

UNIVERSITY OF PUNE

B. Sc. Animation

Job Opportunities for B.Sc. (Animation) graduates are available in following domains –

1. Film
2. Multimedia
3. Animation Studios
4. Graphic Media
5. Advertisement Industry
6. Software Engineering
7. Programming
8. Web Development
9. Web Design
10. Graphics and Animation
11. Game Development
12. Game Testing
13. E-Commerce & E-Business
14. E-Services
15. E-Learning
16. Cyber Security
17. Teaching in School and Colleges
18. Training

Self-Employment Opportunities for B.Sc. (Animation) graduates are available in following domains –

1. Web Development
2. Graphics and Animation
3. Independent Film Making
4. E-Commerce, E-Business and E-Governance portal development
5. E-Services like E-learning
6. Cyber Security
7. Freelance Animators

Types of Jobs for B.Sc. (Animation) graduates available are as follows:

1. 3D Modeler
2. Animator
3. Art Director
4. Film and Video Editor
5. Flash Animator
6. Graphic Designer
7. Stop Motion Animator

8. Video Game Designer
9. Animation Director
10. Background Painter
11. Cartoonist
12. Character Animator
13. Character Rigger
14. Color Key Artist
15. Compositing Artist
16. Concept Artist
17. Digital Painter
18. Director
19. Effects Animator
20. Forensic Animator
21. Inbetweener
22. Independent Filmmaker
23. Key Animator
24. Lighting Technician
25. Mathematical Modeler
26. Render Wrangler
27. Storyboard Artist
28. Texture Artist
29. Visual Development Artist

Further Educational / Training / Professional opportunities with/after B.Sc. (Animation) graduates:

Master Degree in Specialized Arts, Microsoft Certification in various Technologies, Certification in Web Development, Masters in Advance Film Making, Cyber Security Certification, Master Degree in Gaming Technologies.

UNIVERSITY OF PUNE

SYLLABUS STRUCTURE

Third Year B. Sc. Animation

Semester – III

Theory Course :

	Subject Code
1. Script Writing	[AN 3101]
2. Introduction to Action Script	[AN 3102]
3. Gaming Technology	[AN 3103]
4. Digital Editing and Motion Graphics – I	[AN 3104]
5. Color Theory and Visual Design	[AN 3105]
6. Advanced 3D Animation – I	[AN 3106]

Practical Course :

7. Practical Course Paper- I based on Theory Paper- II, III.	[AN 3107]
8. Practical Course Paper- II based on Theory Paper- IV, VI.	[AN 3108]
9. Practical Course Paper- I based on Project-I, Showreel-I.	[AN 3109]

Third Year B. Sc. Animation

Semester – IV

Theory Course :

	Subject Code
1. Web Technology	[AN 3201]
2. Intellectual Property Rights & Cyber Security	[AN 3202]
3. Gaming Production	[AN 3203]
4. Digital Editing and Motion Graphics – II	[AN 3204]
5. Visual Effects	[AN 3205]
6. Advanced 3D Animation – II	[AN 3206]

Practical Course :

7. Practical Course Paper- I based on Theory Paper- I, III.	[AN 3207]
8. Practical Course Paper- II based on Theory Paper- V, VI.	[AN 3208]
9. Practical Course Paper- I based on Project-II, Showreel-II.	[AN 3209]

UNIVERSITY OF PUNE
Third Year B. Sc. Animation
Semester – III

Script Writing [AN 3101]

Unit 1

- I. History/Evolution of Animation (3)**
 - a. Beginnings
 - b. Mainstream Animation
 - c. Independent Animation
 - d. Globalization of Animation

- II. Genres and Categories (4)**
 - a) Action-Adventure
 - b) Action Comedy
 - c) Anime
 - d) Comedy
 - e) Dramatic
 - f) Educational
 - g) Musical
 - h) Preschool
 - i) Sci-fi
 - j) Sitcom
 - k) Squash and Stretch.

- III. How to Research and Analyze. (2)**
 - a) Blogging your ideas.
 - b) Reader Response Analysis
 - c) Tracking creation of new styles of animation.
 - d) Making your own Style.

Unit 2

- I. Finding Ideas (3)**
 - a. Origin of Ideas.
 - b. Observation: Take look around.
 - c. Research and Brainstorm.
 - d. People places and things.
 - e. Plotting and evaluating your ideas.

- II. Basic Animation Writing Structure (3)**
 - a) Differences in Story Structure
 - b) Basic Structure
 - c) Creating the Story
 - d) Story Theme
- III. Storyboard for Writers (4)**
 - a) Television and Other Small-Screen Storyboarding
 - b) Television Storyboard Considerations
 - c) Boarding a Script
 - d) Characters
 - e) Locations
 - f) Composition and Drawing
 - g) Time and Space
 - h) Thinking Like a Camera Sees
 - i) Transitions and Hookups
 - j) Visual Storytelling
 - k) Dialogue
 - l) Using the Medium
 - m) The Opening, Timing, Format and Labeling for Boards.
- IV. Script and Animation Terminology (2)**
- V. Dialogue (4)**
 - a) The Purpose of Dialogue
 - b) Revealing Character
 - c) Moving the Story Along with Dialogue
 - d) Conflict Can Reveal Information
 - e) The Mood of the Story
 - f) Characteristics of Dialogue
 - g) Writing the Dialogue
 - h) Problems with Dialogue
 - i) The Rewrite
- VI. The Script Process and Format. (2)**
 - a) Animation Writer as a Visual Director
 - b) Working with a Television Story Editor
 - c) Format
 - d) The First Draft
- VII. Editing and Rewriting (3)**
 - a) New Perspective
 - b) The First Rewrite
 - c) The Second Rewrite
 - d) The Polish
 - e) To the Development Executives Working with a Writer

Unit 3

- I. The Differences between Live action and Animation Scripts. (3)**
- a) Calling Out the Shots
 - b) Dialogue and the Lip-Synch Factor
 - c) Script Length
 - d) Working Out Act Breaks
 - e) The 3-D Script vs. the 2-D Script
 - f) Restrictions Breed Creativity
 - g) Other Things You May Be Expected to Do

Unit 4

- I. Scriptwriting Software (2)**
- II. The Animated Feature Film (4)**
- a) Concerns in Green lighting an Animated Feature
 - b) The Feature Script and Pre-production
 - c) The Direct-to-Video or DVD Feature
 - d) The Television Feature
 - e) Feature Financing and Distribution
 - f) The Structure Needed for a Feature Audience
 - g) Selling an Original Feature
 - h) Films Globally
- III. Beyond the Basics Advice, Tips, and Tricks (4)**
- a) Keep Your Story Editor Happy
 - b) Be Kind to the Storyboard Artist
 - c) Present Tense and “-ing” Words
 - d) Verboten Words
 - e) Imitable Behavior
 - f) Slang and Fantasy Language
 - g) Dialect
 - h) The Other Translation Problem
 - i) Getting Around the Lip-Synch Problem
 - j) Capitalizing Character Names
 - k) Be updated with latest Internet technology
- IV. Pitching your work. (3)**
- a) Do Your Homework
 - b) Rehearse
 - c) Coming In for the Pitch

- d) The Pitch
- e) After the Pitch
- f) Other Pitching and Selling Opportunities
- g) Student Projects

V. Agents, Networking, and Finding Work (2)

- a) Writing a Sample Script
- b) Looking for Work
- c) Agents and Managers
- d) Other Suggestions

Books:

- The Screenwriter's Bible: A Complete Guide to Writing, Formatting, and Selling Your Script
Author: David Trottier. **ISBN:** 9781935247029
- Developing Characters for Script Writing, **Author:** Rib Davis, **Publisher:** A&C Black (2004),
ISBN: 9780713669503

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Third Year B. Sc. Animation
Semester – III

Introduction to Action Script [AN 3102]

Unit I

- 1. Introduction to interactive design mediums** (24)
 - 1.1 User Interface assets design
2. Functions, methods, and parameters
3. Comments
4. Communicating with symbol instances
5. Instance properties and methods
6. Dynamic and input text;
7. Custom functions;
8. Variables
9. Data types
10. Events
11. Button event handling
12. Object-oriented programming concepts
13. Class based Action Script
14. Project: Building a simple mini-site

Unit II

(24)

1. Conditional statements
2. Arrays
3. Objects
4. Looping
5. Math
6. Advanced OOP concepts
7. Working with Display objects
8. Other classes and libraries.
9. Loading symbols from the Library
10. Loading external images and swfs
11. Creating a preloader using Events
12. Projects: Creating a quiz game, Enhancing mini-site / quiz, Creating a dynamic slideshow

Reference Books:

- ActionScript 3.0 Visual Quick Start Guide *, by Derrick Ypenburg
- Essential ActionScript 3.0, by Colin Moock
- Learning ActionScript 3.0, by Rich Shupe and Zevan Rosser

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Third Year B. Sc. Animation
Semester – III

Gaming Technology [AN 3103]

Unit I **(12)**

1. Origin and growth of gaming industry
2. Gaming: meaning and defining
3. Gaming as modern entertainment

Practical

1. Generating innovative ideas for gaming
2. Preparing proposal for the new game
3. Creating new game characters
4. Designing various levels of game

Unit II **(12)**

1. Classification of gaming
2. Game production cycle
3. Pre-production – concept and idea
4. Production requirements and planning
5. Modeling and Animations, Interiors - More complex UV mapping, Programmatic Movement.

Practical

- Working on a gaming project
- Drawing the work flow chart
- Designing and choosing background
- Working on the gaming software

Unit III **(12)**

1. Production – plan implementation,
2. Tracking progress and plan testing
3. Post production – archive and plan for future games

Practical

1. Voice over: planning, choosing studio, casting actors,
2. Recording voice over
3. Music selection for background
4. Working with a music composer

Unit IV

(12)

1. Structure and functioning of gaming company:
2. Production, art, engineering, designing,
3. Quality assurance testing
4. Game production team members and responsibilities

Reference Books :

- **The Art of Game Design: A Book of Lenses**
by [Jesse Schell](#)
Publisher: CRC Press (12 September 2008)
Language: English
ISBN-10: 0123694965
ISBN-13: 978-0123694966
- **Game Mechanics: Advanced Game Design (Voices That Matter) [Import] [Paperback]**
[Ernest Adams](#) (Author), [Joris Dormans](#) (Author)
Publisher: New Riders; 1 edition (15 June 2012)
Language: English
ISBN-10: 0321820274
ISBN-13: 978-0321820273
- **Game Coding Complete, Fourth Edition Paperback**
by [Mike McShaffry](#) (Author), [David Graham](#) (Author)
Publisher: Cengage Learning PTR; 4 edition (March 5, 2012)
Language: English
ISBN-10: 1133776574
ISBN-13: 978-1133776574
- **Game Development Essentials: Game Story & Character Development Paperback**
by [Marianne Krawczyk](#) (Author), [Jeannie Novak](#) (Author)
Publisher: Cengage Learning; 1 edition (March 23, 2006)
Language: English
ISBN-10: 1401878857
ISBN-13: 978-1401878856

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Semester – III

Digital Editing and Motion Graphics – I [AN 3103]

Unit I

(12)

Digital Editing

- The Evolution of Modern Non-Linear Editing
- The Evolution of Digital Non-Linear Editing
- Technological Advances in Editing Methods
- Using Adobe Premiere Pro
- Interface
- Importing Videos
- Editing and adding Effects
- Video Compressions
- Rendering Outputs and Using Encore

Unit II

(20)

A Brief History of Motion Graphics

- Precursors of Animation
- Early Cinematic Inventions
- Experimental Animation
- Motion Graphics in Film Titles
- Motion Graphics in Television

Motion Graphics in Film and Television

- Film Titles
- Network Branding
- Commercials
- Public Service Announcements
- Music Videos

Motion Graphics in interactive Media

- The Interactive Environment
- Motion over the Web
- Motion in Informational Kiosks
- Motion in Multimedia
- Motion in DVD-Video

Motion Graphics in the Environment

- New Technologies
- Immersive Environments
- Animated Exteriors
- Digital Signage
- Performance
- Alternate Spaces

Unit III

(16)

Motion Literacy: Choreographing Movement

- The Language of Motion
- Spatial considerations
- Temporal Considerations
- Coordinating Movement

Images, Live-Action and Type

- Visual Properties
- Image Considerations
- Live-Action Considerations
- Typographic Considerations
- Integrating Images, Live-Action, and Type

Books:

- *Motion Graphic Design: Applied History and Aesthetics.* **Author:** Jon Krasner.
ISBN: 9780240809892. **Publisher:** Focal Press.
- *Premiere Pro CS6 Digital Classroom.* **Author:** Jerron Smith, AGI Creative Team.
ISBN: 9781118553008. **Publisher:** John Wiley & Sons, 2012.

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Semester – III

Color Theory and Visual Design – I [AN 3105]

Unit I

(34)

1. Physiological Colours

- a) Effects of Light and Darkness on the Eye.
- b) Effects of Black and White Objects on the eye.
- c) Grey surfaces and Objects
- d) Dazzling Colourless and Coloured Objects
- e) Faint and Coloured Shadows
- f) Subjective Halos
- g) Pathological Colours

2. Physical Colours

- a) Dioptrical Colours
- b) Subjective Experiments
- c) Refraction Without Colour
- d) Condition for Appearance of Colour Increases and decreases
- e) Grey and Coloured Objects displayed by refraction
- f) Achromatism and Hyperchromatism
- g) Advantages of Subjective Experiments.
- h) Objective Experiments
- i) Refraction Without Colour
- j) Condition for Appearance of Colour Increases and decreases
- k) Grey and Coloured Objects displayed by refraction
- l) Achromatism and Hyperchromatism
- m) Combination of Subjective and Objective Experiments.
- n) Transition
- o) Catoptrical colours
- p) Paroptical colours
- q) Eoptical colours

3. Chemical Colours

- a) Chemical Contrast
- b) Black and White
- c) First excitation of colours
- d) Augmentation of colour
- e) Culmination
- f) Fluctuation
- g) Passage through the whole scale
- h) Inversion

- i) Fixation
- j) Intermixture Real and Apparent
- k) Communication Actual and Apparent
- l) Extraction
- m) Nomenclature
- n) Minerals and Plants
- o) Worms, Insects, Fishes and Birds
- p) Mammalia and Human Beings
- q) Physical and Chemical effects of the transmission of light through coloured medium.
- r) Chemical effect of Dioptrical Achromatism

4. General Characteristics

- a) The facility with which colour Appears
- b) The definite nature of Colours
- c) Combination of the two Principles
- d) Augmentation to Red
- e) Junction of the two augmented Extremes
- f) Completeness and its Harmony
- g) The facility with which colour may be tend either to the Plus or Minus Side
- h) Evanescence of Colour
- i) Permanence of colour

5. Relation to Other Pursuits

- a) Relation to Philosophy
- b) Relation to Mathematics
- c) Relation to the technical operation of Dyer
- d) Relation to Physiology and Pathology
- e) Relation to Natural History
- f) Relation to General Physics
- g) Relation to the Theory of Music
- h) Concluding observations on terminology

6. Effect of colour with reference to Moral Association

- a) Yellow, red-yellow, yellow –red.
- b) Blue, red-blue, blue-red
- c) Red, Green
- d) Completeness and Harmony
- e) Characteristic combinations
- f) Yellow and Blue
- g) Yellow and Red
- h) Blue and Red
- i) Yellow-Red and Blue-Red
- j) Combination Non-Characteristic
- k) Relation of the Combination to Light and Dark
- l) Consideration derived from the Evidence of Experience and History
- m) Chiaro-Scuro

- n) Tendency to Colour
- o) Keeping and Colouring
- p) Colour in General Nature
- q) Colour in Particular Objects
- r) Characteristic Colouring
- s) Harmonious Colouring
- t) Genuine Tone and False tone
- u) Weak Colouring
- v) The Motley
- w) Dread of Theory
- x) Ultimate Aim
- y) Grounds and Pigments
- z) Allegorical, Symbolical, Mystical Application of Colour
- aa) Concluding Observations

Unit II

(14)

1. **Introduction to Visual Design**
2. **Design Elements and Principles**
3. **Elements of Design**
 - Line
 - Color
 - Attributes
 - Shape
 - Categories
 - Texture
 - Space
 - Form

4. **Principles of design**
 - Unity/Harmony
 - Methods
 - Balance
 - Types
 - Hierarchy
 - Scale/proportion
 - Dominance/emphasis
 - Similarity and contrast

Books:

- Theory of Colours. **Author:** Johann Wolfgang von Goethe (Dover Fine Art, History of Art)
ISBN: 9780486448053
- Colour. **Author:** Rudolf Steiner. **Publisher:** Rudolf Steiner Press (2002). **ISBN:** 9781855840850

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Third Year B. Sc. Animation
Semester – III

Advanced 3D Animation – I [AN 3106]

Unit I

(20)

1. Understanding the Maya Interface

- a) Exploring Interface
- b) Views
- c) Time Slider
- d) Range Slider
- e) Toolbox Window
- f) Shelves
- g) Creating Primitives
- h) Moving Views and Manipulating Objects
- i) Using Maya Windows and Menus
- j) Setting Preferences
- k) Preferences Window

2. Introduction to Animation in Maya

- a) Scene-File Management
- b) Creating and Animating a Bouncing Ball
- c) The Resolution Gate
- d) Setting Movement Key frames
- e) Refining Movement in the Graph Editor
- f) Adjusting Spline Tangents
- g) Breaking Tangents for Fast Direction Changes
- h) Animation Principles
- i) Creating a Playblast of Your Animation

Unit II

(10)

3. Modeling with Polygons

- a) Understanding Polygons
- b) Constructing a Model
- c) The Importance of Quads
- d) The Problem with Ngons
- e) Using the Main Modelling Tools
- f) Setting Up View Planes
- g) Starting with a Cube
- h) Extruding Faces
- i) Box Modelling

4. Modeling a Character

- a) Building a Character
- b) Refining the Character's Geometry
- c) Using the Insert Edge Loop Tool
- d) Using the Split Polygon Tool
- e) Shaping Your Character
- f) Creating Edge Loops
- g) Getting Started: Deleting Edges and Setting Tool Options
- h) Building Your Edge Loops
- i) Adjusting Vertices, Polygons, and Edges, and Adding Details
- j) Creating Eyebrows
- k) Refining and Cleaning Up
- l) Adding Geometry for Deformations
- m) Cleaning Up the Model
- n) Positioning Your Character for Rigging
- o) Adding Eyeballs
- p) Mirroring
- q) Deleting History

5. Surfacing Your Character

- a) Creating a Surface
- b) Hypershade Window
- c) Marking Menu
- d) Laying Out UVs
- e) UV Space
- f) UV Layout
- g) Texture Mapping
- h) Color Map
- i) Applying Your Color Map
- j) Applying Additional Surfaces

6. Blend Shapes

- a) Blend Shapes
- b) Deformer Order
- c) Blend Shapes
- d) Deformers for a Character
- e) Facial Deformers
- f) Facial Blend Shapes
- g) Setting Up the Blend Shape Interface

Books:

- *Introducing Autodesk Maya 2014: Autodesk Official Press. Author: Dariush Derakhshani. ISBN: 9788126543007*
- *Autodesk Maya 2014 Essentials: Autodesk Official Press. Author: Paul Naas. ISBN: 9781118575079*

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Third Year B. Sc. Animation
Semester – IV

Web Technology [AN 3201]

Unit I

(10)

Using Photoshop

- Introduction to Internet
- Understanding Browsers
- Starting with HTML
- HTML Page Structure
- Defining Web Layout(Head & Body)
- Head Tags
- BODY tag with Bgcolor, Background with image and text color.
- Text formatting
- Text attributes
- Importance of heading tags (H1–H6)
- Marquee text with or without background, Blink the text attributes
- Divide section using <HR> line with width, align, size
- Knowing Images format for web
- Working with images
- Images attributes
- Working with Tables
- Table attributes
- Colspan, Rowspan
- Table Border, Align, Valign
- Table background image, color to cell
- Nesting tables
- Using list
- Ordered list
- Unordered list
- Bullets (disc, square, circle)Upper alphbets, lower alphabet, roman upper or lower
- Working with Links
- Internal Links
- External Links
- Anchor Link
- Email Link
- Linking with text
- Links with images
- working with forms
- knowing get and post action
- Radio button, Check box,

- Text box, Drop-down list,
- Use attribute Size, Max-length, Name attributes
- Add Submit and Reset Button

Unit II

(8)

Using CSS

- Introduction to Cascading Style Sheets
- Types of Style Sheets
- (Inline, Internal and External)
- Class Selector
- ID Selector
- Absolute Relative Positioning
- Inline menu
- DIV + CSS Layout Design
- PSD to CSS Conversion

Unit III

(10)

Using Flash

- Understanding animation for web
- Motion tween animation
- Using rotate, alpha effects in animation
- Motion guide animation
- Understanding movie clips
- Working with colors pallete
- Adding sound to animation
- Adding sound to buttons
- Importing images from other softwares
- Creating effective web banners
- Creating web buttons
- Creating web advertisement
- Creating interactive web Presentation

Unit IV

(16)

DreamWeaver

- Exploring Dreamweaver Interface
- Planning & Setting Web Site Structure
- Working with panels
- Understanding and switching views
- Using property inspector
- Formating text
- Creating Web pages
- HyperLinking pages
- External Linking

- Anchor & Email Link
- Inserting Tables
- Merging cells
- Setting table properties
- Working with images
- Understanding jpg and GIF file format
- Image Linking
- Creating rollover images
- Inserting flash swf file in web pages
- Working with forms
- Validating forms
- Creating and working with Templates
- Working with Spry Menu Bar
- Creating Tabbed Panel
- Creating Collapsible panel
- Using Behaviours
- Creating interactive website
- Creating Tableless website using CSS

Gif Animation

- Understanding gif animation interface
- Knowing Gif file format
- Creating basic web banners
- Creating web banners with effects
- Creating animated web buttons

Unit V

(4)

Uploading site

- Learning to use FTP
- Setting FTP
- Uploading of site
- Using Control panel
- SEO (Search Engine Optimization)
- Google Analytics
- XML Sitemap
- Selecting ISP & More

Reference Books :

- Web Technologies, Black Book
Kogent Learning Solutions Inc. (Author)
ISBN-10: 9351192512
ISBN-13: 978-9351192510

Publisher: Dreamtech Press (19 December 2013)

- HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery
Kogent Learning Solutions Inc. (Author)
Publisher: Dreamtech Press (7 July 2011)
Language: English
ISBN-10: 9350040956
ISBN-13: 978-9350040959

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Semester – IV

Intellectual Property Rights and Cyber Security [AN 3202]

Unit 1: Introduction to Intellectual Property Rights (Lectures :8)

Introduction to IPR
Need of Intellectual Property Protection
Introduction to Patents&Copyright
Historyof IPR
The evidence about Intellectual Property
The Background
Redistributive Impact, Growth and Innovation
Trade and Investment
Technology Transfer – Concept, issues and challenges

Unit 2: Introduction to Copyright, Software and Internet (Lectures :6)

Introduction
Copyright as a Stimulus To Creation
Collecting Societies
Copyright-Based Industries and Copying Of Protected Works
Copyright And Access
Educational Materials
Libraries
Copyright and Computer Software
Delivering the Potential of the Internet for Development
Technological Restrictions

Unit 3: The Patent System (Lectures :8)

Introduction
The Design of the Patent System In Developing Countries
Introduction
Scope of Patentability
Patentability Standards
Exceptions to Patent Rights
Providing Safeguards in a Patent Policy
Encouraging Domestic Innovation
The Use of the Patent System in Public Sector Research
Introduction
Evidence from the USA
Evidence from Developing Countries
How the Patent System Might Inhibit Research and Innovation

The Issues in Developed Countries
The Relevance to Developing Countries
Patenting in India
Process of Patenting in India
International Patent Harmonization

Unit 4: Basic Security Concepts

(Lectures : 8)

Overview of Networking Concepts : Basics of Communication Systems, Transmission Media
ISO/OSI and TCP/IP Protocol Stacks, Local Area Networks ,Wide Area Networks, Internetworking
Packet Formats, Wireless Networks, Internet

Basics of Information Security : Information Security Overview, Information Security Services
Types of Attacks , Goals for Security, E-commerce Security, Computer Forensics, Steganography ,
Security Engineering

Security Threats and vulnerabilities: Overview of Security threats, Hacking Techniques, Password
Cracking , Insecure Network connections, Malicious Code ,Programming Bugs, Cybercrime and Cyber
terrorism , Information Warfare and Surveillance

Basics of Cryptography

Introduction to Cryptography, Symmetric key Cryptography , Asymmetric key Cryptography
Message Authentication and Hash functions, Digital Signatures , Public Key infrastructure
Applications of Cryptography

Unit 5: Security Management

(Lectures : 10)

Security Management Practices

Overview of Security Management ,Information Classification Process ,Security Policy
Risk Management , Security Procedures and Guidelines ,Business Continuity Planning(BCP)
Recovery

Security Laws and Standards

Security Assurance, Security Laws , International Standards ,Security Audit , OCTAVE approach
SSE-CMM, Network Security , IT Act 2000 – Key Provisions

Access Control and Intrusion Detection

Overview of Identification and Authorization
Intrusion Detection Systems and Intrusion Prevention Systems

Server Management and Firewalls

User Management, DNS Routing and Load Balancing , Overview of Firewalls
Types of Firewalls , DMZ and firewall features ,

Security for VPN and Next Generation Networks

VPN Security , Security in Multimedia Networks , Link Encryption Devices

System and Application Security

Designing Secure Operating Systems
Controls to enforce security services
Desktop Security , OS security, mobile security, email security, Web Security: web authentication,
SSL and SET

Unit 6: Cases of Security Systems

(Lectures:8)

Cases of Security Systems in e-Banking

Cases of Security Systems in e-Commerce

Cases of Security Systems in e-business

Cases of Security Systems in ICT devices in Business

References:

- Intellectual Property Rights by M.M.Karki , Atlantic Publication (2009)
- Intellectual Property Rights in India : General Issues and Implications by PrankrishnaPal,Regal Publications
- Cyber Security : Understanding Cyber Crimes , Computer Forensics and Legal Perspectives by SunitBelpure and Nina Godbole,Wiley India Pvt. Ltd
- Information Systems Security : Security Management , Metrics , Framework and Best Practices by Nina Godbole,Wiley India Pvt. Ltd
- Introduction to Computer Security, Matt Bishop , Pearson Education
- Information Security : Principals and Practices, Pearson Education

UNIVERSITY OF PUNE
Third Year B. Sc. Animation
Semester – IV

Gaming Production [AN 3203]

- UNIT – I** **(4)**
1. Course Overview and C/Win32 game - full circle games introduction
 2. Game Building and Modeling Introduction.
- UNIT – II** **(10)**
1. Modeling and Animations
 2. Interiors - More complex UV mapping
 3. Programmatic movement.
- UNIT – III** **(12)**
1. Advance C++ techniques - Intro to DirectX 3D - Camera - Meshes – Geometry
 2. Vertices & Indices - Texture and Lighting - Particles - Intro to Networking,
 3. Direct play,
 4. Multiplayer gaming.
- UNIT – IV** **(10)**
1. Introducing Blender 3D – Game Development and Logic Development with Blender 3D
- UNIT – V** **(12)**
- 1 Introduction to Unreal Game engine - Focus on final projects, installers, triggers -
 - 2 Torque internals, physics, Pathing - Torque Script, Data blocks, Agile Programming - Camera
 - 3 Pathing, Camera Control.
 - 4 Android game development.

Reference Books :

- **The Art of Game Design: A Book of Lenses**
by [Jesse Schell](#)
Publisher: CRC Press (12 September 2008)
Language: English
ISBN-10: 0123694965
ISBN-13: 978-0123694966

- **Game Mechanics: Advanced Game Design (Voices That Matter) [Import] [Paperback]**
[Ernest Adams](#) (Author), [Joris Dormans](#) (Author)
Publisher: New Riders; 1 edition (15 June 2012)
Language: English
ISBN-10: 0321820274
ISBN-13: 978-0321820273

- **Game Coding Complete, Fourth Edition Paperback**
by [Mike McShaffry](#) (Author), [David Graham](#) (Author)
Publisher: Cengage Learning PTR; 4 edition (March 5, 2012)
Language: English
ISBN-10: 1133776574
ISBN-13: 978-1133776574

- **Game Development Essentials: Game Story & Character Development Paperback**
by [Marianne Krawczyk](#) (Author), [Jeannie Novak](#) (Author)
Publisher: Cengage Learning; 1 edition (March 23, 2006)
Language: English
ISBN-10: 1401878857
ISBN-13: 978-1401878856

UNIVERSITY OF PUNE
Third Year B. Sc. Animation
Semester – IV

Digital Editing and Motion Graphics - II [AN 3204]

Unit I **(24)**

The Pictorial Composition

- Space and Composition: An Overview
- Principles of Composition
- Constructing Space

The Sequential Composition

- Overview
- Forms of continuity
- Forms of Discontinuity
- Montage

Conceptualization

- Assessment
- Formulation
- Cultivation
- Storyboards
- Animatics

Animation Processes

- Frame-by-frame Animation
- Interpolation
- Spatial Interpolation
- Visual Interpolation
- Temporal Interpolation
- Coordinating Movement

Unit II **(24)**

Motion Graphics Compositing

- Compositing: An Overview
- Blend Operations
- Keying
- Alpha Channels
- Mattes
- Masks
- Nesting
- Color Correction

Motion Graphics Sequencing

- Editing: An Overview
- Cuts
- Transitions
- Mobile Framing
- Establishing Pace
- Establishing Rhythm
- Birth, Life, and Death
- Introduction and Conclusion

Books:

- *Motion Graphic Design: Applied History and Aesthetics.* **Author:** Jon Krasner.
ISBN: 9780240809892. **Publisher:** Focal Press.
- *Premiere Pro CS6 Digital Classroom.* **Author:** Jerron Smith, AGI Creative Team.
ISBN: 9781118553008. **Publisher:** John Wiley & Sons, 2012.

UNIVERSITY OF PUNE
Third Year B. Sc. Animation
Semester – IV

Visual Effects [AN 3205]

Unit I

(18)

- 1. Introduction to Digital Compositing**
 - a) Historical Perspective
 - b) Terminology

- 2. The Digital Representation of Visual Information.**
 - a) Image Generation
 - b) Image Input Devices
 - c) Digital Image File Formats

- 3. Basic Image Manipulation**
 - a) Color Manipulations
 - b) Geometric Transformation

- 4. Basics of Compositing**
 - a) The Matte Image
 - b) Multisource Operators
 - c) Masks
 - d) Compositing with Pre-multiplied Images

Unit II

(18)

- 5. Matte Creation and Manipulation**
 - a) Procedural Matte Extraction
 - b) Matting Techniques

- 6. Image Tracking and Stabilization**
 - a) Tracking and Element Into a Plate
 - b) Manual Manipulation of Tracking curves.
 - c) Stabilizing a Plate
 - d) Tracking Multiple Points

- 7. Interface Interaction**
 - a) The Nuke Window
 - b) Understanding Nodes And The Node Graphs
 - c) The Properties Panel

- d) Other Controls On All Properties Panels
- e) Indicators On Nodes
- f) Viewer Nodes And Viewer Pane
- g) Timeline Controls
- h) Key frame Indication
- i) The Curve Editor Pane
- j) Displaying A Channel Set
- k) Display Gain And Gamma
- l) Viewer Composite Display Modes 26
- m) Region Of Interest (ROI) 28
- n) Customizing Your Layout 29

8. Image Viewing and Analysis

- a) Image Viewers
- b) Flipbooks
- c) Image Statistics

9. Formats, Media, Resolution and Aspect Ratios

- a) Aspect Ratio
- b) Resolution After Aspect Ratio
- c) Film Formats and Conversion
- d) Video Formats
- e) Nonsquare Pixels
- f) Film to Video Conversion.

10. Quality and Efficiency Test

- a) Quality Checking
- b) Efficiency Methods
- c) Minimizing Data Loss
- d) Consolidating Operations
- e) Region of Interest
- f) Working in Networked Environment
- g) Disk Usage
- h) Pre-compositing

11. Display Elements

- a) Colour, Brightness and Contrast
- b) The Camera
- c) Distance and Perspective
- d) Lens Flare
- e) Focus
- f) Motion Blur

12. Creating Elements

- a) Lighting
- b) Reference Stand In
- c) Clean Plates
- d) Film Stock
- e) Filters
- f) Choosing Formats
- g) Lighting and Shooting Blue-screens
- h) Blue Screen vs. Green Screen

13. Advanced Topics

- a) Beyond Black and White
- b) Nonlinear Color Spaces
- c) Working with 3D Elements(Z depth compositing)
- d) Morphing, Digital Painting and Editing

14. Inside Nuke

- a) Color Correction In Nuke
- b) Transformation
- c) Paint
- d) Tracking
- e) 3D Compositing
- f) Temporal Operation
- g) Warping
- h) Stereoscopic Compositing
- i) Rendering

Books:

- Nuke 101: Professional Compositing and Visual Effects by Ron Ganbar. **ISBN: 9780321733474**
- The Art and Science of Digital Compositing, Second Edition: Techniques for Visual Effects, Animation and Motion Graphics (The Morgan Kaufmann Series in Computer Graphics), **ISBN: 9780123706386**

Supported Reading:

- The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures Jeffrey A. Okun (Editor), Susan Zwerman (Editor), **ISBN: 9780240812427**
- Digital Compositing for Film and Video by Steve Wright, **ISBN: 978-0240813097**

UNIVERSITY OF PUNE
Third Year B. Sc. Animation
Semester – IV

Advanced 3D Animation - II [AN 3206]

Unit I

(12)

7. Dem Bones: Setting Up a Joint System

- a) Understanding How Joints Work
- b) Building Joint Chains
- c) Picking the Correct View for a Chain
- d) Starting in the Middle (of the Character)
- e) Naming Joints
- f) Creating the Leg Chain
- g) Creating the Arm Chain
- h) Putting It All Together
- i) Mirroring Joint Chains
- j) Using Variables for Naming
- k) Connecting All Your Chains
- l) Connecting the Joints to Your Model
- m) Using Smooth Bind
- n) Skinning Joints to Your Model
- o) Parenting the Eyes to the Skeleton

8. Weighting Joints

- a) Understanding Joint Weighting
- b) Joint Influence on Deformation
- c) Adjusting Weights
- d) Strategies for Assigning Weights
- e) Paint Skin Weights Tool—Add
- f) Paint Skin Weights Tool—Replace
- g) Painting Your Weights
- h) Mirroring Weights

Unit II

(12)

9. Rigging a Character

- a) Understanding Basic Rigging Concepts
- b) Forward Kinematics
- c) Inverse Kinematics
- d) Setting Up the Leg Controls
- e) Creating Leg IK Chains
- f) Creating an External Control Handle
- g) Connecting the IK Chains to the Handle
- h) Using Pole Vector Constraints for Controlling the Knee
- i) Setting Up the Torso Control
- j) Creating the Torso Control Handle

- k) Connecting the Torso Control
- l) Setting Up the Character Control
- m) Creating the Character Control Handle
- n) Connecting the Character Control Handle
- o) Creating a Custom Shelf

10. Animating Your Character

- a) Setting Up Maya for Animation
- b) Setting Key Tangents
- c) Creating a Camera and Turning on the Resolution Gate
- d) Locking Down the Camera
- e) Animating Your Character
- f) Creating a Pop-Thru
- g) Timing the Pop-Thru
- h) Adding Breakdown Poses
- i) Polishing the Animation

Unit III

(12)

11. Setting the Scene: Creating an Environment

- a) Building a Room
- b) Creating the Floor and Walls
- c) Texturing the Floor and Walls
- d) Building Props
- e) Creating a Table
- f) Creating a Poster

Unit IV

(12)

12. Lighting Your Shot

- a) Understanding the Three-Point Lighting System
- b) Key Light
- c) Fill Light
- d) Rim Light
- e) Using the Maya Lights
- f) Directional Light
- g) Spot Light
- h) Point Light
- i) Lighting Your Scene
- j) Placing Your Lights
- k) Setting the Intensity of Your Lights
- l) Casting Shadows
- m) Performing Light Linking

13. Rendering and Compositing Your Scene

- a) Making 2D Images Out of 3D Scenes
- b) Smoothing Your Model
- c) Setting Your Render Preferences

- d) Running a Batch Render
- e) Finding Your Frames
- f) Performing Compositing
- g) Compositing Your Frames
- h) Using Other Compositing Options

Books:

- *Introducing Autodesk Maya 2014: Autodesk Official Press. **Author:** Dariush Derakhshani. ISBN: 9788126543007*
- *Autodesk Maya 2014 Essentials: Autodesk Official Press. **Author:** Paul Naas. ISBN: 9781118575079*

Guidelines for Showreel / Portfolio (20 Marks)

What is a Showreel / Portfolio ?

A show reel / portfolio is a collection of items organized in a notebook, File, Computer memory devices like CD/DVD or a similar format. By collecting this information throughout college, you can help to recognize the skills and abilities you possess in relationship to a career. This is also an excellent way to showcase your qualifications to an employer for an internship or full time employment following graduation.

Who uses ShowReel / Portfolio?

The concept of using a show reel/ portfolio originated in occupations where creativity is a necessary skill. Employers seeking to hire persons in jobs related to animation, art, Film, publishing, advertising, and journalism often require a show reel/portfolio in the hiring process to demonstrate their work. However, a show reel/portfolio can also help document work experience, achievements and skills in any field. In fact, developing a portfolio during college/course will help you to evaluate yourself and your career decisions. It can help you explore careers which match your interests which are documented in your portfolio. In addition, it can help you to compare your skill level to the level needed for your chosen career. Following completion of college/course, your show reel/portfolio can serve as an invaluable tool for you to demonstrate your skills to a potential employer during an interview.

Sem III

Guidelines to Student

- Show reel should contain student's 1st and 2nd year work.
- Show reel should be in video format.
- Show reel should contain good Background Music matching with video.
- Show reel should acknowledge the institution.
- Show reel should contain credits for Faculty members.
- Show reel should contain the year of study.
- Show reel should contain only Students original works.
- Show reel should have proper title and description if required.
- Show reel should justify your Specialization.

Sem IV

Guidelines to Student

- Show reel should contain student's 3rd year work.
- Show reel should be in video format.
- Show reel should contain good Background Music matching with video.
- Show reel should acknowledge the institution.
- Show reel should contain credits for Faculty members.
- Show reel should contain the period of study
- Show reel should contain only Students original works.
- Show reel should have proper title and description if required.
- Show reel should justify your Specialization.