THIRD SEMESTER
(Detailed Syllabus)

'GAMING
&
ANIMATION'

FUNDAMENTALS OF ANIMATION

Course Code:	503001
Course Title	Fundamentals of Animation
No. of Credits	4 (TH:4,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Demonstrate a solid understanding of animation principles and techniques.
2. Apply the principles of timing, spacing, squash and stretch, anticipation, and follow-through in animations.
3. Develop skills in character animation, including creating realistic movements and expressions.
4. Utilize various animation tools and software to create animations.
5. Understand the importance of storytelling in animation and effectively convey narratives through animated sequences.
6. Collaborate effectively in team-based animation projects, demonstrating strong communication and teamwork skills.

COURSE CONTENTS

1. **Introduction to Animation:**
- Evolution of animation.
- Basic principles of animation.

2. **Traditional Animation Techniques:**
- Frame-by-frame animation: principles & techniques.
- Walk cycles, run cycles & other basic character movements.

3. **Character Animation:**
- Expressions and emotions.
- Lip-sync animation.

4. **Digital Animation Tools and Software:**
- Introduction to popular animation software such as Adobe Animate, Toon Boom Harmony, or Blender.
- Understanding the interface, tools, and workflows of animation software.

5. **Storytelling and Narrative in Animation:**
- Storyboarding.
- Narrative structure, character development, and plot progression in animation.

6. **Team-based Animation Project:**
- Collaborative animation project involving concept development, character design, storyboarding, and animation production.
- Applying animation principles and techniques to create a final animated sequence.

Study Books

1. "The Animator's Survival Kit" by Richard Williams
2. "Character Animation Crash Course!" by Eric Goldberg
3. "The Illusion of Life: Disney Animation" by Ollie Johnston and Frank Thomas
4. "Timing for Animation" by Harold Whitaker and John Halas
5. "Cartoon Animation" by Preston Blair
6. "The Animator's Sketchbook: How to See, Interpret & Draw Like a Master Animator" by Tony White

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HISTORY OF ANIMATION

Course Code:	503002
Course Title	History of Animation
No. of Credits	4 (TH:4,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Demonstrate a comprehensive understanding of the history and evolution of animation.
2. Analyze and interpret influential animated works and their impact on the development of the animation industry.
3. Identify and discuss key milestones, techniques, and technological advancements in the history of animation.
4. Evaluate the cultural, social, and artistic significance of animated films in different eras and regions.
5. Connect historical developments in animation to contemporary practices and trends in the industry.
6. Communicate effectively about the historical context and critical analysis of animated works.

COURSE CONTENTS

1. **Early Animation:**

- Overview of early experimental animation techniques & inventors.

2. **Golden Age of Animation:**

- Examination of the rise of animation studios and influential animators during the 1920s to 1940s.
- Analysis of classic animated films and characters from studios like Disney, Warner Bros. and Fleischer.

3. **Experimental and Independent Animation:**

- Exploration of avant-garde & experimental animation movements.
- Study of independent animators and their contributions to artistic expression in animation.

4. **International Animation:**

- Survey of animation styles and techniques from different regions and cultures.
- Analysis of notable animation studios and filmmakers from countries such as Japan, France, and Eastern Europe.

5. **Stop Motion Animation:**

- History & development of stop motion animation techniques.
- Study of prominent stop motion animators and films.

6. **Contemporary and Digital Animation:**

- Impact of computer-generated imagery (CGI) and digital tools on animation.
- Discussion of current trends.

Study Books :

1. "The History of Animation: Enchanted Drawings" by Charles Solomon
2. "The Animator's Survival Kit" by Richard Williams
3. "Cartoon Modern: Style and Design in Fifties Animation" by Amid Amidi
4. "The Illusion of Life: Disney Animation" by Ollie Johnston and Frank Thomas
5. "Anime: A History" by Jonathan Clements
6. "Suspended Animation: Pain, Pleasure and Punishment in Medieval Culture" by Jacqueline Hamesse

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2D ANIMATION

Course Code:	503003
Course Title	2D Animation
No. of Credits	8 (TH:4,T:0,P:8)

Course Outcomes: After completion of the course students should be able to

1. Apply animation principles to create realistic and engaging movement.
2. Develop walk cycles showcasing weight distribution and fluidity for characters.
3. Create dynamic effects animations, adhering to physics and timing techniques.
4. Produce storyboards that effectively communicate narrative structure and camera angles.
5. Collaborate within an animation team to contribute to cohesive projects.

COURSE CONTENTS

1. **Basic Animation Exercises:**

- Principles of Animation: Introduce the 12 principles of animation.
- Easing In and Out: Basic concept.
- Arcs and Paths of Action: Basic concept.

2. **Character Animation:**

- Walk Cycles: Basic concept.
- Character Design: Basic concept.
- Staging: Basic concept.

3. **Effects Animation:**

- Physics & Dynamics: Introduce the basic physics behind various effects.
- Timing & Impact: Explain how timing affects the perception of impact.

4. **Storyboarding and Animatics:**

- Storytelling Fundamentals:Basics of narrative structure.
- Shot Composition: Study of camera angles, framing & composition.
- Timing and Pacing: Use of animatics to establish the timing and pacing of the animation.

5. **Team-based Animation Project:**

- Collaboration & Communication: Importance of effective communication and teamwork in an animation project.
- Roles & Responsibilities: Different roles in an animation team.
- Pipeline and Workflow: Stages of animation production, from concept to post-production.

PRACTICAL OUTCOMES: At the end of the course, the student will be able to:

1. Demonstrate proficiency in using 2D animation software tools, such as Animate CC (formerly Flash) and Toon Boom Harmony.
2. Apply animation principles, including timing, spacing, squash and stretch, and anticipation, to create smooth and convincing 2D animations.
3. Develop skills in character animation, including creating expressive movements, gestures, and interactions.
4. Utilize key frame animation techniques to bring static images to life and create dynamic sequences.
5. Understand the process of storyboard creation and effectively translate storyboards into animated scenes.
6. Collaborate effectively in a team-based animation project, demonstrating strong communication and problem-solving skills.

List of Practicals:

1. **Basic Animation Exercises:**

- Create simple bouncing ball animations to practice timing, spacing, and squash and stretch techniques.
- Animate a pendulum swing to understand the principles of anticipation and follow-through.

2. **Character Animation:**

- Create a walk cycle animation for a character, focusing on weight distribution and fluid movement.
- Animate a dialogue scene with lip-sync to practice syncing character movements with dialogue or sound.

3. **Effects Animation:**

- Explore effects animation techniques, such as animating water, fire, smoke, or other dynamic elements.
- Create an animated sequence with various effects to enhance the visual impact of the animation.

4. **Storyboarding and Animatics:**

- Develop storyboards for a short animated sequence, planning out the shots and camera angles.
- Create an animatic, which is a rough animated storyboard, to visualize the timing and pacing of the animation.

5. **Team-based Animation Project:**

- Collaborate with a team to create a short animated film or sequence.
- Assign roles & responsibilities for concept development, character design, storyboard creation, animation production, and post-production.

Study Books:

1. "The Animator's Survival Kit" by Richard Williams
2. "Cartoon Animation" by Preston Blair
3. "The Animator's Workbook: Step-by-Step Techniques of Drawn Animation" by Tony White
4. "Animating with Flash: MX, Professional, Creative Animation Techniques" by Alex Michael
5. "The Art of Pixar Animation Studio" by Amid Amidi
6. "Toon Boom Studio: Beginner's Guide" by Joan Pronovost

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DESIGN DEVELOPMENT ADVANCEMENT

Course Code:	503004
Course Title	Design Development Advancement
No. of Credits	4 (TH:4,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Demonstrate advanced knowledge and skills in design development, including conceptualization, prototyping, and execution.
2. Apply design thinking methodologies and problem-solving strategies to tackle complex design challenges.
3. Utilize advanced design tools and technologies to create innovative and visually compelling design solutions.
4. Develop a deep understanding of design principles, aesthetics, and user-centered design approaches.
5. Collaborate effectively in multidisciplinary design teams, demonstrating strong communication and project management skills.
6. Critically analyse and evaluate design projects, incorporating feedback and iterating to achieve refined design outcomes.

COURSE CONTENTS

1. **Design Research and Concept Development:**

- Advanced methods for conducting design research, including user interviews, surveys, and observations.
- Ideation techniques, brainstorming & concept development processes.

2. **User-Centered Design:**

- Human-centered design approaches, usability testing, and overview of user experience (UX) research methods.
- Designing for specific user groups and understanding user behaviors and motivations.

3. **Advanced Visual Communication:**

- Advanced graphic design principles, typography, layout, and composition.
- Exploring innovative approaches to visual storytelling and visual communication techniques.

4. **Design Prototyping and Iteration:**

- Rapid prototyping methods.
- Iterative design processes.

5. **Design for Emerging Technologies:**

- Design considerations for emerging technologies.
- Ethical and sustainable design practices.

6. **Collaborative Design Projects:**

- Engaging in collaborative design projects with a focus on interdisciplinary teamwork and effective communication.
- Advanced design principles and methodologies.

Study Books:

1. "The Design of Everyday Things" by Don Norman
2. "Universal Principles of Design" by William Lidwell, Kritina Holden and Jill Butler
3. "Designing for Interaction: Creating Innovative Applications and Devices" by Dan Saffer
4. "Designing Interactions" by Bill Moggridge
5. "The Elements of Typographic Style" by Robert Bringhurst
6. "Creative Workshop: 80 Challenges to Sharpen Your Design Skills" by David Sherwin

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PREPRODUCTION OF ANIMATION & GAMING

Course Code:	503005
Course Title	Preproduction of Animation & Gaming
No. of Credits	4 (TH:4,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Demonstrate a comprehensive understanding of the preproduction phase in animation and gaming projects.
2. Apply effective research and concept development techniques to generate compelling ideas and narratives.
3. Develop proficiency in creating storyboards, concept art, and previsualization materials for animation and gaming projects.
4. Utilize industry-standard software and tools to create and organize preproduction assets.
5. Collaborate effectively in multidisciplinary teams, demonstrating strong communication and problem-solving skills.
6. Apply critical analysis and evaluation to refine and iterate preproduction materials for optimal project planning.

COURSE CONTENTS

1. **Introduction to Preproduction:**

- Preproduction phase in animation & gaming, effective planning and organization.

2. **Research and Concept Development:**

- Inspiration and idea generation, developing concepts, themes & narratives for animation and gaming projects.

3. **Storyboarding and Animatics:**

- Techniques for creating visual storytelling through storyboards and animatics.
- Understanding shot composition, camera angles & narrative pacing.

4. **Concept Art and Character Design:**

- Creating concept art to visually communicate the look and feel of characters, environments, and objects.
- Developing character design sheets, including poses, expressions, and costume variations.

5. **Previsualization and Layout:**

- Previsualizing animated sequences and game levels using 2D or 3D tools.
- Designing layouts for scenes, including camera placement, blocking, and visual composition.

6. **Collaboration and Project Management:**

- Effective communication and collaboration within multidisciplinary teams.
- Project planning, scheduling, and resource management in the preproduction phase.

Study Books:

1. "The Art of Pixar: 25th Anniversary" by Amid Amidi
2. "The Animator's Survival Kit" by Richard Williams
3. "Storyboarding Essentials: How to Translate Your Story to the Screen for Film, TV, and Other Media" by David Harland Rousseau
4. "The Art of Game Design: A Book of Lenses" by Jesse Schell
5. "Creating the Art of the Game" by Matthew Omernick
6. "The Visual Story: Creating the Visual Structure of Film, TV, and Digital Media" by Bruce Block

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DATA COMMUNICATION & NETWORKING

Course Code:	493001
Course Title	Data Communication & Networking
No. of Credits	4 (TH:4,T:0,P:0)

COURSE OUTCOMES: At the end of the course, the student will be able to:

1. Understand the fundamental concepts, principles, and protocols of data communication and networking.
2. Analyse and evaluate different network architectures and technologies for efficient data transmission and connectivity.
3. Demonstrate proficiency in configuring and troubleshooting network devices, protocols, and services.
4. Design and implement secure and reliable network infrastructures to meet organizational requirements.
5. Apply knowledge of network management and administration practices for efficient network operation.
6. Collaborate effectively in multidisciplinary teams, demonstrating strong communication and problem-solving skills in network-related scenarios.

COURSE CONTENTS

1. **Introduction to Data Communication & Networking**

- Basic concept of communication system.
- Introduction to network components, devices, and their functionalities.

2. **Network Architecture and Protocols:**

- TCP/IP protocol.
- Local area networks (LANs) and wide area networks (WANs).

3. **Network Infrastructure and Devices:**

- Network devices, such as routers, switches & firewalls.
- Network media & cabling types for data transmission.

4. **Network Services and Applications:**

- Introduction to network services.
- Network application layer protocols.

5. **Network Security and Management:**

- Network security principles, authentication, encryption, and firewall technologies.
- Network management tools and techniques.

6. **Network Design and Implementation:**

- Designing network infrastructures.

Study Books:

1. "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross
2. "Data Communications and Networking" by Behrouz A. Forouzan
3. "TCP/IP Illustrated, Volume 1: The Protocols" by W. Richard Stevens
4. "Network Warrior: Everything You Need to Know That Wasn't on the CCNA Exam" by Gary A. Donahue
5. "CCNA Routing and Switching Complete Study Guide: Exam 100-105, Exam 200-105, Exam 200-125" by Todd Lammle
6. "Network Security Essentials: Applications and Standards" by William Stallings.

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PHOTOSHOP-FUNDAMENTALS OF VIDEO EDITING

Course Code:	503007
Course Title	Photoshop-fundamentals of Video Editing
No. of Credits	8 (TH:4,T:0,P:8)

Course Outcome: After completion of the course, the students should be able to-

1. Understand the fundamentals of video editing, including its purpose and significance in visual storytelling, and differentiate between linear and non-linear editing systems.
2. Apply visual enhancements by using transitions for maintaining visual continuity and incorporating visual effects, text overlays, and motion graphics to enhance the visual impact of videos. Also, enhance audio experience through sound effects, background music, and audio transitions.
3. Master color correction techniques to adjust video colors, brightness, contrast, and saturation, and implement color grading to achieve desired visual aesthetics and mood.
4. Utilize advanced editing tools such as keyframing for precise control of animations and effects, and apply layering and compositing techniques to create complex video compositions.
5. Collaborate effectively within a video production team, understanding the importance of teamwork, and assigning roles and responsibilities for various aspects of video editing.

COURSE CONTENTS

1. **Basic Video Editing Techniques:**
   - Introduction to Video Editing: Purpose and significance of video editing.
   - Video Formats and Codecs: Video formats, codecs and their impact on quality and file size.
   - Non-linear Editing Systems: Non-linear editing systems and their advantages over linear editing.

2. **Adding Transitions and Effects:**
   - Visual Continuity: Discussing the role of transitions in maintaining visual coherence between scenes.
   - Video Effects and Motion Graphics: Exploring the creative possibilities of adding visual effects, text overlays, and motion graphics.

3. **Audio Editing and Mixing:**
   - Importance of Sound: Understanding the crucial role of audio in enhancing the viewer's experience.
   - Audio Editing Tools: Introduction to audio editing tools, including adjusting levels, adding music, and sound effects.

4. **Color Correction and Visual Enhancements:**
   - Color Theory: Basics of color theory and its application in video editing.
   - Color Grading: Basics of color correction and grading techniques to achieve desired visual aesthetics.

5. **Advanced Techniques and Keyframing:**
    - Keyframing Fundamentals: Basics of keyframing for controlling animations and effects over time.
    - Advanced Editing Tools: Basics of advanced editing tools like layering, compositing, and advanced effects.

6. **Team-Based Video Editing Project:**
    - Collaboration in Video Editing: Understanding the importance of teamwork in producing professional video content.
    - Roles and Responsibilities: Discussion on roles such as editor, sound designer, and project manager within a team.

PRACTICAL OUTCOMES: At the end of the course, the student will be able to:

1. Understand the fundamental concepts and techniques of video editing using software tools like Photoshop, Filmora, and Premiere Pro.
2. Apply video editing principles, including sequencing, trimming, transitions, and effects, to create visually compelling videos.
3. Develop proficiency in manipulating video footage, audio, and images to tell a coherent and engaging story.
4. Utilize advanced video editing features, such as color correction, key framing, and layering, to enhance the visual quality of videos.
5. Collaborate effectively in team-based video editing projects, demonstrating strong communication and project management skills.
6. Critically analyse & evaluate edited videos, incorporating feedback and iterating to achieve polished and professional outcomes.

List of Practicals:

1. Basic Video Editing Techniques:

- Importing video footage & organizing media assets in the software.
- Cutting & arranging video clips to create a coherent sequence.

2. Adding Transitions and Effects:

- Applying transitions between video clips to create smooth scene transitions.
- Adding visual effects, such as text overlays, filters, and motion graphics, to enhance the video.

3. Audio Editing and Mixing:

- Adjusting audio levels, adding background music, and incorporating sound effects.
- Syncing audio with video clips & applying audio transitions.

4. Color Correction and Visual Enhancements:

- Adjusting video colors, brightness, contrast, and saturation for improved visual quality.
- Applying visual effects & filters to create a desired visual style.

5. Advanced Techniques and Key framing:

- Utilizing advanced video editing features for precise control of effects and animations.
- Creating complex video compositions by layering multiple video and audio tracks.

6. Team-Based Video Editing Project:

- Collaborating in a team to edit a short film or video project.
- Assigning roles and responsibilities for footage selection, editing, sound design, and final production.

Study Books:

1. "Adobe Premiere Pro Classroom in a Book" by Adobe Creative Team
2. "Adobe Photoshop CC Classroom in a Book" by Andrew Faulkner and Conrad Chavez
3. "The Cool Stuff in Premiere Pro: Learn Advanced Editing Techniques" by Jarle Leirpoll
4. "The Adobe Photoshop Light room Classic CC Book: Plus an introduction to the new Adobe Photoshop Light room CC across desktop, web, and mobile" by Martin Evening
5. "Film Editing: Great Cuts Every Filmmaker and Movie Lover Must Know" by Gael Chandler
6. "Digital Filmmaking for Beginners: A Practical Guide to Video Production" by Michael Hughes

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SUMMER INTERNSHIP-I

Course Code:	AS301
Course Title	Summer Internship - I
No. of Credits	2 (TH:0,T:0,P:0)

Summer Internship provides an invaluable opportunity for students pursuing their Diploma in Engineering to gain real-world experience and exposure to various industrial production units and commercial activities related to their field of study. This program aims to bridge the gap between theoretical knowledge and practical application, equipping students with the necessary skills and expertise to thrive in the branch related industry.

At the end of the **Second semester**, students will undertake a minimum 3 to 4-week Summer Internship, scheduled during the semester break following the Second Semester examinations. The respective Heads of Departments (HoDs) and experienced faculty members will guide and assist students in securing suitable training opportunities that align with their specialization. Each student will have a personalized training schedule developed in collaboration with the training providers, ensuring a comprehensive and enriching learning experience.

Before starting their training, students will receive a comprehensive briefing about the organizational setup, product range, manufacturing processes, and significant machinery and materials used in the training organization. This preliminary understanding will enhance their engagement and productivity during the internship.

To ensure a fruitful learning experience, faculty members

will supervise students during their training in the industry or field organization. Each faculty member will mentor a small group of 4-5 students, providing personalized attention and guidance. Students will be encouraged to maintain daily reports in their diaries, which will assist them in composing their final training report and presentation.

The evaluation process for the Summer Internship will include both internal and external assessments, as per the study and evaluation scheme of the Third Semester. During the viva - voce / presentation examination, students' understanding of materials, industrial processes, practices in the industry, and problem-solving abilities will be assessed. The evaluation will also focus on their application of knowledge and skills in real-life situations.

The components of evaluation will comprise:

(a) Punctuality and regularity: 15%

(b) Initiative in learning new things: 15%

(c) Relationship with peers and colleagues: 10%

(d) Summer Internship report: 25%

(e) Viva-Voce: 35%

The purpose of summer Internship program is to create a transformative experience for students, empowering them to excel in their future careers and make meaningful contributions to the Engineering industry. The collaborative efforts of experienced faculty members and industry partners will ensure that students may gain valuable insights and practical skills during this immersive learning journey.

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