



Punjab Technical University Jalandhar

Syllabus Scheme
(1st to 6th Semester)
For

B.Sc. in Animation & Film Making
(BSC-AFM)

Applicable from September 2010 & Onwards

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Semester 1

CODE	SUBJECT	PAPER Type
BSCAFM-101	Overview of Animation	Theory
BSCAFM-102	Basic Foundation Art	Theory
BSCAFM-103	Mechanics Of Animation	Theory
BSCAFM-104	Basic Classical Animation	Theory
BSCAFM-105	Communication & Soft Skills	Theory
BSCAFM-106	Project	Practical
BSCAFM-107	Practical	Practical

Semester 2

CODE	SUBJECT	PAPER Type
BSCAFM-201	Basic Digital Animation	Theory
BSCAFM-202	Basic 3D Animation	Theory
BSCAFM-203	Basic Of compositing	Theory
BSCAFM-204	Project	Practical
BSCAFM-205	Practical	Practical

Semester 3

CODE	SUBJECT	PAPER Type
BSCAFM-301	Language Of Camera & Cinematography	Theory
BSCAFM-302	Advanced Foundation Art	Theory
BSCAFM-303	Advanced Classical Animation	Theory
BSCAFM-304	Project	Practical
BSCAFM-305	Practical	Practical

Semester 4

CODE	SUBJECT	PAPER Type
BSCAFM-401	Advanced 3D Animation	Theory
BSCAFM-402	VFX Overview	Theory
BSCAFM-403	Sound(Audio Technology/Electronic Music)	Theory
BSCAFM-404	Project	Practical
BSCAFM-405	Practical	Practical

Semester 5

CODE	SUBJECT	PAPER Type
BSCAFM-501	Clay Animation	Theory
BSCAFM-502	Editing	Theory
BSCAFM-503	Post Production Of Film & Television	Theory
BSCAFM-504	Project	Practical
BSCAFM-505	Practical	Practical

Semester 6

CODE	SUBJECT	PAPER Type
BSCAFM-601	Pre Production Of Film	Practical
BSCAFM-602	Production Of Film	Practical
BSCAFM-603	Post Production Of Film	Practical

Overview of Animation

BSCAFM-101

Overview of World Cinema & Animation
History of animation and its implementation
Development of Animation through time- manual to digital
Different Medium for making animation
Pipeline for making an animation film

Books:

1. A Reader in Animation Studies by Jayne Pilling.
2. The Animation Book: A Complete Guide to Animated Filmmaking from Flip - books by Kit Laybourne.
3. Enchanted Drawings: The History of Animation- Charles Solomon
4. Animation Unlimited – Liz Faber & Helen Walters (Innovative short films since 1940)
5. Oxford History of World Cinema

Basic Foundation Art

BSCAFM-102

A. Basics of Visual elements and principles

- Lines, shapes, colour, value, texture, scale, and composition
- Equipment and materials
- Colour mixing Use of straight lines, shading and light
- Study of forms from Nature

B. Fundamentals of perspective

- Measurement and proportion
- Use of drawing in painting
- One point, two-point, three point perspective.
- Special vanishing points,
- Mixed perspective and ellipses.
- Creation of basic three-dimensional shapes using freehand techniques
- Drawing with mass, Proportions, structure,
- Construction of the human form,
- Measuring techniques
- Study of 3D form and its relationship to perspective

Books:

1. Perspective Drawing by Kenneth - W. Auvil
2. Perspective Drawing Handbook- Joseph D'Amelio
3. Pencil Drawing Techniques by David Lewis
4. A Text Book of Geometrical Drawing by William Minifie

5. The Everything Drawing Book: from Basic Shapes to People and Animals by Helen South
6. Force: Dynamic life drawing for Animators by Mike

Mechanics of Animation

BSCAFM-103

a) Basic principles of Animation

Understanding principles that translate sequential images into action in animation

- Squash and stretch
- Timing
- Staging
- Anticipation
- Slow In and Out or Eases
- Personality
- Follow through and overlapping action
- Straight Ahead Action and Pose-To-Pose Action
- Arcs
- Exaggeration
- Secondary Action
- Appeal

Books:

1. The Complete Animation Course: The Principles, Practice and Techniques of Successful Animation by Chris Patmore
2. The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators by Richard Williams
3. Timing for Animation by Harold Whitaker and John Halas

Basic Classical Animation

BSCAFM-104

- Overview of Classical Animation
- Cell Animation
- Drawing for classical Animation
- Introduction of 2D Animation
- The process of 2d Animation
- Basic Assignment of Animation
- Sound breakdown for 2D animation
- Animo

Books:

1. The illusion of life by Ollie Johnston & Frank Thomas
2. The Animator's Survival Kit by Richard Williams

Project

BSCAFM-106

- Make a project about the “Overview of World Cinema & Animation”
- What are the Different Medium for making animation
- Make a diagram of Pipeline for making an animation film
- Make a project about Basics of Visual elements and principles
- Project of perspective
- Make Practical project where all the animation principle present and define them.
- Make a project of classical animation pipeline with various diagrams.

Practical

BSCAFM-107

- Flip book creation
- Making paintings with deferent mediums
- Drawing perspective
- Gesture drawing
- Drawing posses and expression
- Basic Assignment of Animation
- Practical for understanding sound breakdown
- Practical of animo

Basic Digital 2D Animation

BSCAFM-201

- Overview of digital 2D Animation
- Basic of Photoshop
- Matte painting
- Character animation through flash
- Basic of toonboom studio

Books:

1. Flash Animation and Cartooning: A Creative Guide by Ibis Fernandez
2. How to Do Everything with Macromedia Flash MX 2004- by Bonnie Blake, Doug Sahlin
3. Exploring Flash MX 2004 by James L. Mohler
4. Developing Digital Short Films by Sherri Sheridan
5. Adobe CS Bible (Covering Photoshop, Illustrator, Indesign)
6. Creative Photoshop: Digital Illustration and Art Techniques, Covering by Derek Lea

Basic 3D Animation

BSCAFM-202

Basics of 3D

- 3D Production Pipeline
- Concepts and methods of 3D Modelling

Basic Modelling

- Introduction to Nurbs Curves
- Nurbs surface editing
- Polygon surface editing
- Modifying and deforming geometry

Basic of Character Modelling

- Basic Character design and 3D Modelling using Poly character modelling

Basic of Texture

- Creating Texture Maps
- BasicUv unwarp
- Bump mapping
- Procedural Texturing
- Background Texturing

Basic of Lighting

- Lighting Fundamentals
- Light types
- Attributes of Light
- Lighting objects & Shadows
- 3 Point Lighting
- Lighting a character
- Lighting a scene to matching the environment
- To enlarge the repertoire of tools to create animation

Rigging

- Normal controller based rigging
- TSM rigging
- Binding
- Set driven key and it's utilization on rigging
- Weight paint

Basic of Animation

- Key frame animation
- Blocking
- Breakdown
- Primary motion
- Secondary motion
- Graph editor
- Trax editor
- Dope sheet
- Blend shape
- Biped and quadruped movement
- Lip sync and expression

Basic of Dynamics

- Rigid body and soft body
- Field
- Fluid
- Particle
- Cloth
- Hair and fur
- Effects

Rendering

- Type of rendering
- Render passes
- GI and FG
- AO

Books:

1. Character Animation in 3D by Steve Roberts
2. Exploring 3D Animation with Maya by Patricia Beckmann-wells

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3. 3D Graphics & Animation: by Mark Giambruno
4. The Art of 3D by Isaac Victor Kerlow
5. Digital Character Animation by George Maestri
6. Animating Facial Features and Expressions by Bill Fleming, Darris Dobbs
7. Principles of Three-Dimensional by Michael O'Rourke
8. 3-D Human Modeling and Animation by Peter Ratner, Pe Ratner
9. Understanding 3D Animation Using Maya by John Edgar Park
10. Mastering 3D Animation by Peter Ratner
11. The art of 3D Computer animation and effects by Issac Victor
12. Principles of 3D computer animation by Micheal O'Rourke
13. Mastering 3D animation by Peter Ratner
14. 3D modelling and animation, synthesis and analysis technique for the human body by Nikos Sarins and Micheal G Strintzis

Basic of Compositing

BSCAFM-203

- Interface of the compositing software
 - 2D & 3D Interactivity
 - Applying operators
 - Creating Matte for Masking
 - Paint & Edit
 - Adding Text
 - Masking and shooting footage
 - Keying
-
- Time remapping and time stretching
 - Tracking

Books:

1. Digital Compositing for Film and Video, Second Edition by Steve Wright
2. The Art and Science of Digital *Compositing* by Ron Brinkmann
3. Blue screen Compositing by Jackman, John

Project

BSCAFM-205

- How to make a restoration image in photoshop
- Make a project about the matte-painting
- Make a small flash project

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- Make a project about lip sync in toonboom studio
- Make a project about Studio structure and workflow of the studio
- Make a short 3d film project

Practical

BSCAFM-206

- Restoration image in photoshop
- Make at least 3 matte-painting
- Basic Assignment of Animation through Flash
- Practical of lip-sync in toonboom
- Various 3D Assignment
- Mock test for interview

Language of Cinema & Cinematography

BSCAFM-301

a) Concept of Language of Cinema

- Use of Space (Mise – en – scene, camera angle, focus, movements, lights, shots)
- Use of Time (montage, basics of editing)
- Formation of Narrative

b) Basics of Cinematography

- Use of Space (Mise – en – scene, camera angle, focus, movements, lights, shots)
- Use of Time (montage, basics of editing)
- Cinematography for TV, Features, documentary, advertising or music video
- Film Production: Shot, Sequence, Scene, Basic Composition
- Image size, Camera Movement
- Films available, various stocks, magazines, Lab Standard
- Lighting techniques, use of shadows, architectural lighting & set lighting Analog Vs Digital Image, Comparative analysis, compatibility
- Different camera types and lenses

- Shot tracking

- Aesthetics of composition, staging and rigging
- Lighting techniques
- Rigging and pre-lighting
- Direction
- Directing the camera
- Directing the actor
- Making of narrative and non-narrative documentary films
- Seven Essential Acting Concepts
- The Audience, Character and the Scene
- Speech

- Acting Analysis
- Animation acting principles

c) Machinima

- Live-action cinema techniques
- Creating films in real-time – Machinima

Books:

1. Film Language: A semiotics of Cinema by C. Metz
2. Signs and Meaning in Cinema by Peter Wollen
3. How to Read a Film by James Monaco
4. Film Theory & Criticism by Ed. Leo Braudy Cohenm
5. Film Art: An Introduction by D. Bordwell & K. Thompson

Advanced Foundation Art

BSCAFM-302

a) Anatomy of Drawing (Life Study)

- Relationship of bones and muscles to movement
- Study of the human anatomy
- Study of the skeleton
- Study of head/facial features, using quick sketches
- Study of the different muscle forms and their placements
- Study of the muscles of the human body
- Observing proportion, gestures, mass and volume and modeling of form
- Study of the head, hands and feet.

b) Study of human and animal form & movement through sequential drawing, gestures etc..

- Sketching and exploring character and animal poses
- Overview of basic animal (quadruped) anatomy in comparison to human
- Gesture drawing,
- Quick Action drawings
- Linear gesture drawing
- Human Expressions

Photography Basics

- Brief history of Photography
- Fundamentals of Photography
- Techniques of Photography- camera
- Digital Photography -- Camera, Deleting, Chips, depending upon ME (Mega Bytes),

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Pixel

- Handling a professional still camera
- Studio photography
- Photo manipulation with Photoshop

Books:

1. Drawing the human body: An anatomical Guide by Giovanni Civardi
2. The Figure by Walt Reed
3. Basic figure drawing techniques by Greg Albert
4. The Artist's Complete Guide to Figure Drawing by Anthony Ryder, Watson-Guption
5. Drawing: Figures in Action by Andrew Loomis, Walter Foster
6. Dynamic Figure Drawing by Burne Hogarth, Watson-Guption
7. Life Drawing in Charcoal by Douglas R. Graves, Dover
8. How to Draw the Human Figure: An Anatomical Approach by Louise Gordon
9. Dynamic Anatomy: Revised and Expanded Edition by Burne Hogarth, Watson-Guption
10. Atlas of Human Anatomy for the Artist by Stephen Rogers
11. Drawing Dynamic Hands by Burne Hogarth, Watson-Guption
12. Drawing the Human Head by Burne Hogarth, Watson-Guption
13. Heads, Features and Faces by George Bridgman
14. Art in Motion by Maureen Furniss
15. Horses and Other Animals in Motion by Eadward Muybridge
16. The 35mm Photographers Hand book by Julian Calder & John Garrett
17. Basic Photography by John Hedgeco
18. Digital Photography: Expert Techniques by Ken Milburn
19. The Photoshop CS Book for Digital Photographers by Scott Kelby

Advanced Classical Animation

BSCAFM-303

- Acting
- Rotoscopy
- Lip-sync and acting Assignment
- 2D FX Animation
- Advanced Assignment of Animation
- Different treatment of 2D animation
- Live-2d combination

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Books:

1. Art in Motion: Animation Aesthetics by Maureen Furniss
2. Animation: The Mechanics of Motion by Chris Webster
3. Cartooning animation 1 with Preston Blair by Preston Blair
4. The animators reference book by Les Pardew and Ross Wolfley
5. Producing Independent 2D Character Animation: Making and Selling a Short Film by Mark Simon, Linda Simensky

Project

BSCAFM-304

- Make a project based of deferent types of film languages
- Make a project about camera angle, cuts, close ups, continuity and composition
- Make a project about anatomy drawings
- Make a project of photography basics
- Make a project on live-2d combination

Practical

BSCAFM-305

- Practical for film languages
- Gesture drawings
- Life study
- Still life study
- Advanced Assignment of Animation
- 2D FX Animation
- Lip-sync and acting Assignment
- Acting
- Live-2d combination

Advanced 3D Animation & Gaming

BSCAFM-401

a) Conceptual knowledge of game creation

- Understand the history and evolution of game design and technology
- Honing creativity, design, computer and problem-solving skills in the area of game Design

b) Advanced Animation

- Character Animation - Walk cycle, Run cycle, Jumping
- Timing, movement, mood, camera and lighting.
- Animation using weights
- Character Rigging: Skeletons, Skinning and Constraints for controls

- Forward Kinematics and Inverse Kinematics
- Deformers
- Facial animation for lip synch
- Non-Linear Animation (Trax editor)
- Animation Layering
- Animation Planning
- Secondary Animation

c) Gaming Modeling and Animation

- High detail low poly modeling
- Poly count
- Z-brush / Maya Workflow
- Knowledge of Python
- Level of Detail

Books:

1. All about Techniques in Drawing for Animation Production by Sergi Camara
2. Character animation 2D skill for better 3D by Steve Roberts
3. Character Animation in 3D: Use Traditional Drawing Techniques to Produce by Steve Roberts
4. Character animation in 3D by Steve Roberts
5. Character animation 2D skills for better 3D by Steve Roberts
6. MoCap for Artists: Workflow and Techniques for Motion Capture by Midori Kitagawa, Brian Windsor
7. The Complete Animation Course by Chris Patmore

VFX Overview

BSCAFM-402

a) Evolution of Cinematic Visual Effects

- Dawn of Special Effects
- Film and Manipulated Reality
- Animation from Paint brush to Pixel
- Principals of VFX
- VFX & CG Today

b) Introduction of visual effects

- Description of 2d and 3d VFX
- Composite of VFX
- Some of VFX software
- Apple Shake
- Combustion
- After effects
- Practical project of VFX

c) Special effects role in visual language

- An awareness of and an ability to create convincing atmosphere
- Creating animated environments and atmosphere like flames, smoke, water, rain, snow etc. to offset principal animation
- Creating special effects such as explosions, speed lines etc.

Books:

1. Visual Effects in A Digital World: A Comprehensive Glossary of Over 7000 by Karen E. Goulekas
2. Visual Effects Cinematography by Zoran Perisic
3. Filming the Fantastic: A Guide to Visual Effects Cinematography by Mark Sawicki
4. Visual Effects for Film and Television by Mitch Mitchell, A. J. Mitchell
5. Creative Photoshop: Digital Illustration and Art Techniques, Covering by Derek Lea
6. Adobe Photoshop for VFX Artists by Lopsie Schwartz
7. The Cinema Effect by Sean Cubitt
8. Visual Effects Cinematography by Zoran Perisic
9. History of Cinematic effects - The Emergence of Cinematic

Sound (Audio Technology/Electronic Music) BSCAFM-403

a) Sound dynamics

- Role of sound effects
- Sound Edit & Clarity
- Sound Edit & Creative Sound
- Ideas & Sound
- Editing Audio
- Audio Sync
- Microphone techniques and boom operations
- Sound as a key component of animation

b) Sound Designing

- Role of sound effects
- Designing sound track, music, dialogue, voice-over, lip synch and FX
- Track mixing & recording to digital pic
- track laying music and film mixing
- Post processing sound
- Understanding the dynamics of camera moves and magnifications
- Experimenting with camera techniques and working directly under camera
- Using registration fields, table moves and peg movements

Books:

1. Practical art of motion picture sound by David Lewis Yewdall
2. Audio Postproduction for Digital Video by Jay Rose

Project

BSCAFM-404

- Make a project on game design
- Make a project on 3d advanced Acting animation
- Make project on low poly modeling and texturing
- Make a project about visual effects
- Make a project about sound designing

Practical

BSCAFM-405

- Make a concept of game
- Make preproduction of game design
- Make the low poly model of BG, props and character
- Make the texture
- Advanced assignments for 3D
- Assignments for Sound editing

Clay animation overview

BSCAFM-501

- Basic of clay
- Creating clay sets
- Creating the character
- Buildup a small story
- Lip sync for clay
- Capturing clay animation
- Clay animation project

Books:

1. How to Make Clay Characters by Maureen Carlson
2. Stop Motion: Craft Skills for Model Animation, S... by SusannahShaw

3. Making Clay Animation, by N. Smith & M. Kolk

Editing

BSCAFM-502

a) Principles of Editing

- Role of sound effects
- Pace, sound, genre, action
- Picture Edit & Continuity
- Picture Edit & Pace
- Matching action, cutting on movement
- Editing Genre – Action, Dialogue, Comedy, Documentary

b) Non-linear editing & digital technology

- Interface of a Non Linear editing tool
- Importing assembling and previewing footage
- Basic Editing (Fade-in, Fade-out, Cut to Cut)
- Adding Transitions

- Advance Editing (2 Point, 3 Point Editing)
- Titling
- Combining images (e.g. layers, juxtaposition and montage, compositing)
- Effects (e.g. keying, mattes, filmstrips and rotoscoping)

Books:

1. The Eye is Quicker: Film Editing by Richard Pepperman
2. Technique of Film Editing, Second Edition (Paperback)-Karl Reisz (Author), GAVIN MILLAR (Author)
3. On film editing: an introduction to the art of film construction By Edward Dmytryk
4. Nonlinear Editing: Storytelling, Aesthetics, & Craft (Paperback) ~ Bryce Button (Author)

Post production of Film & Television

BSCAFM-503

- Process and logistics of maintaining production parameters
- Art direction, production styles and formats
- Budgeting, financing and insuring

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- Publicity, promos and rating
- TV technology, transmission and operations
- Video and Audio compression, formats and codec
- Digitizing video, Compatibility of video formats with different computing platforms
- Standard editorial procedures including logging, syncing and storage of materials
- Grading process and the role of the colourist
- Creative theories (production and reception, individuals and audiences)

Books:

1. Guide to Postproduction for TV and Film: Managing the Process by Barbara Clark, Susan Spohr
2. Editing & Post-Production: screencraft by Declan McGrath
3. Film Tehnology in Post Production by Dominic Case
4. High Definition Postproduction. Editing and Delivering HD Video Editing by Steven E. Browne

Project

BSCAFM-504

- A small clay short animation Film project
- Make a project about Editing
- Make a project on pipeline of post production

Practical

BSCAFM-505

- Basic assignments for clay animation
- How to play with clay
- Making model in clay

- Making the set for clay animation
- Making the light arrangement for clay animation
- Practical assignment for editing
- Practical of various software what we use for post production

Pre Production of Film

BSCAFM-601

- Idea
- Concept
- Visualization
- Script
- Making visual representation of script /story board creation
- Understanding film language on the time of creating storyboard
- Layouts
- Preparation for set design (for Clay animation)
- Treatment of film

- Character design
- Making animations

Production of Film

BSCAFM-602

Though the medium is elective the pipeline of production also deferent for deferent medium.

- For 2d classical –making key frame, extreme , breakdown , clean ups, in between and final line animation etc
- For 2d flash- almost same as 2d classical
- For 3d- modeling (character, BG and props), texturing, lighting, rigging, animation, dynamics (if needed) and rendering/render passes.
- For Clay – modeling characters and props, creating Set, shoot by stop motion pro software etc.
- For experimental- depends
- For others- depends

Post Production of Film

BSCAFM-603

Final part of making a film is post production part. For this section we need

- Sound editing and sound synchronization
- Compositing
- Editing
- Transferring