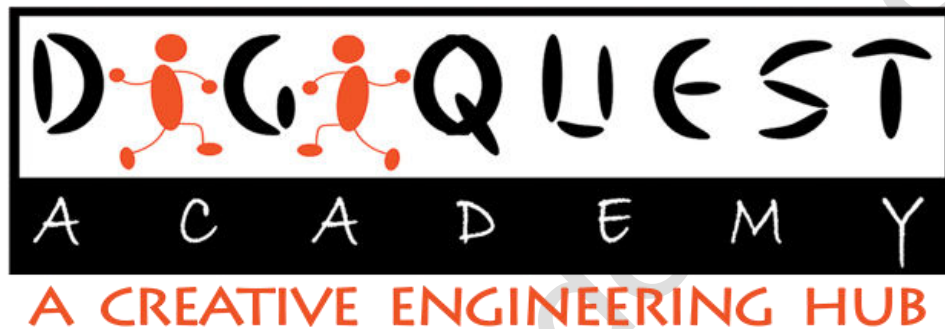


4-Year

BACHELOR OF FINE ARTS

in

ANIMATION & GAMING



In Collaboration with



JAWAHARLAL NEHRU ARCHITECTURE AND FINE ARTS UNIVERSITY
Masab Tank, Hyderabad

6-3-902/C, 5th floor, Mandhani Complex, Next to Yashoda Hospital, Somajiguda, Hyderabad.

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COURSE STRUCTURE - BFA ANIMATION & GAMING**Year 1 | Semester 1**

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 1.1.1 T	ENGLISH – I	36	3 Hrs.	50	50	100
2	AG 1.1.2 T	HISTORY OF ANIMATION	36	3 Hrs.	50	50	100
3	AG 1.1.3 P	DRAWING – I	216	5 Hrs.	50	50	100
4	AG 1.1.4 P	VISUAL COMMUNICATION	216	5 Hrs.	50	50	100
5	AG 1.1.5 T	BASIC MATHEMATICS FOR GAMES	36	3 Hrs.	50	50	100
Total :			540		250	250	500

Year 1 | Semester 2

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 1.2.1 T	ENGLISH – II	36	3 Hrs.	50	50	100
2	AG 1.2.2 P	GRAPHIC DESIGNING	160	5 Hrs.	50	50	100
3	AG 1.2.3 P	DRAWING – II	156	5 Hrs.	50	50	100
4	AG 1.2.4 P	CONCEPT ART	156	5 Hrs.	50	50	100
5	AG 1.2.5 T	BASIC PHYSICS FOR GAMES	32	3 Hrs.	50	50	100
Total :			540		250	250	500

Year 2 | Semester 1

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 2.1.1 P	FUNDAMENTALS OF GAME MODELING	150	15 Hrs.	50	50	100
2	AG 2.1.2 P	ESSENTIALS OF GAME MODELING	130	10 Hrs.	50	50	100
3	AG 2.1.3 P	TEXTURING AND SHADING	130	10 Hrs.	50	50	100
4	AG 2.1.4 P	RIGGING	102	10 Hrs.	50	50	100
5	AG 2.1.5 T	ENVIRONMENTAL STUDIES	28	3 Hrs.	50	50	100
Total :			540		250	250	500

Year 2 | Semester 2

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 2.2.1 P	DIGITAL PAINTING	120	10 Hrs.	50	50	100
2	AG 2.2.2 P	DIGITAL SCULPTING	120	10 Hrs.	50	50	100
3	AG 2.2.3 P	SOUND EDITING	60	5 Hrs.	50	50	100
4	AG 2.2.4 P	CHARACTER ANIMATION	180	15 Hrs.	50	50	100
5	AG 2.2.5 P	PRE-PRODUCTION	60	10 Hrs.	50	50	100
Total :			540		250	250	500

Year 3 | Semester 1

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 3.1.1 T	GAME PSYCHOLOGY	10	3 Hrs.	50	50	100
2	AG 3.1.2 T	STORY TELLING FOR GAMES	10	3 Hrs.	50	50	100
3	AG 3.1.3 P	GAME DEVELOPMENT FOR WEB	210	10 Hrs.	50	50	100
4	AG 3.1.4 P	BASICS OF GAME PROGRAMMING	210	10 Hrs.	50	50	100
5	AG 3.1.5 P	CONCEPT ART FOR GAMES	100	10 Hrs.	50	50	100
Total :			540		250	250	500

Year 3 | Semester 2

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 3.2.1 P	PRE-PRODUCTION FOR GAMES	36	10 Hrs.	50	50	100
2	AG 3.2.2 P	GAME ENGINE – I	126	15 Hrs.	50	50	100
3	AG 3.2.3 P	LEVEL DESIGNING	126	15 Hrs.	50	50	100
4	AG 3.2.4 P	ARTIFICIAL INTELLIGENCE FOR GAME	126	15 Hrs.	50	50	100
5	AG 3.2.5 P	C# PROGRAMMING	126	10 Hrs.	50	50	100
Total :			540		250	250	500

Year 4 | Semester 1

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 4.1.1 P	POST-PRODUCTION	108	5 Hrs.	50	50	100
2	AG 4.1.2 P	GAME ENGINE – II	108	15 Hrs.	50	50	100
3	AG 4.1.3 P	CONSOLE GAME DEVELOPMENT	108	15 Hrs.	50	50	100
4	AG 4.1.4 P	GAME DEVELOPMENT FOR MOBILE	108	15 Hrs.	50	50	100
5	AG 4.1.5 P	VIRTUAL REALITY	108	10 Hrs.	50	50	100
Total :			540		250	250	500

Year 4 | Semester 2

No	Subject Code	Name of the Subject	Teaching Hours	Exam Duration	Internal Evaluation	End Exam Marks	Total
1	AG 4.2.1 P	VIVA-VOCE	NA	Evaluation	50	50	300
2	AG 4.2.2 P	FINAL PROJECT	540	5 Hrs.	150	150	300
3	AG 4.2.3 T	THESIS	NA	Submission	50	50	100
Total :			540		250	250	500

Grand Total :			4320		2000	2000	4000
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Year 1 | Semester 1

1. ENGLISH – I	CODE: AG 1.1.1 T
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Unit - I: Travel

- Reading – Heaven’s Gate
- Writing – Paragraphs and descriptions
- Listening – Listening for sounds
- Speaking – Greeting, Taking leave and introducing
- Grammar – Naming words
- Vocabulary - Homonyms, homophones, homographs, Synonyms and antonyms

Unit – II: Biography

- Reading – Sir C. V. Raman
- Writing – Work – related correspondence
- Listening – Listening for words
- Speaking – Making requests
- Grammar – Making naming words specific (Part -1)
- Vocabulary - Word formation

Unit – III: Human Interest

- Reading – The Connoisseur
- Writing – Summarizing
- Listening – Listening for word stress
- Speaking – Apologizing and inviting
- Grammar – Making naming words specific (Part -2)
- Vocabulary - Collocations

2. HISTORY OF ANIMATION	CODE: AG 1.1.2 T
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Unit - I: General Introduction

- Introduction
- All about Syllabus
- Definition of Animation
- What is Animation and it’s essential skills
- Basic principles of Animation

Unit-II: History of Animation

- Appreciation and Introduction to the renowned Animators and their achievements
- Characters and Stories
- Types of Animations : Clay, Sand and Stop-Motion

Unit-III: Animation Production Process-1

- Pre-production
- Production

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- Post-production

Unit-IV: Animation Production Process-2

- Basics of Pre-Production
- Introduction to writing for Animation and plot / story development
- Study of different Animation films
- Study of Scripts and Screenplay
- Introduction to Storyboarding

Unit-V: Storyboarding and Pre-Visualization

- Rough storyboarding and Pre-Visualization
- Creating a simple Animation using stop motion

Reference Books:

- The World History of Animation by Stephen Cavalier
- Of Mice and Magic by Leonard Maltin

The Illusion of Life: Disney Animation By Ollie Johnston

3. DRAWING – I	CODE: AG 1.1.3 P
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Unit - I: Drawing Basic Shapes

- Basic Shapes
- Basic Composition & Light

Unit - II: Masses of Figure Drawing

- Head
- Arms and Legs
- Torso
- Masses of the Figure

Unit - III: Basic Figure Drawing

- The Stick Figure
- The Three Basic Solids
- The Main Line Of Action

Unit - IV: Figure Drawing

- Expressive Gesture
- Quick Action
- Light & Shadow

Unit - V: Animals & Birds Drawing

- Realistic Animals
- Realistic Birds

Reference Book: Basic Drawing Techniques – Greg Albert | Fun with Pencil – Andrew Looms

4. VISUAL COMMUNICATION	CODE: AG 1.1.4 P
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Unit - I: Introduction

- Introduction to Visual Communication
- Introduction to Graphic Design
- Study of Commercial Art

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- Difference between Graphic Design and Commercial Art
- Visual Communication using Graphic Design

Unit - II: Semiotics

- Semiotics – The meaning of signs and symbols, Importance of Semiotics, Designing Semiotics
- Perceiving Visual messages
- Communicative quality of color
- Importance of color in visual communication

Unit - III: Text

- Typography - Study of text
- Different text formats
- Importance of text in visual communication
- Balance of visuals and text in the design

Unit - IV: Designing

- Design Process
- Developing the creative brief
- Design objective
- Concept development
- Idea incubation
- Visualizing the Idea
- Thumbnails
- Layout and design

Reference Software: Adobe Illustrator

5. BASICS MATHEMATICS FOR GAMES
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CODE: AG 1.1.5 T

Unit I - The Cartesian Co-ordinate System

- Cartesian coordinates
- Cylindrical coordinates
- Spherical coordinates
- Generalized coordinates

Unit II - Multiple Co-ordinate spaces

- Multiple co-ordinate spaces
- World space
- Object space
- Camera space
- Inertial space
- Coordinate space transformations

Unit III - Vectors

- Vector properties
- The dot product
- The cross products
- Vector spaces
- Operations on vectors

Unit IV - Matrices and Linear Transformations

- Transforming an object vs transforming an coordinate space
- Rotations

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- Scale
- Orthographic projection
- Reflection
- Shearing
- Rigid body transformations
- Linear transformations
- Quaternions

Unit – V Geometric Primitives

- Lines in 3d space
- Planes in 3d space
- The view frustum
- Perspective -correct interpolation
- Projections

Unit – VI Trigonometry

- Function definitions
- Pythagorean identities
- Exponential identities
- Inverse functions
- Laws of sines and cosines

Year 1 | Semester 2

I. ENGLISH - II	CODE: AG 1.2.1 T
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Unit - 1: Disaster Management

- Reading – The Cuddler Experience
- Writing – Official reports
- Listening – Listening for theme
- Speaking – Congratulating, offering sympathy and condolences and making complaints
- Grammar – Tenses
- Vocabulary - Phrasal verbs

Unit -2: Humor

- Reading – Bubbling Well Road
- Writing – Note making
- Listening – Listening for details and taking notes
- Speaking – Interview skills
- Grammar – Adverbials and modal verbs
- Vocabulary - Idioms

Unit - 3: Films

- Reading – The Odds against Us
- Writing – Information transfer
- Listening – Listening to announcement and directions
- Speaking – Making presentations
- Grammar – Conjunctions and prepositions
- Vocabulary- Technical vocabulary

2. GRAPHIC DESIGNING	CODE: AG 1.2.2 P
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Unit-1: Vector Graphics, Working with Documents

- Understanding vector graphics: RGB vs CMYK
- Working with the Control panel
- Creating files for print
- Creating files for the web
- Managing multiple documents

Unit-II: Advertisement Design

- Invitation design
- Components of effective advertisement design
- Advertisement design

Unit-II: Poster Design

- Poster design consideration
- Brochure design
- Different types of Brochures

Unit-III: Publication Design

- Understanding Publication elements
- Essentials in publication design
- Study of various publication designs
- Making files print ready
- Packaging and exporting for printer friendly formats

Unit-IV: Corporate Identity

- Components of an Identity Program
- Creating a style
- Essence of Corporate Identity Logo
- Choosing color
- Study of changing attitudes of corporate Identity
- Stationary system usage
- Designing Letterhead, Envelope, Business Card

Reference Software: Adobe Illustrator OR Photoshop

3. DRAWING – II

CODE: AG 1.2.3 P

Unit -1 : Figure Drawing with Dress

- Poses
- Weight and Balance

Unit -2 : Still Life

- Composition
- Light and Shade with various materials
- Pencil Rendering
- Colour – Still Life

Unit -3 : Memory Drawing

- Village / City
- Festivals
- Markets etc.

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Unit -4 : Anatomy Study

- Human Muscles
- Animal Muscles

Unit -5 : Basic Clay Modeling

- Basic Shapes
- Human & Animal Parts

Reference Book: Fun with Pencil – Andrew Looms

4. CONCEPT ART

CODE: AG 1.2.4 P

Unit -I : Study of Nature

- Animals & Birds
- Trees & Ponds

Unit -II : Perspective

- 1 point Perspective
- 2 point Perspective
- 3 point Perspective

Unit -III : Pattern Design

- Basic Pattern
- Borders

Unit -IV : Basic Live Sketching

- Outdoor Study
- Field Sketches (Pencil and Pen)

Unit -V : Objective Drawing

- Things
- Basic Models

Reference Book: Sketching Outdoors (Lenard Richmond)

5. BASIC PHYSICS FOR GAMES

CODE: AG 1.2.5 T

Unit – I Basic Newtonian Mechanics

- Newton's laws of Motion
- Units and measures
- Coordinate system
- Vectors
- Derivatives and integrals
- Mass, center of mass

Unit – II Basic Kinematics

- Velocity & Acceleration
- 2d particle kinematics
- 3d particle kinematics
- Kinematic particle Explosion

Unit – III Force

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- Forces
- Force fields
- Friction
- Fluid dynamic drag
- Pressure
- Buoyancy
- Spring and dampers
- Force and torque

Unit – IV Kinetics

- Particle kinetics in 2d
- Particle kinetics in 3d
- Rigid body kinetics

Unit – V Collisions

- Impulse Momentum principle
- Impact
- Linear and angular impulse
- friction

Unit – VI Projectiles

- Simple Trajectories
- Drag
- Magnus Effect
- Variable Mass

Case Study

- Cars & Other Motor Vehicles
- Boats and Things That float
- Airplanes
- Rockets & Missiles
- Impacts & Explosions

Reference Books

- Fundamentals of Math and Physics for Game Programmers by Wendy Stahler
- 3D Math Primer for Graphics and Game Development, 2nd Edition by Fletcher Dunn

Year 2 | Semester 1

I. FUNDAMENTALS OF GAME MODELING	CODE: AG 2.1.1 P
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Unit – I: Modeling Basics

- Understanding object construction in 3D Softwares
- Understanding display engine
- Basic study of Polygons
- Introduction to Polygons and its components

Unit – II: Polygon Modeling - 1

- Revolving

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- Lofting and extruding curves to create surfaces, attaching and detaching surfaces
- Socking
- Stitching surfaces

Unit – III: Polygon Modeling - 2

- Creating polygon primitive objects
- Polygon components
- Editing polygon surfaces
- Combining and separating polygons

Unit – IV: Polygon Modeling - 3

- Splitting and sub-dividing polygons
- Extruding polygons
- Merging vertices
- Bevel
- Extract
- Smooth
- Working with proxy

Reference Software: Maya

2. ESSENTIALS FOR GAME MODELING
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CODE: AG 2.1.2 P

Unit – I: LODs. Modeling in different polycount

- Introduction to Level of detail and low poly modeling
- Building an architecture model in low poly
- Setting up textures and normal maps

Unit – II: Modeling the props in Low poly,

- Setting the scene, Modeling furniture and texture mapping with images
- Detaching surfaces, socking, stitching surfaces optimizing the models
- Modeling Furniture: Couch, Chairs, Table, Palm Tree, Lamp and Carpet, Finishing up and arranging the scene

Unit – III: Terrain Modeling

- Adding detail
- Splitting polygons
- Deleting edges and vertices
- Using soft selection
- Sculpting geometry
- Extruding polygons
- Projecting UV coordinates

Unit – IV: Advanced Terrain Modeling

- Using Mesh Smooth with the Maya software renderer
- opacity maps creating and applying to mesh
- Creating layered maps and displacing the geometry with normal maps.
- Applying 2D procedural textures
- Applying 3D procedural textures

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- Baking textures

Reference Software: Maya

3. TEXTURING and SHADING

CODE: AG 2.1.3 P

Unit 1 Introduction to Shaders

- Study of different shaders
- Understanding the rendering engine
- Basic texturing

Unit 2 Un-wrapping the 3D objects

- Various Projections technics
- Editing the UVs Exporting UV maps and getting ready for texture painting

Unit 3 Painting Textures

- Painting different channels
- Specular
- Diffuse
- Translucence
- Bump

Unit 4 Applying texture maps

- Normal mapping
- Basic rendering of the objects
- Refining and advanced texture study

Reference Software: Autodesk Maya

4. RIGGING

CODE: AG 2.1.4 P

Unit I: Constrains

- Parenting and grouping objects using point, orient, parent constrains
- Creating controllers, set driven keys etc

Unit II: Creating Skeletons

- Creating joints, editing joints, parenting joints, orienting joints
- Creating hierarchical structures and skeletons for biped and quadruped characters

Unit III: Kinematics

- Understanding Forward Kinematics and Inverse Kinematics
- Using IK solvers on skeletons, blending FK and IK
- Creating controllers and adding custom attributes
- Creating facial setups, blend shape deformer

Unit IV: Skinning

- Understanding Rigid Bind and Smooth Bind
- Binding skeletons to characters
- Painting skin weights, editing skin weights using component editor, mirroring skin weights
- Adding influence objects and muscles

Reference Software: Maya

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Unit - I

The Multi-disciplinary nature of environmental studies Definition, scope and importance need for public awareness.

Unit – II: Natural Resources

Renewable and Non-Renewable: Natural Resources and Associated Problems.

Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies.

Land: resources: Land as a resource, and degradation, man Induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles. (8 lectures)

Unit – III: Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids

Introduction, types, characteristic features, structure and function of the following ecosystem:-

- a) Forest ecosystem
- b) Grassland ecosystem
- c) Desert ecosystem
- d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, Estuaries) (6 lectures)

Unit – IV: Biodiversity And Its Conservation

- Introduction — Definition: genetic, species and ecosystem diversity.
- Biogeographically classification of India Value of biodiversity: consumptive use, productive use
- Social, ethical, aesthetic and option values. Biodiversity at global, National and local levels,
- Hot-spots of biodiversity.
- Threats to biodiversity: habit loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India. Conservation of biodiversity: In –sit and Ex- situ conservation of biodiversity.

Unit – V: Environmental Pollution

DEFINITION

- Causes, effects and control measures of:
- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes.

- Role of individual in prevention of pollution.
- Pollution case studies.

Disaster management: floods, earthquake, cyclone and landslides. (8 lectures)

Unit – VI: Social Issues and The Environment

- From Unsustainable to Sustainable development Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns case studies.
- Environmental ethics: Issues and possibility~ solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment protection Act.
- Air (Prevention and Control of Pollution) Act.
- Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act.
- Issues involved in Enforcement of Environmental legislation. Public awareness.

Unit – VII: Human Population and The Environment

- Population growth, variation among nations. Population explosion — Family Welfare Programme
- Environment and Human Health.
- Human Rights.
- Value Education.
- HIV/AIDS.
- Women and child welfare.
- Role of information Technology in Environment and Human Health Case studies (6 lectures)

Unit – VIII: Field Work

- Visit to a local area to document environmental assets-river / forest / grassland / hill / mountain
- Visit to a local polluted site — Urban / rural / industrial / agricultural
- Study of common plants,insects, birds
- Study of simple ecosystems — pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours)

Year 2 – Semester 2

1. DIGITAL PAINTING	CODE: AG 2.2.1 P
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Unit I - Introduction

- Overview
- Brush creation and customization

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- Vector tools

Unit II - Basic Painting

- Painting techniques
- Blending techniques
- Understanding visual language for paintings

Unit III – ‘Normals’ and Projection mapping

- Generating normal maps
- Displacing with normal maps
- Projection mapping techniques

Unit IV - Painting in detail

- Painting the foreground
- Painting the background
- Painting the character
- Adjusting color balance

Reference Software: Autodesk Maya, Adobe Photoshop and Z-Brush

2. DIGITAL SCULPTING	CODE: AG 2.2.2 P
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Unit-1

- Introduction to digital sculpting
- Z-brush overview and interface introduction
- Using a subdivision workflow

Unit-2

- Sculpting basics
- Painting within Z-Brush
- On target display and painting for sculpting

Unit-3

- Dynamic topology
- Mirror brush
- Sculpting with brushes

Unit-4

- Extracting and exporting the sculpted models with maps
- Posing the models
- Integrating sculpted models and maps with game engine

Reference Software:Z-brush

3. SOUND EDITING	CODE: AG 2.2.3 P
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Unit-I: Import, Exporting and Recording Audio

- Importing audio files
- Extracting audio from a CD
- Importing video files
- Recording audio
- Creating a multi-track session

Unit-II: Important Audio Terminology - Cleaning and Repairing Audio

- Understanding the Waveform Editor interface
- Making selections
- Adjusting the clip amplitude
- Fading clips – Normalizing
- Copying, cutting, and pasting
- Undoing, redoing, and using the
- History panel
- Generating silence - Using the Spectral Frequency
- Display - Using the selection tools
- Using the Spot Healing Brush
- Removing background noises

Unit-III: Built-in Effects-Working with the Multi-track Editor and Mixer Panel

- Understanding destructive vs. nondestructive effects
- Applying compression
- Understanding reverb vs. delay
- Working with filters and EQ effects
- Using special effects - Isolating vocals in a stereo track
- Working with time and pitch effects
- Creating a multi-track session
- Recording and importing audio
- Understanding the multi-track interface
- Understanding the Mixer panel
- Editing clips in Multi-track View
- Grouping clips together
- Exporting the mix
- Exporting the session
- Burning the mix to a CD

Unit-IV:

- Working with audio from video
- Importing a sequence from Editing software
- Adding a soundtrack to a video
- Exporting a session back to Editing software

Unit- V: Video Surround Mixing

- Using Automatic Speech Alignment
- Understanding the interface
- Using pan envelopes
- Exporting a multichannel mix

Reference Software: Sonic Foundry SoundForge

4. CHARACTER ANIMATION

CODE: AG 2.2.4 P

Unit – I: ANIMATION TECHNIQUES

- Learning animation tools
- Motion path animation
- Ghosting, play blasting, setting key frames
- Copying and pasting key frames
- Graph editor, tangents

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- Dope sheet, playback speed

Unit – II: ANIMATING CHARACTERS

- Creating bouncing ball Animation, pendulum animation etc
- Creating important story telling poses, pose to pose vs. straight ahead animation
- Line of action, extremes and breakdowns
- Walk cycles, progressive walk, adding attitude in walks

Unit – III: BODY MECHANICS

- Animating small actions to familiarize body weight, volume, gravity etc
- Lifting heavy objects, pushing and pulling objects,
- Character interaction with objects

Software :Maya

5. PRE-PRODUCTION	CODE: AG 2.2.5 P
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Unit -1 : Pre-Production - 1

- Character Turnaround
- Character Lip Sync Chart

Unit -2 : Pre-Production - 2

- Character Attitudes
- Character Size Comparison

Unit -3 : Pre-Production - 3

- Rule of Thirds, Foreground, Middle Ground and Background
- Short Angles
- Building The Storyboard

Unit -4 : Live Sketching

- Quality of pencil strokes
- Character and manner of grouping of strokes

Unit -5 : Claymation

- Modeling basic shapes
- Posing basic shapes
- Animating the poses and filming

Reference Book: The art of storyboard – John Hart | Pencil Sketching by George W. Koch

Year 3 – Semester 1

1. GAME PSYCHOLOGY	CODE: AG 3.1.1 T
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Unit - I Introduction

Unit – II Benefits of Game

- Cognitive benefits of video game play
- Motivational benefits
- Emotional benefits

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- Social benefits
- Games in Health & Education
- Challenges & Future Research
- Implications for Mental Health Intervention

Unit -III The Psychology of Massively Multi-User Online Role-Playing Games:

- Details of MMORPGs
- Collaboration in MMORPGs
- Existing Literature on MMORPGs
- Time Investment
- Emotional Investment
- Motivations
- Relationships
- Role Exploration and Skill Transfer
- Online Environments as Potential Social Science Research Platforms

Unit- IV The Impact of Video Games

- Pain Management
- Coordination and spatial cognition
- Pro Social behavior
- Video game addiction
- Attention deficits
- Increased addiction
- Fictitious violence versus real violence
- Meta-Analysis

Reference Books

- The Proteus Paradox: by Nick Yee
- Hooked: How to Build Habit-Forming Products by NirEyal and Ryan Hoover
- Glued to Games: How Video Games Draw Us In and Hold Us Spellbound by Scott Rigby and Richard Ryan

2. STORY TELLING FOR GAMES

CODE: AG 3.1.2T

Unit I - Introduction

- Modes of story telling
- Characteristics of game stories
- Ancestry of interactive fiction
- Generating believable stories

Unit II - Components of Game Narratives

- Inputs
- Outputs
- Character and related types

Unit III - Game Spaces and Narrative Architecture

- Evocative spaces
- Enacting stories
- Embedded narratives
- Emergent narratives

Unit IV - Constructing the Story

- The Hero's Journey

- The Detailed Journey
- Character Roles

Unit V Project

- Case study
- Related work
- Interactive story telling
- Conclusion

Reference Books

- Character Development and Storytelling for Games by Lee Sheldon Video
- Game Storytelling by Evan Skolnick
- The Ultimate Guide to Video Game Writing and Design by Flint Dille John ZuurPlatten
- The Game Maker's Apprentice by Jacob Habgood

3. GAME DEVELOPMENT FOR WEB

CODE: AG 3.1.3P

Unit I - Introduction to HTML5

- Introduction to HTML5 and CSS3
- Working with CSS3-1
- CSS3 Animations

Unit II - HTML 5API

- Canvas drawing Methods
- Canvas animation
- Drag and Drop
- Geo-location

Unit III - Web-GL

- WebGL introduction
- Triangles and Squares
- Adding color
- Movement
- 3d objects
- Introduction to textures
- Keyboard input
- Improving code with moving objects

Reference Software:HTML5 and WebGL

Reference Books

- Learning HTML5 Game Programming by James L. Williams
- Programming 3D Applications with HTML5 and WebGL by Tony Parisi

4. BASICS OF GAME PROGRAMMING

CODE: AG 3.1.4 T

Unit – I: Overview, Structure & Data types

- Algorithms and Flow charts
- Overview of JS language
- Programming fundamentals
- Statements and expressions
- Understanding data types

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Unit – II: Variable, Basic programming constructs

- Appropriate Variable names
- Declare variables
- Simple assignment statements
- Arithmetic operators
- Relational operators
- Logical operators

Unit – III: Functions, Decisions and Branching

- Functional programming
- Variable to functions
- Working with recursion
- If statement, if else statement, Create the Promo of a film

Unit –IV: Loops and Arrays

- Executive statements for loops
- While loops
- Breaking out loops
- Declaring arrays
- Initializing arrays
- Two dimensional arrays

Unit- V: String Class and Math Functions

- Properties of String Class
- Methods of string class
- Methods of Math class (random/cos/sin/tan/sqrt..)

Unit -VII JavaScript core classes and Project

- Window & document
- Screen
- Location
- Navigator
- Developing puzzle games
- Developing maze games

Reference Software:JavaScript

Reference Books

- Building JavaScript Games by ArjanEgges
- Physics for JavaScript Games, Animation, and Simulations by DevRamtal, Adrian Dobre

5. CONCEPT ART FOR GAMES

CODE: AG 3.1.5 P

Unit-I:Introduction

- Understand the purpose of concept art for computer games
- Background and purpose
- Explore potential drawing media

Unit-II: Working Process

- Structure and outline
- Development of art guide
- Be able to draw anatomy, environment and object concept art for computer games

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Unit-III:Analysis

- Project outline
- Choice of layout

Unit-IV Conclusion

- The artwork
- The art guide
- The challenges

Reference Books

- Big Bad World of Concept Art for Video Games: An Insider's Guide for Students by Elliott J Lilly
- The Art of Game Design: A Deck of Lenses by Jesse Schell
- Concept to 3D Art for the Game Designer by Dwayne Ferguson
- Drawing Basics and Video Game Art by Chris SolarSKI

Year 3 – Semester 2

I. PRE-PRODUCTION FOR GAMES

CODE: AG 3.2.1 P

Unit-I: Prototype for games

- Generating Ideas
- Paper Prototyping
- Digital Prototyping
- Tools for prototyping
- Iteration and Rapid Prototyping

Unit-II: Pre-production on Game Concept

- High concept
- Pitch
- Concept

Reference Books:Game Production Handbook by by Heather M Chandler

2. GAME ENGINE I

CODE: AG 3.2.2 P

Unit-I: Workflow

- Editor
- Hierarchy
- Inspector
- Project
- Preview
- Publish

Unit-II: Assets

- Standard assets
- Importing assets
- Organizing assets
- Meshes
- Animation
- Materials
- Components

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Unit-III: Scripting

- Adding basic interactivity
- Navigation
- Coroutines
- State mechanics

Unit-IV:Camera

- Perspective camera
- Orthographic camera
- Camera control

Unit-V:Physics

- Colliders
- Rigid bodies
- Compound colliders
- Kinematic bodies
- Physics material
- Triggers
- Unit-vi:gui
- Gui-text
- Gui-texture

Reference Software:Unity3d

Reference Books

- Unity Game Development Scripting by Kyle D'Aoust
- Learning Unity3d Programming with UnityScript by Janine Suvak

3. LEVEL DESIGNING

CODE: AG 3.2.3 P

Unit – I: Ergonomics and Level flow | Identifying possible frustrations in level
Level flow:Keeping the player moving forward

Unit - II **Rhythm:** Expectations and surprises
Difficulty: How to manage it
Wow Factor: What it is, how to get it

Unit - III Structure | The Hero's Journey, Story and level design structure according to the mono myth (The Hero's Journey)

Unit – IV **Level Editors:** Introduction to level editors: Never winter Nights Toolset, UDK, Unity3D.

Unit - V **Level Building:** First playable level created in Never winter Nights, Visual level in UDK, Level design group and individual assignment.

Reference Software:Unity3d

Reference Books

- Level Design for Games by Phil Co
- Level Up! The Guide to Great Video Game Design by Scott Rogers

4. ARTIFICIAL INTELLIGENCE FOR GAMES

CODE: AG 3.2.4 P

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Unit-I: Pathfinding&Patrolling

- Quick Path AI
- React AI
- Rain Ai

Unit-II: Behavior Trees

- Overview of behavior trees
- RAIN Node types
- The behavior of tree

Unit-III: Crowd Chaos & Control

- Setting up a scene with React
- Building behavior trees in React
- Setting up wandering characters with React
- Setting up a scene with Fame
- Setting up a group
- Adding obstacles to Fame
- Adding vector fields to Fame
- ANT-Op

Unit -IV: Sensors, Activities and Adaptation

- An overview of sensing
- Advanced visual sensor settings
- Advanced audio sensor settings
- Sensor filters
- Reacting to game events
- Adding large game events

Unit-V: Attacking and Animation

- The chase and attack
- Group attacks
- Animate node
- Mecanim nodes

Unit-VI: AdvancedNav Mesh

- Overview of navigation mesh
- Advanced nav mesh parameters
- Culling areas
- Multiple navigation meshes

Reference Software:Unity3d

Reference Books

- Unity AI Programming Essentials by Curtis Bennett and Dan Violet Sagmiller

5. C# PROGRAMMING

CODE: AG 3.2.5 P

Unit 1: Introduction and Basics of C#

- A brief History
- Machine and Assembly languages
- Intro to .net
- Just In Time Compilation
- Introduction to classes

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- Compiling and Running
- Basic Data Types
- Control Structures

Unit 2: OOPs -1, 2 & 3

- Basics of Structures and Classes
- Inheritance
- Enumerations
- Interfaces
- NameSpaces
- Polymorphism
- Multiple inheritance
- Exceptions
- Delegates
- Collections

Unit 3: Game programming in c#

- Visual c# D3d Framework

Unit 4: Direct 3d

- Defining Vertices
- Colors and Alpha
- Texturing

Unit 5: Direct Input and Sound

- Keyboards
- Mice
- Game Devices
- Joystick
- Sound Device
- Sound Buffers
- Sound Effects

Reference Software:C#

Reference Books

- Beginning c# Game Programming by Ron Penton
- Head First C# by Jennifer Greene and Andrew Stellman

Year 4 – Semester 1

1. POST-PRODUCTION	CODE: AG 4.1.1 P
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Unit-I: Testing

- Identifying bugs
- Alpha version
- Code freeze
- Beta version
- Code release
- Gold master

Unit-II: Reviews

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- Categorizing games and their impacts and outcomes
- Empirical evidence on impacts and outcomes of games
- Focusing on various elements of video games and impact
- Quality analysis

Unit-III:Marketing

- Making demos
- Theoretical trails
- Online Distribution: Opportunities and Challenges

Unit-IV: Maintenance

- Game sequels
- Mmog&mmorpg
- Working with patches

Reference Books

- Head First PMP, 3rd Edition by Jennifer Greene, Andrew Stellman
- Successful Project Management: Applying Best Practices and Real-World Techniques with Microsoft Project by Bonnie Biafore

2. GAME ENGINE – II	CODE: AG 4.1.2P
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Unit – I: Software Engineering for Games

C# best practices, Data, code and memory, Errors, exceptions and assertions

Unit –II: Collision Detection

Collision detection basics, Sphere vs sphere, Axis-aligned bounding boxes, Other collision primitives, Optimization: Broad phase, narrow phase, spatial subdivision

Unit – III: Introduction to Rigid Body Dynamics, Introduction to Game Object Models

Is physics fun?- Point mass linear dynamics- Numerical integration- Survey of collision/physics middleware: ODE, PhysX, Havok- What is a game object model?- World editors- Distinction between offline and runtime object models- Spawners- Basics of game object updating and engine system integration

Unit – IV: Game play Foundation Systems

- Components of the game play foundation layer
- Runtime object model architectures, Memory management and file I/O for level loading
- Streaming game worlds
- Memory management for dynamic objects

Unit – V: Animation System Architecture, Rendering Engine Architecture

- Review of character animation fundamentals
- Blending: LERP and additive
- Procedural animation, IK and other forms of post-processing
- Compression techniques
- Animation system architecture and pipeline
- Interfaces between game characters and animation
- Animation state machines and
- Optimization: the driver of rendering engine architecture
- Primitive submission and render state management
- Sorting, alpha blending and Z pre-pass
- Visibility determination and scene graphs
- Rendering engine architecture

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- Visual effects: Particles, overlays, decals, post processing
- Graphical tools for debugging and development

Unit – VI Digital Physics and Maths

- Touch screens
- Accelerometers
- Geo caching
- Pressure sensors and load cells
- Optical tracking
- Triangle meshes
- 3d math for graphics
- Visibility determination

Reference Software:Unity 3D

3. CONSOLE GAME DEVELOPMENT	CODE: AG 4.1.3P
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Unit - I XNA Game Studio

- Getting Started

Unit - II 2D game Objects

- Sprites and 2D Graphics
- The Game Object and the Default Game Loop

Unit - III 3d game Objects

- Introduction to 3D Graphics
- Lights, Camera, Action!
- Built-In Shader Effects
- States, Blending, and Textures

Unit - IV Navigation and Effects

- Introduction to Custom Effects
- Using the Content Pipeline
- Having Fun with Avatars
- Understanding Performance
- Adding Interactivity with User Input
- Turn Up the Volume
- Storage
- Gamer Services

Unit - V: Final Output

- Multiplayer Networking
- Using Media in XNA Game Studio

Reference Software:XNA

Reference Books

- XNA Game Studio 4.0 Programming by Tom Miller, Dean Johnson
- XNA 3D Primer by Michael C.Neel

4. GAME DEVELOPMENT FOR MOBILE	CODE: AG 4.1.4P
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Unit - I Introduction and Game Elements

- Mobile game
- Mobile game market
- Mobile game tools
- Sprites
- Meshes
- Materials

Unit - II Cameras & Lighting

- Camera effects
- Sky boxes
- Fog
- Lights
- Light maps
- Shadows

Unit -III: Loops, Menus, Navigation

- Scoring
- Collisions
- Level changing
- User inputs

Unit -IV: Path finding

- Nav-mesh
- Revealing players location
- Chasing the player
- Spawning

Unit - V: Specialties of mobile device

- Setting up development environment
- Touch and tilt
- Following the camera

Unit - VI: Sound and Particle Effects

- Audio listener
- Audio source
- Particle system assets

Unit - VII: optimization

- Minimizing the application foot print
- Asset compression
- Player setting
- Tracking performance
- Minimizing the lag

Reference Software:Android

Reference Books

- Game Development Essentials: Mobile Game Developmentby Kimberly Unger
- Beginning Mobile Phone Game Programmingby Michael Morrison
- Professional Html 5 : Mobile Game Development by Pascal Retigg
- Android Game Programming by Example by John Horton

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Unit – I Introduction, Objects and Scale

- What Is Virtual Reality
- Desktop Virtual Reality
- Mobile Virtual Reality
- Difference Between Virtual Reality And Augmented Reality
- Types Of Virtual Reality Experiences
- Creating Simple Diorama
- Measurement Tools

Unit – II VR Build and Run

- VR Device Integration S/W
- Unity Built-In Support
- OSVR Project
- Web Virtual Reality
- 3D Worlds Oculus Rift

Unit – III Gaze-based Control and World Space UI

- Nav-Mesh
- Unity Programming
- Particle Effects
- Visitor Hud
- Reticle Cursor
- WinshieldHud
- An In-Game Dashboard With Input Events
- A Responsive Object UI With Head
- Gestures

Unit – IV First-person Character

- Game Components
- Assets
- Making First Person

Unit – V Physics and the Environment

- Bouncy Balls
- Trampoline And Brick
- Head Shots
- Elevator
- Jumping

Unit – VI walk-throughs, Rendering AND Using all 360 degrees

- Walls
- Ceiling
- 360-degree media
- Crystal balls
- Magic orbs
- Panoramas
- Equi-rectangular projections
- Field of view – FOV
- Capturing a 360-degree media

Unit – VII Social VR Meta-verse

- Multiplayer networking
- Networking services
- Network Manager and HUD
- Running as a host
- Adding multiplayer virtual reality
- Setting up a simple scene
- Building and sharing a custom Virtual Realitychat
- Room

Reference Software:Unity 3D

Reference Books

- Unity Virtual Reality Projects by Jonathan Linowes
- Learning Virtual Reality by Tony Parisi

Year 4 – Semester 2

VIVA VOCE

CODE: AG 4.2.1 P

A viva voce is conducted by one external expert of animation and one internal faculty on the final project and practical experience gained during his/her internship.

FINAL PROJECT

CODE: AG 4.2.2 P

Students has prepare on a final project based on their specialization. The student must take guidance of an Internal Guide and an External guide. The student should select an external guide from any reputed Game company or Post Production studio

THESIS

CODE: AG 4.2.3 P

Submission of a report on any of the topic related to animation under the guidance of the concerned faculty. The presentation should have topic related visuals.