac.in, web site: www.tkrct.ac.in



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### VALUE ADDED COURSE

### ON

### Gaming and Virtual reality

B.Tech: II

Semester: I

Academic Year: 2025-26

### Course Objectives

1. To understand the fundamentals of the Unity Game Engine and C# programming for game development.
2. To design and develop interactive 2D games using Unity components, physics, animation, and UI systems.
3. To learn the principles, hardware, software, and geometric foundations of Virtual Reality systems.
4. To explore human perception, interaction techniques, tracking systems, and immersive experiences in VR environments.
5. To develop game and VR applications while understanding the relationship between Virtual Reality, Augmented Reality, and emerging technologies.

### SYLLABUS

#### Unit – I: Unity Game Engine Fundamentals

Introduction to Unity Game Engine, Intro to Tools & Navigation, Terrain System in Unity, Camera Control in Unity, Scene Navigation, Project Setting / Player Setting, Game Publishing Using Unity, Intro to C# Programming in Unity, Constants and Variables, Integers, Floats and Strings.

#### Unit – II: C# Programming and 2D Game Development

Arrays and Lists, Arithmetical Operators, Using If Statements, Writing While Statements, Writing For Statements and Other Basic C# Concepts in Unity, Unity Game Engine for Developing 2D Games, Intro to 2D Game System in Unity, Sprite Editor in Unity, Sprite Animation in Unity, 2D Physics in Unity, 2D Components, and UI System in Unity.

#### Unit – III: Foundations of Virtual Reality

Introduction to Virtual Reality, Modern VR Experiences, Virtual Reality Systems, Hardware and Software, Geometry of Virtual Worlds, Geometric Models, Changing Position and Orientation, Axis, Angle Representations, and Transformations.

#### Unit – IV: Visual and Perceptual Aspects of VR

Light and Optics, Behavior of Light, Optical Aberrations, Cameras and Displays, The Physiology of Human Vision, Implications of VR, Visual Perception, Perception of Depth, Motion and Color, and Tracking 2D and 3D Orientation.

#### Unit – V: Interaction and Emerging Technologies

Interaction, Locomotion, Interaction Mechanisms, Auditory Perception and Rendering, The Relationship Between Augmented Reality and Other Technologies, VR Application Development, Game and VR Project Development, Future Trends in VR and AR, and Project Presentation & Review.



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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### VALUE-ADDED COURSE ON Professional Ethics

B.Tech: II

Semester: II

Academic Year: 2025-26

#### Course Objectives

1. To understand the concepts of human values, ethics, morals, and their significance in personal and professional life.
2. To develop virtues such as honesty, empathy, cooperation, courage, respect, and responsibility.
3. To enhance character, ethical decision-making, social skills, and workplace professionalism.
4. To promote mental well-being through yoga, meditation, stress management, and self-development practices.
5. To improve communication, leadership, and social responsibility for effective participation in society and the workplace.

#### SYLLABUS

##### Unit – I: Foundations of Human Values and Ethics

Human Values, Morals, Values, Types of Values, Evolution of Human Values, Ethics, Integrity, Work Ethics, and Service Learning.

##### Unit – II: Virtues and Personal Development

Virtues, Civic Virtues, Respect for Others, Living Peacefully, Caring, Sharing, Honesty, Courage, Valuing Time, Cooperation Commitment, Empathy, and Self-Confidence.

##### Unit – III: Character Building and Professional Ethics

Challenges in the Workplace, Character, Spirituality, Self-Help Skills, Social Skills, Ethical Skills, Professional Responsibility, and Ethical Decision-Making.

##### Unit – IV: Wellness and Stress Management

Introduction to Yoga for Professional Excellence, Meditation for Stress Management, Mindfulness Practices, Emotional Well-Being, Personal Growth, and Work-Life Balance.

##### Unit – V: Communication and Social Responsibility

Internal Communication, Interpersonal Communication Skills, Teamwork and Collaboration, Leadership and Social Responsibility, Human Values in Professional Life, and Project Presentation & Reflection.



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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### VALUE-ADDED COURSE ON Chat Bots

B.Tech: III

Semester: I

Academic Year: 2025-26

#### Course Objectives

1. To understand the fundamentals, types, applications, benefits, and challenges of chatbot technologies.
2. To learn various chatbot development approaches using no-code, low-code, and programming-based platforms.
3. To design effective chatbot conversations, user experiences, and communication strategies based on user needs.
4. To understand NLP concepts such as intent recognition, entity extraction, context management, and conversational design.
5. To develop, test, deploy, analyze, and optimize chatbot solutions for real-world applications.

#### SYLLABUS

##### Unit – I: Foundations of Chatbots

Introduction to Chatbots: Definition and History, Types of Chatbots (Rule-Based, AI-Based, Hybrid), Applications of Chatbots in Different Industries, Benefits and Challenges of Chatbots, Revision of Chatbot Fundamentals, Ways to Create Chatbots: No-Code Platforms, Ways to Create Chatbots: Low-Code Platforms, and Ways to Create Chatbots: Programming-Based Development.

##### Unit – II: Chatbot Development and Design

Comparison of Chatbot Development Approaches, Create a Basic Chatbot, Introduction to Design Thinking for Chatbots, Understanding User Needs and Personas, Conversation Flow Design, Designing Effective Chatbot Dialogues, Chatbot Welcome Messages and First Impressions, and Creating Engaging Greetings and Introductions.

##### Unit – III: Chatbot Channels and Communication

Chatbot Channels: Website Chatbots, Chatbot Channels: Social Media Platforms, Chatbot Channels: Messaging Apps and Voice Assistants, Choosing the Right Channel for Your Chatbot, Data Collection with Chatbots, and Personalizing Chatbot Communication.

##### Unit – IV: Natural Language Processing for Chatbots

How Chatbots Process Human Language (NLP Basics), Intent Recognition and Entity Extraction, Context Management in Conversations, Creating User-Friendly Error Messages, Advanced Conversational Design, and Chatbot User Experience Optimization.



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## **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

### **Unit – V: Testing, Deployment, and Analytics**

Testing Chatbots: Functional and User Testing, Chatbot Implementation and Deployment, Chatbot Analytics and Performance Metrics, Build, Test, Deploy, and Analyze a Chatbot Project, Chatbot Maintenance and Improvement, and Project Presentation & Review.



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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### VALUE-ADDED COURSE ON Critical Thinking

B.Tech: III

Semester: II

Academic Year: 2025-26

#### Course Objectives

1. To understand the principles, elements, and importance of critical thinking in personal, academic, and professional contexts.
2. To develop reasoning, decision-making, and problem-solving skills through logical and analytical thinking techniques.
3. To evaluate information, arguments, assumptions, and evidence using intellectual standards and critical analysis.
4. To identify cognitive biases, logical fallacies, and misinformation while applying ethical and reflective thinking.
5. To apply critical thinking skills to real-life situations, professional challenges, and informed decision-making processes.

#### SYLLABUS

##### Unit – I: Foundations of Critical Thinking

Introduction to Critical Thinking, Importance of Critical Thinking, Elements of Thought, Intellectual Standards, Observation and Perception, Asking Effective Questions, Identifying Problems and Issues, Gathering and Evaluating Information, Distinguishing Facts from Opinions, and Recognizing Assumptions.

##### Unit – II: Reasoning and Problem Solving

Logical Reasoning Basics, Deductive Reasoning, Inductive Reasoning, Cause and Effect Analysis, Decision-Making Strategies, Problem-Solving Techniques, and Creative Thinking and Innovation.

##### Unit – III: Evaluating Information and Arguments

Cognitive Biases, Common Logical Fallacies, Evaluating Arguments, Constructing Strong Arguments, Evidence-Based Reasoning, Critical Reading Skills, and Critical Listening Skills.

##### Unit – IV: Media, Data, and Ethical Reasoning

Media and Information Literacy, Analyzing Data and Statistics, Ethical Reasoning, Reflective Thinking, Information Verification Techniques, and Responsible Decision-Making.



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## **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

### **Unit – V: Critical Thinking in Practice**

Critical Thinking in Real-Life Situations, Real-World Problem Analysis, Critical Thinking for Professional Development, Collaborative Decision-Making, Critical Thinking Capstone Activity and Review, and Project Presentation & Reflection.