BHARATHIAR UNIVERSITY- COIMBATORE -46
SCHOOL OF DISTANCE EDUCATION (SDE)
M.Sc ANIMATION GAME DESIGN & DEVELOPMENT
Annual Pattern (with effect from 2011 -12 Batch onwards)

Scheme of Examinations

Duration of Exam: Theory – 3 hours practical- 5 hours
Max marks: Theory -25 Practical – 75

First Year

<table>
<thead>
<tr>
<th>S.No</th>
<th>Subject</th>
<th>Theory</th>
<th>Practical</th>
<th>Total Marks</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Advanced Animation Art</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Advanced Digital Image Compositing</td>
<td>25</td>
<td>75</td>
<td>100</td>
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<tr>
<td>3</td>
<td>Advanced Modeling</td>
<td>25</td>
<td>75</td>
<td>100</td>
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<tr>
<td>4</td>
<td>Advanced Texturing</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Advanced Lighting &amp; Cameras</td>
<td>25</td>
<td>75</td>
<td>100</td>
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</table>

Second Year

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>1</td>
<td>Advanced Rigging</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Advanced Animation</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>3D Interactive Intermediate &amp; Advanced Game environment</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Advanced 3D interactive scripting</td>
<td>25</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>3D Game scripting &amp; Virtuols SDK Intermediate</td>
<td>25</td>
<td>75</td>
<td>100</td>
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</tbody>
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TOTAL Marks: 1000
1st YEAR

ADVANCED ANIMATION ART

Unit - I

Advanced man made drawing- linear perspective- color- pencil shade techniques- organic
drawing – perspective – color application- study of Live models – humans- Birds – animal- alien study

Unit - II

Organic drawing and painting - advanced Painting & Color mixing techniques -Still life
Organic drawing, Still life Inorganic drawing & painting.

Unit - III

History of art- Memory Drawing – western History- Indian History- perspective drawing- live
Landscape painting- elevation for buildings-aesthetics theory – western and Indian aesthetics-
traditional color understanding

Unit - IV

Preproduction- importance of character- conceiving characters- designing main characters –

Unit - V

Molding & fabrication- vegetables as characters – models from recycled items-building
models- mixed media – murals – advanced Set designing- finishing

REFERENCE:

Story boarding the Simpsons way - Chris roman
How to Draw Anime & Game Characters - Tadashi Ozawa
Perspective - A Guide for Artists, Architects and Designers - Gwen White
How to draw Portrait Drawing A Step-By-Step Art Instruction Book (2005) - Watson-Guptill
ADVANCED DIGITAL IMAGE COMPOSITING

Unit - I

Interface overview - Color Correction - Layer Blends - Resolution- Masking- Application of all above.

Unit - II

Familiarity with the color tools- contrast –levels-brightness - contrast under image menu - Match color- Duotone-Replace Color-Hue & Saturation- Retouching (intermediate) – change replace and match BG and color

Unit - III

Blends styles (intermediate)- create layers- name the layers- arranging works in separate layers while working on a project/design - change layer styles Using the Styles Panel- handling pen tool

Unit - IV


Unit - V


REFERENCE:

Photoshop book for Digital Photographers - Scott Kelby
ADVANCED MODELING

Unit – I (MODELING FUNDAMENTALS)

Introduction to modeling, - Maya Interface, Maya Tools for modeling - Nurbs modeling - Surface and polygon formation requirements - Space Ship Modeling.

Unit – II (INTERMEDIATE MODELING)

Introduction to Curve tools - Car Modeling - Guitar Modeling - Sword Modeling - Nurbs to Polygon-Structure Detail- Nurbs component – Fine tuning Car Model.

Unit - III

Interior Modeling - Detail work flow on polygon items-Polygon Tools Split Polygon Tool,-Insert Edge Tool-Cutface Tool-Extrude face/edge-Create models like Sofa, chair, Lights, Screen etc

Unit – IV (ADVANCE MODELING)

High Poly Modeling - Helmet Model - Advance character model – Human Anatomy - Mesh flow-Muscular Study - Detail Mesh flow-Muscle Study Leg, Leg Fingers-Extrude-Shape formation-Detail

UNIT V

Detail Face Model -Mesh flow-Muscle Study for face -Extrude-Shape formation-Detail - Refine Mesh flow-Final Detailing of Character-Loop check for Rigging and Animation.

REFERENCE

Stop Staring: Facial Modeling and Animation Done Right - Jason Osipa
Texturing and Modeling : A Procedural Approach - David S. Ebert, F
ADVANCED TEXTURING

UNIT - I (FUNDAMENTALS)
Unwrapping - Maya Maps - Projection methods - Utilizing the UV texture editor & interactive editing its positions in view port & its main attributes to control mapping areas over objects.

UNIT – II (INTERMEDIATE LEVEL)
UV map coordination - UV Texture layout - Merging UV’s – UV uniformities - Stretching UVs to fit in grid - aligning uv’s in grid.

UNIT - III

UNIT – IV (ADVANCE LEVEL)
Texture Utilities - General utilities- Color utilities(Photoshop) - Render node utilities - Switch utilities - tuning output results

UNIT - V
Generating texture without editing the attributes - double side texturing, mixing 3 or more colors & taking output – Shading workflow.

REFERENCE
Advanced Maya Texturing and Lighting with CDROM - Lee Lanier, Wiley Publishing
Texturing and Modeling : A Procedural Approach - David S. Ebert
ADVANCED LIGHTING & CAMERAS

UNIT – I (FUNDAMENTALS)
Light Theory - Maya lights - Spot lights - on stage - in motion pictures- Directional lights- Ambient lights - Point lights - Area lights – Volume light – Light properties and palettes.

UNIT – II (INTERMEDIATE LEVEL)
Concepts of light rigging - 3point lighting concepts – Three point lighting in film & animation industry - Still photography – computer generated imagery- Effective use of key light- Fill light - Back light

UNIT – III (ADVANCE LEVEL)

UNIT - IV
Advanced Techniques (Physical sun & sky, HDRI) & Generating various passes (ambient, occlusion, diffuse, etc.,) HDRI - Definition & its applications

UNIT - V
What are cameras- How to use different types of cameras available in maya.- Camera & Aim- Zoom , Pan , focus – lenses and filters – effective blocking techniques- Maintaining shot continuity

REFERENCE
Advanced Maya Texturing and Lighting with CDROM - Lee Lanier, Wiley Publishing
Essential CG Lighting Techniques - Darren Brooker
II YEAR
ADVANCED RIGGING

Unit – I (FUNDAMENTALS)
Rigging Concepts – Rigging Tools – Techniques - Rigging for animating a mechanical character - Brief description about importance of rigging a character or an object - Constraints

Unit – II (INTERMEDIATE LEVEL)
Robot Rigging – Analyzing mesh flow - Joints - Orientation axis - Ik Handles creation - Grouping - Attributes Creation – Controls creation – Parenting – Fine Tuning

Unit – III

Unit – IV (ADVANCED LEVEL)
High poly rig - Biped Rigging (Character Rigging) – Analyzing Mesh Flow - Joints Creation - IK Attributes creation - FIKIK Switching - Controls creation - Skinning - Skinning Tools & Techniques - Binding - Fine Tuning.

Unit - V

REFERENCE
An Essential introduction to Maya Character Rigging - Cheryl Cabrera
ADVANCED ANIMATION

Unit – I (FUNDAMENTALS)
Principle of Animation - Tools & Techniques - Graph Editor - Dope Sheet - Trax Editor - Linear - Non Linear – Pendulum Animation

Unit – II (INTERMEDIATE LEVEL)
Ball Bounce Animation - Primary Animation - Stretch & Squash Animation - Fine Tuning Animation - Obstacle Ball Bounce Animation - Ball concept animation
Character Walk Animation - Understanding Walk Animation – Normal Walk - Cartoonic Walk Styles - Acting - Blocking - Primary – Secondary - Fine Tuning

Unit – III (ADVANCE LEVEL)
Character Run Animation - Understanding Run Animation - Normal Run - Cartoonic Run Styles - Acting - Blocking - Primary Animation - Secondary Animation - Fine Tuning

Unit - IV
Jump Animation - Acting - Blocking - Primary Animation - Secondary Animation - Fine Tuning Jump Animation – Dive Animation - Fine Tuning Dive Animation

Unit – V

REFERENCE
Animation The Mechanics of Motion - Chris Webster
Understanding Animation - Paul Wells
Timing for Animation - Harold Whitaker, John Halas
Maya Studio Projects: Dynamics - Todd Palaman
3D INTERACTIVE INTERMEDIATE & ADVANCED GAME ENVIRONMENT

Unit - I

3d interactive world - virtools process loop- processing behaviours – rendering- behaviours and scripts- exporting import platforms- Game Tool interface - building blocks– attributes manager – hierarchy manager panel- path manager –schematic view

Unit – II


Unit - III

Character study-Importing & controlling character (intermediate)- unlimited controller – primary and secondary animations- sharing animations - character movement and collision theory- advanced collision using collision detection- triggering events.

Unit IV

Understanding cameras - setting Camera Tracking- cameras and lenses - basic- Fx- montage- movement- dolly- setting as active camera – getting current camera - static and moving cameras.

Unit V

Advanced skin, hair, fur cloth Texturing- advanced shadows settings- planar shadows-projected shadows-advanced virtools grids- movements and interpolation- simulating textures.

REFERENCE

Building Interactive Worlds in 3D: Virtual Sets and Pre-visualization for Games, Film & the Web - Jean-Marc Gauthier
ADVANCED 3D INTERACTIVE SCRIPTING

Unit – I

Intermediate Text functions -displaying 2d text-displaying 3d text-displaying text messages in game dialogues, Creating a two character dialogue

Unit - II

Creating new light and positions, adding wait run attack- Sound Effects- adding layer slider BB- adding object collision box –creating level script- creating 3D positional sounds

Unit - III

Particle interactors and deflectors- creating new 3D frame- creating script for particle emitter-setting parameters – adding attributes- setting speed, bounce, variance –adding bezier progression BB – set position BB – setting maget strength – preview & fine tuning

Unit IV

Lights configuration parameters- Types of lights- adjusting its properties – advanced light target settings- influence, range – attenuation control - lens flare- setting advanced light range

Unit V

Testing lens flare with camera movement- advanced settings in creating fog- picture in picture - motion blur-glowing trail-mesh explosion-Testing wave motion with water fall

REFERENCE

Building Interactive Worlds in 3D: Virtual Sets and Pre-visualization for Games, Film & the Web - Jean-Marc Gauthier

Game Coding Complete, Third Edition [Paperback] - Mike (Mike McShaffry) McShaffry (Author)
3D GAME SCRIPTING & VIRTOOLS SDK INTERMEDIATE

Unit - I
Creating statistics for characters using an array- using get Row BB – creating 2D frames, sizes and texture- linking set texture with Out Pout BB- preview and fine tuning.

Unit – II
Creating a data switch – adding set cell – creating new array- setting target to interface- connecting script to data for interactivity- preview and fine tuning.

Unit - III
Creating an event driven game- the “win” condition- 18 point process – preview and fine tuning - 3D XML import options- mess cutting mode- interface insertion mode – normal processing mode – material override mode- changing 3D XML variable parameters.

Unit - IV

Unit - V
Origin of shaders- state – vertex shader instructions- pixel shader instructions- shader languages - using existing shaders- writing complex shader

REFERENCE
Virtools Fundamentals - Daniel Liu & Shaun Le Lacheur Sales (Author),
Game Coding Complete, Third Edition [Paperback] - Mike (Mike McShaffry) McShaffry (Author)