

Masters in Design

Animation

COURSES OF STUDY

IDC, IIT Bombay

M.Des in Animation

The Animation program in IDC will strive to create people with expertise who will eventually emerge as leaders to influence the future of Animation. IDC expects the students to assume direct responsibility for nearly all aspects of the film making process. The students will have access to cutting edge IT capabilities and the proximity to other engineering disciplines which would facilitate cross disciplinary and collaborative projects, also new areas for animation applications can be explored and experimented with. The proposed course content includes all areas of study essential to nurture a well rounded approach to learning and understanding in the field of animation.

Animation Course Content - Semester 1

Course Number	Course Name	L	T	ST	Credits
VC 601	Visual Language – Syntactics	0	0	4	6.0
AN 601	Animation Principles and History	1.5	0	2	6.0
AN 603	Animation Process and Visual Form	0	0	4	6.0
VC 609	Art, Design and Society I	2	0	0	4.0
ID 643	Design Issues	2	0	0	4.0
	Elective I				6.0
	Elective II				6.0
	Total Credits for Semester I				38.0

Animation Elective Courses - Semester 1

Course Number	Course Name	L	T	ST	Credits
VC 603	Image Making and Representation I	0	0	4	6.0
VC 605	Photo Communication	0	0	4	6.0
ID 627	Elements of Design	0	0	4	6.0
ID 629	Media Investigation and Communication Methods	0	0	4	6.0
ID 645	Exposure to Design	0	0	4	6.0
ID 667	Design Workshop I	0	0	4	6.0
AN 609	Life Drawing	0	0	4	6.0

AN 601

Animation Principles And History

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Principles

- Understanding principles that translate sequential images into action to make animation believable
- Understanding properties of matter
- Making use of the wave principle, delayed secondary action, slow and fast action impact, speed, weight, tendency of weight to move in a certain way, recoil effects, squash and stretch related to weight, overlapping action, follow through
- Animating force acting on objects, object weight, construction, flexibility, object behaviour when force acts on them
- Principles of Timing
- Gaining an insight into the invisible concept of time in nature
- Understanding the basic unit of time in animation
- Emphasizing the difference between caricature, drama, humour
- Timing governing acting and movement
- The use of anticipation, action, reaction
- Methods of doping, writing exposure sheets, bar sheets
- Planning accents, beats, scene timing, spacing of drawings, holds, easing in and out
- Animating to music
- Principles of Movement
- Understanding the meaning of movement and movement in nature and what movement expresses
- Awareness of how mood and feeling can be conveyed through movement and animate and inanimate object behaviour
- Examining the laws of motion in the context of animation; cause and effect, thrown objects, rotating, force, oscillating movement, friction, resistance
- Studying the tendency of weight to move in a particular manner
- Simplification and exaggeration of movement

Animation History

- To gain an understanding of the evolution of animation
- Delving into animation history- both of India and the world.
- Precursors to animation: Cave paintings, animation toys
- Animation before Disney
- Studio animation
- Feature animation
- Experimental animation
- Personal films and expression
- Adult animation
- Animation Today

References for principles and theory

- Harold Whitaker and John Halas, Timing for Animation, Focal Press, Oxford, 2002
- Preston Blair, Cartoon Animation, Walter Foster Publishing Inc., CA, 1995
- Edited by Peter Hames, Dark Alchemy, The Films of Jan Svankmajer, Greenwood Press, 1995
- John Culhane, Disney's Aladdin – The Making of an Animated Film Hyperion, NY, 1992

References for History

- Dave Smith, The Official Encyclopedia – Disney A to Z Hyperion, NY, 1998
- Vol : 18, Special Issue of Art History, March 1985
- Leonard Maltin, Of Mice and Magic – A History of American Animated Cartoons Plume, Penguin Books. USA, 1990
- Bob Thompson, Disney's Art of Animation – From Mickey Mouse to Hercules Hyperion, NY, 1997
- Donald Craften, Before Mickey – The Animated Film [1898 – 1928], The University of Chicago Press, 1993
- Peter Hames (edited by), Dark Alchemy, The Films of Jan Svankmajer, Greenwood Press, 1995
- John Culhane, Disney's Aladdin – The Making

- of an Animated Film Hyperion, NY, 1992
- Alan Cholodenko (edited by), The Illusion of Life- Essays on Animation Power Publication in association with Australian Film Commission, SYD, 1991
- Eric Smoodin (edited by), Routledge, Disney Discourse – Producing the Magic Kingdom, London, 1994
- Jay Leyda (edited by), Eisenstein on Disney, Seagull Books, Calcutta, 1986
- Ernest Pintoff, Animation 101 Michael Wiese Productions, CA, 1999

AN 603

Animation Process And Visual Form

0 0 4 6

Animation Processes

- Covers the entire process from script to screen in process for an animation film (short or feature)
- Overview of the Process
- Preproduction, Production, Post Production
- A comparison between live action film making & animation The primary difference being that an animation film tends to be pegged down pretty accurately by the end of the preproduction process itself whereas for a live action film it is close to completion only at the end of editing which is a post production process.

Preproduction

- Story to Script
- Whether adapted or original, taking the story from a verbal or spatial medium like a book or graphic novel to a form suitable for making a film. What makes a good story?
- Plot & Character: Action Plots & Mind Plots. Analysis of different types of plots
- Archetypes v/s Stereotypes - understanding of archetypes and a brief introduction to the mono myth (hero's journey).
- Why Animation? (instead of live action)
- Animation as a story telling (narrative) medium

- Animation as an artistic medium
- Visual Concepts, Character Exploration & Storyboards
- Animatics
- Character Design & Model Sheets, Layouts & Scene Planning

Production

- Animation
- Acting - Animation is not about moving images but moving people
- Traditional 2D anim
- a. Linetests - Keyframes & Timing (breakdowns & inbetweens) also brief introduction to thumbnailing (for quick exploration of alternative methods of animating a scene)
- Study comparisons between different rhythms of animation
- Executing straight ahead and inbetweened planned animation, limited animation full animation
- Drawing key frames, breakdowns, inbetweens, animation cycles
- Cleanups

Post Production

- Voice, Music & Effects
- Understanding the dynamics of sound design and use of sound as a key component of animation
- Designing a sound track for animation including music, dialogue, voice overs, lip synch and FX
- Recording and mixing multiple tracks
- Post processing sound
- Compositing & Editing
- Work in Progress. Development of a film from Animatic to Edit with different scenes at different stages.
- Coming together of the various elements of the scene.
- Final Mixing of Sound & Final Edit
- 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
- Screening & Feedback
- Pitching a Project, Financing, Production & Distribution

Visual Form

- Exploring the look and feel for animation through concept art
- Planning character design, layout design, illustration style, composition, staging, backgrounds
- A study of indigenous design and painting, both contemporary and traditional to understand and analyze a variety of styles and visual language

References for processes

- Shamus Culhane, Animation from script to screen, St.Martin's Griffin Press, NY, 1990
- Richard William, The Animators Survival Kit, Faber and Faber, New York, London, 2002
- Kit Laybourne, The Animation Book, Crown Trade Paperbacks, NY, 1998
- Tony White, The Animator's Workbook- Step by Step Technique of Drawn Animation, Watson-Guptill Publications, 1988
- Mascelli Joseph V, The Five C's of Cinematography: Motion Pictures Filming Techniques, Silman-James Press, 1998
- Daniel Arijon, Film Technique, Silman-James Press, 1991
- David Sonnensch, Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema, Michael Wiese Productions, 2001
- David Lewis Yewdall, Practical Art of Motion Picture Sound, Second Edition, Focal Press, 2003
- Tomlinson Holman, Sound for Film and Television, Second Edition, Focal Press, 2001

References for Visual Form

- Mark Cotta Vaz, The Art of Finding Nemo, Cronicle Books, 2003
- Gary Russell, The Art of The Fellowship of the Rings, Houghton Mifflin, 2002
- Gary Russell, The Art of The Two Towers (The Lord of the Rings), Houghton Mifflin, 2003
- Gary Russell, The Art of The Return of the King (The Lord of the Rings), Houghton Mifflin, 2004
- Will Eisner, Graphic Storytelling, Poorhouse Press, 1996
- Will Eisner, Comics and Sequential Art, Poorhouse Press, 1985
- Scott McCloud, Understanding Comics, Perennial Currents, 1994
- Bradford W. Wright, Comic Book Nation, Johns Hopkins University Press, 2003
- Stephen Missal, Exploring Drawing for Animation (Design Exploration Series), Thomson Delmar Learning, 2003

AN 609

Life Drawing

0046

- To become fluent with capturing the human and animal form
- Proportions, structure, volume and shading techniques

References

- John.V.Vanderpoel, The Human Figure, Dover Publication Inc., NY, 1958
- George.B.Bridgman, Bridgman's Life, Drawing Dover Publication Inc., NY, 197
- Betty Edwards, The New, Drawing on the Right Side of the Brain, Harper Collins Publishers, 2001
- Betty Edwards, The New, Drawing on the Right Side of the Brain, Workbook Souvenir Press Ltd., London, 2002
- Stephen Missal, Exploring Drawing for Animation (Design Exploration Series), (Paperback) Thomson Delmar Learning, 2003

Animation Course Content - Semester 2

Course Number	Course Name	L	T	ST	Credits
AN 602	Animation Design and Theory	1.5	0	2	6.0
AN 604	Animation Scripting and Methods	0	0	4	6.0
VC 654	Semantics and Communications Theory	1.5	0	2	6.0
VC 614	Art, Design and Society II	2	0	0	4.0
AN 605	Computers for Animation				Audit
	Elective III				6.0
	Elective IV				6.0
	Total Credits for Semester I				34.0

Animation Elective Courses - Semester 2

Course Number	Course Name	L	T	ST	Credits
VC 602	Image Making and Representation II	0	0	4	6.0
VC 604	Digital Video Communication	0	0	4	6.0
VC 618	Information Graphics	0	0	4	6.0
VC 620	Advanced Typography	0	0	4	6.0
VC 624	Designing Interactive Experiences	0	0	4	6.0
VC 626	Story and Narrative	1.5	0	2	6.0
ID 634	Sketching for Designers	0	0	4	6.0
ID 638	Product Interface Design	0	0	4	6.0
IN 604	Usability Evaluation	1.5	0	2	6.0
IN 612	Interactive Media	0	0	4	6.0
IN 614	Soft Prototyping Techniques	0	0	4	6.0
AN 608	Anatomy and Drawing	0	0	4	6.0
ID 668	Design Workshop II	0	0	4	6.0
	Institute Elective				6.0
	Institute Elective				6.0

AN 602

Animation Design and Theory

0 0 4 6

- Study of Animation Techniques & styles developed and used over the years in animation.
- Appreciating the difference between the processes of the basic 3 methods of animation, namely
- frame by frame creation of animation (like traditional 2D)
- modification of object or image to produce animation. (like paint on glass, sand on glass, simple claymation without armatures etc)
- manipulation of objects to produce animation. (like 2D cutout animation, 3D claymation with armatures, simple object animation, Puppets, etc)
- Exploring & developing the animation world based on the technique you might choose for animation.
- The Digital World and the avenues opened by it in terms of animation design.

Animation articulation and performance

- Understanding the role of drama and acting in creating convincing characterization and emotion
- Creating believability by taking off on the natural, making objects behave in character
- Expressing attitude, gesture, body language
- Role playing through actual and mental miming
- Character acting, reacting, take
- Expressing exaggeration through caricatured matter acted upon by caricatured forces

Character Animation

- Reflecting on human movement
- Gaining an insight into creating believable action
- Practicing the mechanics of biped walks, runs, head turns, gestures
- Methods of lip-syncing to sound breakdowns
- Posing characters in scenes

Animal movement

- Reflecting on animal movement
- Gaining an insight into creating believable action
- Practicing the mechanics of quadruped- walks, runs, gallops; bird movement and flight

Sfx

- 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.

Theory

- Understanding contemporary trends in animation making in terms of content, styling, techniques and applications
- Studying animation films through film viewing, appreciation, criticism, theoretical writings, essays, research studies
- Aesthetics: Introduction to Aesthetics (Indian and Western)
- Introduction to major art movements
- Narrative: Introduction to narrative structures (Indian and Western)
- Modes of Narrative
- Narrative Discourse
- Film Theory: Perception
- Representation
- Signification
- Genres
- Identification and Psychoanalysis
- Interpretation

References:

- Ed Hooks, Acting for Animators Heinemann, Reed Elsevier, 2000

- Eadweard Muybridg, *The Human Figure in Motion*, Dover Publication Inc., NY, 1995
- Richard William, *The Animators Survival Kit*, Faber and Faber, New York, London, 2002
- David Choquet, *1000 Game Heroes*, Taschen. 2002
- Eadweard Muybridg, *Animals in Motion*, Dover Publication Inc., NY, 1957
- Alan Cholodenko (edited by), *The Illusion of Life- Essays on Animation Power*, Publication in association with Australian Film Commission, SYD, 1991
- Eric Smoodin (edited by), *Disney Discourse – Producing the Magic Kingdom* Routledge, London, 1994
- Jay Leyda (edited by), *Eisnstein on Disney* Seagull Books, Calcutta, 1986
- Ernest Pintoff, *Animation 101*, Michael Wiese Productions, CA, 1999

AN 604

Animation Scripting and Methods

0 0 4 6

- Experimenting with techniques for visual storytelling, structure, story building, writing for animation
- Examining indigenous narratives, both contemporary and traditional to gain an understanding of storytelling methods pertinent to our culture
- Creating dramatic flow, planning, pacing, sequencing, organizing visual flow and continuity in storyboards
- Co-ordinating character, scene length, pace of action
- Choreographing scene change and camera movement
- Planning, examining, analyzing and pacing character behaviour
- An exposure to various animation techniques
- Workshops using both 2D and 3D techniques on Computer, Film, Video etc.
- Production of professional stop-motion animation puppet and usable set props.
- Understanding how a stop-motion animation production works

- Sculpting, mould making, armature construction and casting techniques.
- Methods to fabricate a stop-motion animation puppet
- Techniques for set construction.
- Doping, animating, lighting and shooting
- Post production techniques

References for Methods

- Robert Russett and Cecile Starr, *Experimental Animation, Origins of a New Art A Da Capo Paperback*, NY, 1998
- Peter Lord and Brian Sibley, *Cracking Animation –The Aardman book of 3D Animation*, Thames & Hudson, 2000
- Richard Taylor, *Encyclopedia of Animation Techniques*, Book Sales, 2004
- Michael Frierson, *Clay Animation: American Highlights 1908 to Present*, Twayne Publishers, 1994
- Chris Patmore; *The Complete Animation Course: The Principles, Practice, and Techniques of Successful Animation*, Barron’s Educational Series, 2003
- Frank Thompson, *The Making of The Nightmare Before Christmas*, Disney Editions, 2002
- Peter Lord and Brian Sibley, *Cracking Animation –The Aardman book of 3D Animation*, Thames & Hudson, 2000

References for scripting

- Marilyn Webber, *Gardner’s Guide to Feature Animation Writing: The Writer’s Road Map* Garth Gardner Company, 2002
- Jeffrey Scott, *How to Write for Animation*, Overlook Press, 2002
- Marilyn Webber, *Gardner’s Guide to Animation Scriptwriting: The Writer’s Road Map*, Garth Gardner Company, 2002
- Jean Ann Wright, *Animation Writing and Development: From Script Development to Pitch* (Focal Press Visual Effects and Animation), Focal Press, 2005

AN 605

Computers for Animation

Audit

- To enlarge the repertoire of tools to create animation
- An experience of working across varied Animation Software like Maya, Animo, 3D Studio Max, Flash etc.

References

- Dan Ablan, Digital Cinematography & Directing, New Riders Press, 2002
- Jeremy Birn, Digital Lighting & Rendering, New Riders Press, 2000
- Owen Demers, Digital Texturing & Painting, New Riders Press, 2001
- Glenn Kirkpatrick, Flash Cartoon Animation: Learn from the Pros, A-Press, 2003

AN 606

Animation Theory

0 0 4 6

- Understanding contemporary trends in animation making in terms of content, styling, techniques and applications
- Studying animation films through film viewing, appreciation, criticism, theoretical writings, essays, research studies
- Aesthetics: Introduction to Aesthetics (Indian and Western)
- Introduction to major art movements
- Narrative: Introduction to narrative structures (Indian and Western)
- Modes of Narrative
- Narrative Discourse
- Film Theory: Perception
- Representation
- Signification
- Genres
- Identification and Psychoanalysis
- Interpretation

References:

- Dark Alchemy, The Films of Jan Svankmajer
- Edited by Peter Hames, Greenwood Press 1995
- Disney's Aladdin – The Making of an Animated Film
- John Culhane, Hyperion, NY, 1992
- The Illusion of Life- Essays on Animation
- Edited by Alan Cholodenko, Power Publication in association with Australian Film Commission, SYD, 1991
- Disney Discourse – Producing the Magic Kingdom
- Edited by Eric Smoodin, Routledge, London, 1994
- Eisenstein on Disney
- Edited by Jay Leyda, Seagull Books, Calcutta
- Animation 101
- Ernest Pintoff, Michael Wiese Productions, CA, 1999

AN 608

Anatomy and Drawing

0 0 4 6

- Understanding of the relationship of bones and muscles at rest and in movement to be able to translate this to creating and maintaining correct volumes
- Studying human and animal movement through sequential drawings, gesture drawing

References

- Victor Perard, Anatomy and Drawing, Dover Publications Inc., NY, 2004
- Steve Roberts, Character Animation in 3D: Use traditional drawing techniques to produce stunning CGI animation, Focal Press, 2004
- Christopher Hart, Drawing Cutting Edge Anatomy: The Ultimate Reference for Comic, Watson-Guption Book Artists Publications, 2004
- Eadweard Muybridge, Animals in Motion, Dover Publication Inc., NY, 1957
- Eadweard Muybridge, The Human Figure in Motion, Dover Publication Inc., NY, 1995

Animation Course Content - Semester 3

Course Number	Course Name	L	T	ST	Credits
AN 610	Sound and Camera	0	0	4	6.0
VC 615	Indian Thoughts and Traditions	2	0	0	4.0
	Elective V				6.0
	Elective VI				6.0
ANP 601	Summer Project 1 (Mid May - Mid June)				6.0
ANP 602	Design Project 2 (Mid June - End November)				18.0
	Total Credits for Semester III				46.0

Animation Elective Course Content - Semester 3

Course Number	Course Name	L	T	ST	Credits
VC 627	Advanced Digital Video Communications	0	0	4	6.0
VC 619	Advanced Photography	0	0	4	6.0
VC 635	Studies in Human Computer Interaction	0	0	4	6.0
VC 637	Experimental Animation	0	0	4	6.0
VC 667	Visual Culture	1.5	0	2	6.0
ID 639	Design Management and Professional Practice	1.5	0	2	6.0
ID 653	Product Detailing	0	0	4	6.0
ID 657	Advanced Ergonomics	0	0	4	6.0
ID 659	Product Semantics	0	0	4	6.0
ID 665	Craft, Creativity and Post-Modernism	0	0	4	6.0
ID 669	Design Workshop III	0	0	4	6.0
ID 675	Designing Game for Children	0	0	4	6.0
IN 653	Instructional Design	1.5	0	2	6.0
AN 611	Representation Methods for Animation	0	0	4	6.0
	Institute Elective				6.0

AN 610

Sound and Camera

0 0 4 6

- Understanding the dynamics of sound design and use of sound as a key component of animation
- Designing a sound track for animation including music, dialogue, voice overs, lip synch and FX
- Recording and mixing multiple tracks
- 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

References

- Mascelli Joseph V, The Five C's of Cinematography: Motion Pictures Filming Techniques, Silman-James Press, 1998
- Daniel Arijon, Film Technique, Silman-James Press, 1991
- David Sonnensch, Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema, Michael Wiese Productions, 2001
- David Lewis Yewdall, Practical Art of Motion Picture Sound, Second Edition Focal Press, 2003
- Tomlinson Holman, Sound for Film and Television, Second Edition Focal Press, 2001

AN 611

Representation Techniques For Animation

0 0 4 6

- Different techniques of representations for animation.
- Experiment with different methods of representation
- Exploring different skills, tools and medias to represent for animation.

References

- George.B.Bridgman, The Book of a Hundred Hands, Dover Publication Inc., NY, 1972
- Richard Taylor , Encyclopedia of Animation Techniques, Book Sales, 2004
- Robert Russett, Experimental Animation: Origins of a New Art Cecile Starr (Editor), Capo, 1988
- Alan Watt, M. Advanced Animation and Rendering Techniques Watt, Addison-Wesley Professional, 1992

AN 613

Animation Technology

0 0 4 6

- An exposure to the latest that technology has to offer when it comes to applications in the filed of animation.
- Student will be kept abreast with innovative and ground breaking techniques adapted/invented which have pioneered the process of animation.
- Simulation (Environments etc.)
- Crowd Control
- MOCAP (Motion Capture)
- VR (Virtual-reality)
- Rendering Technologies
- Digital Lighting
- Compositing Techniques
- Effects - reflections, refractions, global illumination and caustics.
- Motion Building
- Alternative Modelling Methods – eg.: Luxology Modo,
- CLOTHFX
- Studio visits

ANP 601

Summer Project I

6 Credits

(Mid June to mid July)

This is a summer project that can be done with an industry, professional design firm, an institution or an organisation like an NGO. The objective of this project is to be part of the process where design is being implemented, contribute towards the process and learn from the situation. The project is meant to expose the student to design practices in his chosen area of interest. This project is expected to influence the degree project in many cases.

ANP 602

Design Project II

18 Credits

(Mid July to November end)

- An independent project with one of the following focus:
- Design project of student interest and / or faculty interest and / or industry project
- Re-design project that relooks at an existing problem or situation
- Research project, delving into methodological or pedagogic issues
- Exploration project, exploring application possibilities in a new technology or medium or variations

Animation Course Content - Semester 4

Course Number	Course Name	L	T	ST	Credits
AN 614	Design Research-Seminar	0	0	4	6.0
ANP 603	Design Project III – Stage 1 (from December 1st – end February)				12.0
ANP 604	Design Project III – Stage 2 (from March – April /June)				24.0
	Total Credits for Semester IV				42.0
	Total Credits for M Des. programme in Animation				160.0

AN 614**Design Research-Seminar****0 0 4 6**

- The course involves student researching in an area related to design and is expected to produce an insightful report or a paper on the topic. Students need to choose a topic suggested by a faculty member and work under faculty guidance. The work may involve primary and secondary research, creative exploration out alternatives, experimental set-ups and methodical documentation. Students are encouraged to explore new fields, materials and media, with a focus on analysis. The student is required to present a seminar on the topic at the end of the semester.

ANP 603**Design Project III Stage1****12 Credits**

- Duration: 3 months from December – end of February.
- This project could be an extension of the previous project (if the scope of the project justifies the extension) or it could be an independent project with one of the following focus:
- Design project of student interest and / or faculty interest and / or industry project
- Re-design project that relooks at an existing problem or situation
- Research project, delving into methodological or pedagogic issues
- Exploration project, exploring application possibilities in a new technology or medium or variations.
- The evaluation of the Stage 1 of Project II is done internally with a panel appointed by the DPGC in consultation with the guide. The panel will consist of the guide and two other faculty members.

ANP 604**Design Project III Stage 2****24 Credits**

- Duration: 2-4 months from March – end June.
- This project will be an extension of the project II and should include development of the final design concept. The defence presentations will be held during the month of April and time given till the end of June to complete the jury feedback, final drawings and finer detailing of the project
- The evaluation of the Stage 2 of Project II is done by a panel of examiners appointed by DPGC. The panel will consist of external jury member along with an internal examiner, the guide and the chairman (A Professor or an Associate Professor from another Department of IIT Bombay)