Rayat Shikshan Sanstha's

YASHAVANTRAO CHAVAN INSTITUTE OF SCIENCE, SATARA

(AN AUTONOMOUS COLLEGE)

Reaccredited by NAAC with 'A+' Grade

Bachelor of Science

Part - III

ANIMATION SCIENCE

Syllabus

to be implemented w. e. f. June, 2023

Structure of the course:

Semester V

Sr. No.	Subject Title	Theory					Practical	
		Course No. and Course code	Title of Course	No. of lectures per week	Credits	Practical	No. of lectures per week	Credits
1.	Animation Science	BAST-501	**3D Maya Rigging & Animation**	3	2	BASP-508	8	4
2.		BAST-502	**Rotoscoping**	3	2			
3.		BAST-503	**Computer Based 2D Animation**	3	2	BASP-509	8	4
4.		BAST-504	**A-Market Research B- E-commerce C- UID**	3	2			
5.		SECCAST 507	**Artificial Intelligence**	2	1	BASP-510 Numerical Skill	3	1
6.						BASP-511-Project	5	2
7.		AECC-5	**English for communication I**	3	2			
Total				17	11		24	11

Semester VI

Sr. No.	Subject Title	Theory					Practical	
		Course No. and Course code	Title of Course	No. of lectures per week	Credits	Practical	No. of lectures per week	Credits
1	Animation Science	BAST-601	**2D Game Development**	3	2	BASP-608	8	4
2		BAST-602	**Marketing Management**	3	2			
3		BAST-603	**Dynamics & Rendering**	3	2	BASP-609	8	4
4		BAST-604	**A-3D Printing in Animation** **B- AR for Animation** **C - VR for Animation**	3	2			
5		SECCAST 607	**Entrepreneurship Development**	2	1	BASP-610 Numerical Skill	3	1
6						BASP-611-Project	5	2
7		AECC-6	**English for communication II**	3	2			
Total				17	11		24	11

B.Sc. III: Evaluation structure

Semester V

Theory Course	ESE	Internal Evaluation			Total	Practical Course	Practical Exam	Submission		Total
		ISE-I	Mid Sem	ISE-II				Case study/ Educational Tour/Seminar	Student Performance	
BAST-501	30	5	10	5	50	BASP-508	40	5	5	**50**
BAST-502	30	5	10	5	50					
BAST-503	30	5	10	5	50	BASP-509	40	5	5	**50**
BAST-504	30	5	10	5	50					
SECCAST - 507	20	-	-	-	20	BASP-510	30	-		**30**
						BASP-511	50	-		**50**
AECC-5	30	5	10	5	50	-				
Total					**270**					**180**
Grand Total		**450**								

B.Sc. III: Evaluation structure

Semester VI

Theory Course	ESE	Internal Evaluation			Total	Practical Course	Practical Exam	Submission		Total
		ISE-I	Mid Sem	ISE-II				Case study/ Educational Tour/Seminar	Student Performance	
BAST-601	30	5	10	5	**50**	BASP-608	40	5	5	**50**
BAST-602	30	5	10	5	**50**					
BAST-603	30	5	10	5	**50**	BASP-609	40	5	5	**50**
BAST-604	30	5	10	5	**50**					
SECCAST - 607	20	-	-	-	**20**	BASP-610	30	-		**30**
						BASP-611	50	-		**50**
AECC-6	30	5	10	5	**50**	-				
Total					**270**					**180**
Grand Total		**450**								

Distribution of project lab marks

Sem V (50 Marks) + Sem VI (50Marks) =100 Marks

Sem V (50 Marks)

Pre-production and Industrial Training (Total 50 Marks)

15 – Pre production work

10- Production Project Report

05- Marks for industrial visit / Excursion (Educational Tour)/Seminar in Semester V

10- Case Study/Educational Tour/Seminar/Training/ Scientific Writing

10- Day to day Performance

Sem VI (50Marks)

Project Marks Distribution (Total 50 Marks)

05 - Project Viva

05 - Project Design

10 - for industrial training in vacation, 10 days after completion of Semester V **(Registered organization industrial training certificate required)**

10 - Project Report

10- Case Study/Educational Tour/Seminar/Training/ Scientific Writing

10- Day to day Performance

Note: - Project should be based on Classical Animation, 2D Animation / 3D Animation/ game development / AR App development (Unity)

Semester V

Structure and titles of the course of B.Sc. III course

Code	Name of Course	Units
BAST - 501	**3D MAYA RIGGING & ANIMATION** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** 3D Rigging **Unit II:** 3D Animation **Unit III:** 3D Lighting **Unit IV:** 3D Rendering
BAST - 502	**ROTOSCOPING** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Introduction to Roto **Unit II:** Working with various Nodes **Unit III:** Rotoscoping with Mocha Pro **Unit IV:** Rendering and Final Output
BAST - 503	**COMPUTER BASED 2D ANIMATION** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Production Workflow & Interface **Unit II:** Drawing Tools & Applying Effects **Unit III:** Palettes and Styles **Unit IV:** Working with Rendering
BAST - 504	**A-MARKET RESEARCH** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Marketing Research-Basic understanding **Unit II:** Branches of Marketing Research **Unit III:** Marketing Research Proposal & Design & Scales of Measurement **Unit IV:** Sampling in Marketing Research & Marketing Research Report
BAST - 504	**B- E-COMMERCE** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Over view of E-Commerce **Unit II:** Trends & Issues of E-commerce **Unit III:** Web Services & Technology **Unit IV:** Modes, Matrix & Token Based Systems
BAST - 504	**C- UID** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** The User Interface **Unit II:** Design process **Unit III:** System menus and navigation schemes **Unit IV:** Screen based controls
SECCAST - 507	**ARTIFICIAL INTELLIGENCE** (CREDITS:01; TOTAL HOURS:)	**Unit I:** Overview of AI **Unit II:** Research areas of AI **Unit III:** Expert systems **Unit IV:** Robotics

Semester VI

Code	Name of Course	Units
BAST - 601	**2D GAME DEVELOPMENT** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Introduction of Game Programming **Unit II:** Getting with the program **Unit III:** Interactive coding **Unit IV:** Ten math concept for Game Development
BAST - 602	**MARKETING MANAGEMENT** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Market Analysis and Selection **Unit II:** Products & Price **Unit III:** Selection, Distribution & Advertising **Unit IV:** Market Research, Organisation & Control
BAST - 603	**DYNAMICS & RENDERING** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Paint Effects, Toon shading **Unit II:** Lighting with Mental ray and Shading Techniques **Unit III:** Rendering for compositing and introducing nparticles **Unit IV:** Dynamic Effects
BAST - 604	**A-3D PRINTING IN ANIMATION** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Introduction **Unit II:** Liquid Based 3D Printing **Unit III:** Object manufacturing process **Unit IV:** Solid Based 3D Printing
BAST - 604	**B- AR FOR ANIMATION** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Introduction of Augmented Reality **Unit II:** Current State of Augmented Reality **Unit III:** Assessing the Future of Augmented Reality **Unit IV:** Exploring Augmented Reality
BAST - 604	**C - VR FOR ANIMATION** (CREDITS:02; TOTAL HOURS:45)	**Unit I:** Introduction to Virtual Reality **Unit II:** Representing the Virtual World **Unit III**: The Geometry of Virtual Worlds &The Physiology of Human Vision **Unit IV:** Visual Perception & Rendering
SECCAST - 607	**ENTREPRENEURSHIP DEVELOPMENT** (CREDITS:01; TOTAL HOURS:)	**Unit I:** Entrepreneurship **Unit II:** Types of Enterprises and Ownership Structure **Unit III:** Management of Enterprises **Unit IV:** Projects

Semester – V

Course –BAST-501: 3D MAYA RIGGING & ANIMATION

Course Objectives: Student will be able to

1. Recognize tools and techniques of Maya rigging.
2. Classify principles of animation for 3D Animation.
3. analyse Maya lighting parameters and values
4. Understand mental ray, V- ray or Arnold renderer.

Credits (Total Credits 2)	SEMESTER-V BAST-501 3D MAYA RIGGING & ANIMATION	No. of hours per unit/credits
UNIT - I	**Types and techniques of rigging**	**(11)**
	Basic study Elements of Rigging tools, constrains and types ,Understanding Rigging, Creating and Organizing Joint Hierarchies, Orienting Joints, Naming Joints, Mirroring Joints, Rigging the Giraffe, IK Legs, FK Blending, Rotate Plane Solvers, Creating Custom Attributes, Spline IK, Full Body Inverse Kinematics, Skinning Geometry, Interactive/Smooth Binding, Painting Skin Weights	
UNIT - II	**Procedural 3D Animation**	**(11)**
	Introduction to Animation tools – Principles of Animation, Using Joints and Constraints, Inverse Kinematics, Driven Keys ,Key frame Animation, Graph Editor, Play blast and F-Check, , Animation Using Expressions, Motion Path Animation, Animating Constraints, Animation Layers, ,Animating Facial Expressions Using Blend Shapes, Animating with Lattices, Animating Object Components with Clusters, Animating a Scene Using Nonlinear Deformer	
UNIT - III	**3D Lighting**	**(12)**
	Introduction to light, Principle of light Types of light – Shadows – Types of Shadows – Understanding material & lights – Software Lighting – Mental ray lighting –Final Gather – Global illumination – Caustics -- Vray lighting – HDRI – SSS Shader	
UNIT - IV	**Types and techniques of Rendering**	**(11)**
	Introduction to Rendering – Render layers - Software Rendering – Mental ray Rendering – Types of Render passes – Diffuse Passes – Specular passes – Shadow passes – Occlusion passes – Use Background matting	

Course outcomes: Student should be able to

1. Classify and Compare types of 3D Rigging.
2. Understand and analyse IK and Fk Rigging.
3. Inferred and apply principles of animation for character animation.
4. Produce 3D Design and animation using rendering parameters.

References-

1. Kelly L. 23 May 2018. “Types and techniques of rigging.” Title: 3Ds Maya Bible , edited by Kelly L, Pages: 1 to 130. America: John Wiley & Sons. ISBN-10 : 076453645
2. Kelly L, May 2022, Title:-"Autodesk Maya 2022 Basics Guide" edited by Murdock ,Pages: 89to 213. America:
3. Prof. Sham Tickoo Purdue, (August 1, 2021) Title:-"Autodesk Maya 2022" Univ. and CADCIM Technologies, Pages: 217 to 341, Publisher Kindle ASIN : B09BPVC9HG
4. Boughen, Nicholas17 January 2018 ,"3Ds Maya Lighting"- edited by by Boughen, Nicholas, America, Publisher- Wordware Publishing Inc

Course –BAST-502: ROTOSCOPING

Course Objectives: Student will be able to

1. Understand use of rotoscoping for project
2. Understand Interface of Silhouette.
3. Inferring plugins for rotoscoping
4. Comparing task between Silhouette and Mocha pro

Credits (Total Credits 2)	**SEMESTER-V** BAST-502 **ROTOSCOPING**	**No. of hours per unit/credits**
UNIT - I	**Introduction to Roto**	**(11)**
	Origins of Roto, Modern Roto, Roto Tools, Introduction, Silhouette feature, Installation and Licensing, Interface of Silhouette, Creating a Project, Creating Sessions, Compositing and Multiple Nodes , Menu Bar, Trees, Timeline, Object List, Sequence editor, Roto Node, Time line, Parameters.	
UNIT - II	**Working with various Nodes**	**(11)**
	Roto Node, Tracker, Paint Node, Color Node, Composite Node, Key, Motion Blur, Paint Node, Power matte Node, Composite node, Morphing, zMatte, Depth, ROI (Region of Interest), All Nodes, and Render, Render option, Preview.	
UNIT - III	**Rotoscoping with Mocha Pro**	**(12)**
	Introduction of Mocha pro, Mocha pro Feature, Interface of Mocha pro, Stereo Interface, Using mocha pro plugins, Starting new project, Merging and importing projects, Tracking Basics, Stereo Tracking, Adjust track, Rotoscoping Basics, Rotoscoping with Magnetic and Freehand tools.	
UNIT - IV	**Rendering and Final Output**	**(11)**
	Stereo Rotoscoping, Exporting Tracks, Exporting Mattes and clip, The camera Solve Module, the insert module, the mega clean plates in the Remove module, the Remove Module, The stabilize Module, the lens Module, Using Mocha Pro for 360Vr Workflow, The reorient Module, The Dope Sheet And Curve Editor, The Clip tab, Preferences, File format.	

Course outcomes: Student should be able to

1. Understand trends of VFX industry.
2. Demonstrate various techniques used in the VFX production
3. Creating rotos for a variety of high level of detail.
4. Create various Rotoscoping production using modules.

References-

1. Benjamin Bratt, “Rotoscoping Techniques and Tools for the Aspiring Artist”, 24 February 2011
2. Silhouette v7.5 User Guide (anonymous)
3. Mocha pro 2020 User guide (anonymous)
4. Jon Gress, “Digital Visual Effects & Compositing Book”,13 October 2014

Course –BAST-503: Computer Based 2D Animation

Course Objectives: Student will be able

1. Understand 2D traditional pre-production and production process.
2. Understand the system of columns and levels in detail.
3. Understand freeware applications for making animation.
4. Create drawings for traditional & digital 2D animation production.

Credits (Total Credits 2)	**SEMESTER-V** BAST-503: Computer Based 2D Animation	**No. of hours per unit/credits**
UNIT - I	**Production Workflow & Interface**	**(11)**
	Traditional Workflow, Paperless Workflow, Interface Overview, Using Rooms, Room Panes, Customizing the Interface Appearance, Managing Projects, Setting up Projects, Setting Up a Scene, Scanning Paper Drawings, Saving and Loading Cleanup Settings	
UNIT - II	**Drawing Tools & Applying Effects**	**(11)**
	Drawing Animation Levels, Drawing Tools, Changing the Canvas Size, Editing Drawings, Animation Techniques, Editing Animation Levels, Applying Effects, Create animations using Plastic tool	
UNIT - III	**Palettes and Styles**	**(12)**
	Managing Palettes and Styles, The Palette Editor, Animating Palettes, Editing Styles, Painting Tools, Using a Color Model, Working in Xsheet/Timeline	
UNIT - IV	**Working with Rendering**	**(11)**
	Working with Columns/Layers, Working with Cells, Working Globally with Frames, Creating a Soundtrack, Lip Syncing, Saving and Loading Scenes, Creating Movements, Using the Skeleton Tool, Previewing and Rendering	

Course outcomes: Student should be able to

1. understand concepts, storyboarding and production pipeline of 2 dimensional animations.
2. Implement Principles of animation for 2D animation project.
3. create and apply sfx effects for 2D Animation project.
4. Create 2D animation render video.

References-

1. OpenToonz Documentation Release 1.6.0, Oct 16, 2022 (anonymous)
2. ToonzPaperlessWorkflow, for Toonzharlequin & ToonzBravo
3. Preston Blair, "Cartoon Animation with Revised Edition, Learn techniques for drawing and animating cartoon characters", November 2020
4. Steve Roberts, "Character Animation Fundamentals: Developing Skills for 2D and 3D Character Animation", 20 September 2011

Course –BAST-504: A: Market Research

Course Objectives: Student will be able to

1. Understand fundamental principles, concepts and measurement tools for Market Research planning.
2. Understand market research logic and systematic manner.
3. Recognized difference between qualitative and quantitative research methods.
4. Understanding of the content of practical market research project.

Credits (Total Credits 2)	**SEMESTER-V** BAST-504: A: Market Research	**No. of hours per unit/credits**
UNIT - I	**Marketing Research-Basic understanding**	**(11)**
	Meaning of Marker Research & Marketing Research, Role of Marketing Research in Marketing Management, process of Marketing Research, Ethical Issues in Marketing Research, Nature & contents of Ethical Issues	
UNIT - II	**Branches of Marketing Research**	**(11)**
	Consumer Research - Meaning & Scope, Need, Functions. Product Research - Meaning & Scope, Importance. Advertising Research - What to Test, When to Test. Media Research - Functions of Media Research. Motivational Research - Meaning uses & Limitations. Techniques - Marketing Research in India	
UNIT - III	**Marketing Research Proposal & Design & Scales of Measurement**	**(12)**
	Marketing Research Proposal – Meaning, Elements of Research Proposal. Marketing Research Design – Its Meaning, Its Importance, Types of Research Design, Criteria of good Research Design. Scales of Measurement – Meaning of Measurement in Marketing Research, criteria of sound Measurement of Marketing Research	

UNIT - IV	Sampling in Marketing Research & Marketing Research Report	(11)
	Meaning of sampling, steps of sampling process, Types of sampling plans, Meaning of Marketing Research Report, writing criteria of Marketing Research Report, Proforma / Format of a Market Research Report, Types of Research Report	

Course outcomes: Student should be able to

1. define the basic concepts related to marketing research.
2. explain the concepts about contemporary marketing research.
3. create concrete plan of market research for a particular business..
4. explain relationship and differences between marketing research and marketing information systems.

References-

1. S. A. Chunawala, "Essentials of Marketing Research", Himalaya Publishing House.
2. B. S. Goel, " Marketing Research", - Pragati Prakashan, Meerut (UP)
3. Kotler, Keller, Koshy, Jha, "Marketing Management", (13th Edition Pearson.)
4. Lawrence Silver and Robert E Stevens, "The Essentials of Marketing Research", 18 October 2012

Course –BAST-504: B: E-commerce

Course Objectives: Student will be able to

1. Understand the basic concepts and technologies used in the field of management information systems.
2. Have the knowledge of the different types of management information systems.
3. Understand the processes of developing and implementing information systems.
4. Be aware of the ethical, social, and security issues of information systems.

Credits (Total Credits 2)	**SEMESTER-V** BAST-504: B: E-commerce	**No. of hours per unit/credits**
UNIT - I	**Over view of E-Commerce**	**(11)**
	The Backbone for E-Commerce: Early Ages of Internet; Networking Categories; Characteristics of Internet; Components of Internet – Internet Services, Elements of Internet, Uniform Resource Locators, Internet Protocol; Shopping Cart, ESecurity: Security on the Internet; Network and Website Security Risks – Denial-ofService attacks, Viruses, Unauthorized access to a computer network; Vulnerability of Internet Sites.	
UNIT - II	**Trends & Issues of E-commerce**	**(11)**
	Internet Service Provider (ISP); World Wide Web (WWW); Portals – Steps to build homepage, Metadata; Advantages of Portal; Enterprise Information Portal (EIP). Implementation of E-Commerce: WWW.EBAY.COM - B2C Website – Registration, Time factor, Bidding process, Growth of ebay; paypal – New Trend in Making Payments Online; National Electronic Funds Transfer.	
UNIT - III	**Web Services & Technology**	**(12)**
	Defining Commerce; Main Activities of Electronic Commerce; Benefits of ECommerce; Broad Goals of Electronic Commerce; Main Components of E-Commerce; Functions of Electronic Commerce – Communication, Process of E-Commerce; Types of E-Commerce; Role of Internet and Web in E-Commerce; Technologies Used; ECommerce Systems.	
UNIT - IV	**Modes, Matrix & Token Based Systems.**	**(11)**
	Various Activities of E-Commerce; Various Modes of Operation Associated with ECommerce; Matrix of E-Commerce Types; Elements and Resources Impacting ECommerce and Changes, E-Payment Systems: Electronic Funds Transfer; Digital Token Based E-Payment Systems; Modern Payment Systems; Steps for Electronic Payment; Payment Security; Net Banking.	

Course outcomes: Student should be able to

1. Demonstrate an understanding of the foundations and importance of E-commerce - Demonstrate an understanding of retailing in E-commerce by
2. Analysing branding and pricing strategies, Using and determining the effectiveness of market research.
3. Assessing the effects of disintermediation.
4. Analyse the impact of E-commerce on business models and strategy.

References-

1. David Whiteley, "E – Commerce: Strategy, Technologies and Applications", 1 July 2017
2. P T Joseph, "E-Commerce: An Indian Perspective", 15 December 2006
3. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley, 20 November 2001
4. Datta and Somani, "E-COMMERCE & BUSINESS COMMUNICATION", Second edition, 1 December 2018

Course –BAST-504: C: UID (User Interface Design)

Course Objectives: Student will be able to

1. Understand the User Interface design.
2. Study on the concept of menus, windows and interfaces.
3. Study the characteristics and components of windows and the various controls for the windows
4. Study on problem solving methods and testing methods of windows design with color, text and graphics.

Credits (Total Credits 2)	**SEMESTER-V** BAST-504: C: UID (User Interface Design)	**No. of hours per unit/credits**
UNIT - I	**The User Interface**	**(11)**
	Introduction, Overview, The importance of user interface – Defining the user interface, The importance of Good design, Characteristics of graphical and web user interfaces, Principles of user interface design	
UNIT - II	**Design process**	**(11)**
	Obstacles, Usability, Human characteristics in Design, Human Interaction speeds, Business functions-Business definition and requirement analysis, Basic business functions, Design standards.	
UNIT - III	**System menus and navigation schemes**	**(12)**
	Structures of menus, Functions of menus, Contents of menus, Formatting of menus, Phrasing the menu, Selecting menu choices, Navigating menus, Kinds of graphical menus. Windows - Characteristics, Components of window, Window presentation styles, Types of window, Window management, Organizing window functions, Window operations, Web systems, Characteristics of device based controls.	
UNIT - IV	**Screen based controls**	**(11)**
	Operable control, Text control, Selection control, Custom control, Presentation control, Windows Tests-prototypes, kinds of tests.	

Course outcomes: Student should be able to

1. Create connection between menus and windows.
2. Operate speed & business functions of relevance design standards and guidelines.
3. Design and construct prototypes with different levels of fidelity.
4. Create Corporate level designs for android or windows applications.

References –

1. Wilbert O. Galitz, "The Essential Guide to User Interface Design", John Wiley & Sons, Second Edition 2002.
2. Ben Sheiderman, "Design the User Interface", Pearson Education, 1998.
3. Alan Cooper, "The Essential of User Interface Design", Wiley- Dream Tech Ltd.,2002
4. Theo Mandel, "The Elements of User Interface Design", 7 March 1997

Course – SECCAST – 507: Artificial Intelligence

Course Objectives: Student will be able to

1. understand the concepts of Artificial Intelligence.
2. illustrate the methods of solving problems using Artificial Intelligence.
3. understand the knowledge representation techniques, reasoning techniques and planning.
4. understand the concepts of Expert Systems and machine learning.

Credits (Total Credits 2)	**SEMESTER-V** SECCAST – 507: Artificial Intelligence	**No. of hours per unit/credits**
UNIT - I	**Overview of AI**	**(11)**
	What is Artificial Intelligence? , Philosophy of AI, Goals of AI , What Contributes to AI? , Programming Without and With AI, What is AI Technique? , Applications of AI, History of AI. What is Intelligence? , Types of Intelligence, What is Intelligence Composed of? , Difference between Human and Machine Intelligence	
UNIT - II	**Research areas of AI**	**(11)**
	Real Life Applications of Research Areas, Task Classification of AI, Artificial Intelligence What are Agent and Environment? , Agents Terminology, Rationality, What is Ideal Rational Agent? ,The Structure of Intelligent Agents, the Nature of Environments, Properties of Environment.	
UNIT - III	**Expert systems**	**(12)**
	Overview of Search Algorithm, What are Expert Systems? , Capabilities of Expert Systems, Components of Expert Systems Knowledge Base , Inference Engine ,User Interface , Expert Systems Limitations, Applications of Expert System , Expert System Technology , Development of Expert Systems: General Steps ,Benefits of Expert Systems.	
UNIT - IV	**Robotics**	**(11)**
	What are Robots? , What is Robotics? , ,Robot Locomotion , Components of a Robot , Artificial Intelligence in Robotics, Computer Vision ,Tasks of Computer Vision ,Application Domains of Computer Vision ,Applications of Robotics , What are Artificial Neural Networks (ANNs)? , Basic Structure of ANNs, Types of Artificial Neural Networks, Applications of Neural Networks	

Course outcomes: Student should be able to

1. understand the informed and uninformed problem types and apply search strategies to solve them.
2. design and evaluate intelligent expert models for perception and prediction from intelligent environment.
3. demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area.
4. formulate valid solutions for problems involving uncertain inputs or outcomes by using decision making techniques.

References-

1. Artificial Intelligence: Elaine Rich, Kevin Knight, TMH, 2nd Edition.
2. Artificial Intelligence: Structures and Strategies for Complex Problem solving: George F Luger, 4th Ed., Pearson Education, Asia.
3. Introduction to Artificial Intelligence and Expert Systems: D. W. Patterson, PHI, 2nd Edition.
4. "Applied Artificial Intelligence: A Handbook for Business Leaders" Mariya Yao, Adelyn Zhou, Marlene Jia

ANIMATION SCIENCE LAB (BASP-508)

(BAST – 501 + BAST – 502)

3D MAYA RIGGING & ANIMATION + ROTOSCOPHY

Course Objectives: Student will be able to

1. Understand Maya rigging and character overview.
2. Understand Inverse kinematics and forward kinematics.
3. Understand construction of bone system with painting Skin weight
4. Understand Silhouette FX Roto techniques.

Credits (Total Credit 04)	**SEMESTER-V** **ANIMATION SCIENCE LAB - (BASP-508)** **(BAST – 501 + BAST – 502)** **3D MAYA RIGGING & ANIMATION + ROTOSCOPING**	**No. of hours per unit/credits**
Group-I	1. Character setup overview with Building and posing skeleton. 2. Creating basic rig Bone System and Applying Fk and IK solvers. 3. Skinning and painting Skin weight. 4. Constraint. 5. Deformers 6. Rigging Male or female body 7. Rigging Animal body 8. Creating architectural walkthrough with lighting 9. Create a basic walk cycle 10. Animating Facial Expression in 3d maya.	4
Group-II	1. Point Track in Silhouette FX Roto. 2. Planer Track in Silhouette FX Roto. 3. Mocha Track in Silhouette FX Roto. 4. Stereo (3d conversion) Rotoscoping in Silhouette FX Roto (Output in Color, Grey, Alpha). 5. VFX (Green Screen Croma) Rotoscoping in Silhouette FX Roto (Output in Color, Grey, Alpha). 6. Clean plate in Silhouette FX Roto. 7. Motion Blur in Rotoscoping in Silhouette FX Roto. 8. Basics of the Remove Module With mocha pro. 9. Tracking and Screen Replacement with Mocha for After effect. 10. Stabilize 360 video with Mocha pro.	4

Course outcomes-Students should be able to

1. Create bone rig and constraint.
2. Formulate parameters of camera using Chanel box.
3. Create and render scene using render attribute.
4. create special effect using Point Track in Silhouette FX Roto.

References-

1. 1. Kelly L. 23 May 2018. “Types and techniques of rigging.” Title: 3Ds Maya Bible , edited by Kelly L, Pages: 1 to 130. America: John Wiley & Sons. ISBN-10 : 076453645
2. Kelly L, May 2022, Title:-"Autodesk Maya 2022 Basics Guide" edited by Murdock ,Pages: 89to 213. America:
3. Benjamin Bratt, “Rotoscoping Techniques and Tools for the Aspiring Artist”, 24 February 2011
4. Jon Gress, “Digital Visual Effects & Compositing Book”,13 October 2014

ANIMATION SCIENCE LAB (BASP-509)

(BAST – 503 + BAST – 504)

Computer Based 2D Animation + A-Market Research/ B: E-commerce/ C: UID (User Interface Design)

Course Objectives: Student will be able to

1. study the concept of menus, windows, interfaces.
2. To study about business functions.
3. Create scene in Open toonz animate image with mesh objects for project.
4. Understand methods and philosophical debates surrounding empirical research.

redits (Total Credit 04)	**SEMESTER-V** **ANIMATION SCIENCE LAB - (BASP-509)** **(BAST – 503 + BAST – 504)** **Computer Based 2D Animation + A-Market Research/ B: E-commerce/ C: UID (User Interface Design)**	**No. of hours per unit/credits**
Group-I	1. Tracing characters and backgrounds with different layers in opentoonz. 2. Eye blinking & lip synchronization in opentoonz. 3. Facial expressions dialogue. 4. Parallax camera movement animation with mountain view & city. 5. Basic human walk cycle. 6. Basic Animal walk cycle. 7. Sneak Thief walk cycle. 8. Human run cycle. 9. Animal run cycle. 10. Create a scene with action & dialogue.	4
Group-II	**A-Market Research** 1. Discuss briefly the meaning of marketing research. Explain its significance in Modern times. 2. What are the limitations of marketing research? 3. Explain in details the process of marketing research? 4. Discuss in detail ethical issues in Marketing Research. 5. Briefly describe steps involved in Marketing Research. 6. Discuss different types of sampling methods. 7. Discuss in detail various methods of probability and no probability sampling. 8. What different types of personal interviewing methods are used in marketing research? 9. Describe the problems of Indian Rural market. 10. Discuss the difference between cross-sectional & longitudinal research designs.	4

B: E-commerce

1. What is e-commerce and early ages of internet; networking categories.
2. Explain characteristics of internet; components of internet – internet services, elements of internet.
3. E-security: security on the internet; network and website security risks 4. Denial-of-service attacks, viruses, unauthorized access to a computer network; vulnerability of internet sites.
5. Steps to build homepage, metadata; advantages of portal; enterprise information portal.
6. Implementation of e-commerce: www.ebay.com - b2c website – registration, time factor, bidding process,
7. Growth of eBay; PayPal – new trend in making payments online; national electronic funds transfer. 23 | P a g e
8. Defining ecommerce; main activities of electronic commerce; benefits and goals of ecommerce;
9. Process of e-commerce; types of e-commerce
10. Role of internet and web in e-commerce; technologies used; e-commerce systems & Various activities of e-commerce.

C: UID (User Interface Design)

1. Study on Identifying interface connectivity and establishing interface connectivity between two different program modules.

2. Study on Understand front end and back end interfacing and implementation of both interfacing.

3. Study on Identifying & Practical implementation of interaction design and functional layout.

4. Study on Identifying and analyze “what is navigation design” and implementing of navigation design.

5. Study on Create a working UI prototype using prototyping tool.

6. Study and analysis of sharing and exploring the UI design.

7. Study about custom control and operational control their working and tool used.

8. Study about implementation of information search module using UI.

9. Study and analysis of navigation design and its implementation.
10. Study on creating social media advertisement using online tools and applications.

Course outcomes-Students should be able to

1. Create & design some user designed principles for user interface design.
2. Study different interaction styles.
3. Study & describe the user support which should be built-in to user interface.
4. Study on usability attributes & system approaches.

References-

1. Wilbert O. Galitz, "The Essential Guide to User Interface Design", John Wiley & Sons, Second Edition 2002.
2. Steve Roberts, "Character Animation Fundamentals: Developing Skills for 2D and 3D Character Animation", 20 September 2011
3. Alan Cooper, "The Essential of User Interface Design", Wiley- Dream Tech Ltd.,2002
4. Marketing Management by Kotler, keller, Koshy, Jha, (13th Edition Pearson.)

ANIMATION SCIENCE LAB (BASP-510)

Numerical Skill

Course Objectives: Student will be able to

1. understand the concepts of Artificial Intelligence.
2. illustrate the methods of solving problems using Artificial Intelligence.
3. understand the knowledge representation techniques, reasoning techniques and planning.
4. understand the concepts of Expert Systems and machine learning.

Credits (Total Credit 04)	**SEMESTER-V** **ANIMATION SCIENCE LAB - (BASP-510)** **Numerical Skill**	**No. of hours per unit/credits**
Group-I	1. Algorithm to print the given number is even or odd. 2. Algorithm to prime the number is prime or not. 3. Algorithm to print factorial of a number. 4. Algorithm to print multiplication of table. 5. Algorithm to print Specified structure using special character. 6. Figure out and explain Applications of AI. 7. Illustrate Importance of AI. 8. Enlist various sectors explore with AI.	4

Course outcomes-Students should be able to

1. understand the informed and uninformed problem types and apply search strategies to solve them.
2. design and evaluate intelligent expert models for perception and prediction from intelligent environment.
3. demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area.
4. formulate valid solutions for problems involving uncertain inputs or outcomes by using decision making techniques.

References-

1. Artificial Intelligence: Elaine Rich, Kevin Knight, TMH, 2nd Edition.
2. Artificial Intelligence: Structures and Strategies for Complex Problem solving: George F Luger, 4th Ed., Pearson Education, Asia.
3. Introduction to Artificial Intelligence and Expert Systems: D. W. Patterson, PHI, 2nd Edition.
4. "Applied Artificial Intelligence: A Handbook for Business Leaders" Mariya Yao, Adelyn Zhou, Marlene Jia

ANIMATION SCIENCE LAB (BASP-511)

Project Lab

Distribution of project lab marks

Sem V (50 Marks) + Sem VI (50Marks) =100 Marks

Sem V (50 Marks)

Pre-production and Industrial Training (Total 50 Marks)

15 – Pre production work
10- Production Project Report
05- Marks for industrial visit / Excursion (Educational Tour)/Seminar in Semester V
10- Case Study/Educational Tour/Seminar/Training/ Scientific Writing
10- Day to day Performance

Course –BAST-601: 2D GAME DEVELOPMENT

Course Objectives: Student will be able to

1. Memorize programming and flash gaming pre-production pipeline.
2. Understand use of adobe flash for real time applications.
3. Remember Keyboard Input and Audio Output.
4. Understand apply the concepts for game development.

Credits (Total Credits 2)	SEMESTER-VI BAST-601: 2D GAME DEVELOPMENT	No. of hours per unit/credits
UNIT - I	**Introduction of Game Programming**	**(11)**
	Designing and Writing Games - Making artificial worlds , The importance of interactivity ,Games are about objects, Players compete with the programmer . Game Programming Comparing ActionScript with Animation ,Making a playable game ,Starting with a plan ,Learning to code. Game Programming - Selecting a language, Planning tasks Cruising and Using the Flash Environment : Writing on the Flash Stage, Testing your program, Making a Web page with your creation. Building a button , Introducing the Library , Adding state to your button , Finishing your button, Adding code to the button ,Understanding the code .	
UNIT - II	**Getting with the program**	**(11)**
	Altered States -State of no confusion, Adding Key frames, Building the Green Grass game, Planning your game , Setting the stage ,Getting with the Program :Different Text for Different Jobs -Static text , Dynamic text , Input text Building the Greeting Program -Adding text fields to the Stage, Associating variables with text boxes, Changing a text box through code ,Reading information from an input text box.	
UNIT - III	**Interactive coding**	**(12)**
	Introducing the Math Game,Building the Visual Design-Designing the choose page, Designing the solve page ,Designing the report page Coding the Pages - Coding the choose page ,Coding the solve page ,Coding the report page . Coping with Bugs and Crashes , Syntax error .	

	Keyboard Input and Audio Output ,Responding to the Keyboard -Trolling for key presses ,Examining keyboard input ,Working with the Key object , Adding a keyboard handler . Adding Sounds - Getting sound effects ,Considering audio compression .	
UNIT - IV	**Ten Math Concepts for Game development.**	**(11)**
	Managing Velocity, Accelerating an Object, Calculating a Distance, Projecting a Vector, Generating a Vector, Compensating for Gravity, Newton's Second Law, Generating a Random Integer, Combining Vectors, Sophisticated Vehicle Motion. Ten Game Starters: Asteroids, Lunar Lander, Egg Cannon, Zelda, Platform Scroller Games,Breakout, Space Invaders, Orbit Matcher, Tile-Based World Games, Whack-an-Author.	

Course outcomes: Student should be able to

1. Design characters, background grounds, colour scheme, Game storyboards and basic audio requisites for Gaming industry
2. analyze the concepts of programming for game development.
3. apply action script 3.0 for game development.
4. create game for PC and mobile (Android).

References-

1. Beginning Flash Game Programming For Dummies-Andy Harris
2. Game Coding Complete – 4th Edition-By Mike McShaffry and David Graham
3. ADOBE flash CS6 User Manual.(anemones)
4. Flash professional CS6-Katherine Ulrich.(anemones)

Course –BAST-602: MARKETING MANAGEMENT

Course Objectives: Student will be able to

1. understand the fundamental concepts and role of Marketing.
2. understand marketing concepts and its application to different markets.
3. identify factors & processes essential for designing marketing strategies.
4. study marketing concepts & strategy to firms.

Credits (Total Credits 2)	SEMESTER-VI BAST-602: MARKETING MANAGEMENT	No. of hours per unit/credits
UNIT - I	**Market Analysis and Selection**	**(11)**
	Introduction: Concept, nature, scope and importance of marketing; Marketing concept and its evolution; Marketing mix; Strategic marketing planning – an overview. Market Analysis and Selection: Marketing environment – macro and micro components and their impact on marketing decisions; Market segmentation and positioning; Buyer behaviour; consumer versus organizational buyers; Consumer decision making process.	
UNIT - II	**Products & Price**	**(11)**
	Product Decisions: Concept of a product; Classification of products; Major product decisions; Product line and product mix; Branding; Packaging and labelling; Product life cycle – strategic implications; New product development and consumer adoption process. Pricing Decisions: Factors affecting price determination, Pricing policies and strategies; Discounts and rebates.	
UNIT - III	**Selection, Distribution & Advertising**	**(12)**
	Distribution Channels and Physical Distribution Decisions: Nature, functions, and types of distribution channels; Distribution channel intermediaries; Channel management decisions; Retailing and wholesaling. Promotion Decisions: Communication Process; Promotion mix – advertising, personal selling, sales promotion, publicity and public relations; Determining advertising budget; Copy designing and testing; Media selection; Advertising effectiveness; Sales promotion – tools and techniques.	
UNIT - IV	**Market Research, Organisation & Control**	**(11)**
	Marketing Research: Meaning and scope of marketing research; Marketing research process. Marketing Organisation and Control: Organising and controlling marketing operations	

Course outcomes: Student should be able to

1. understand the marketing theories, frameworks & tools .
2. understand marketing strategies & problem solve marketing problems.
3. examine marketing concepts & phenomenon to current business events in industry.
4. practice marketing communication skills relevant to the corporate world.

References-

1. Kotlar, Philip, Marketing Management, Prentice Hall, New Delhi.
2. Stanton, Etzel, Walker, Fundamentals of Marketing, Tata-McGraw Hill, New Delhi.
3. Vibrant Publishers , Callie Daum, "Marketing Management Essentials You Always Wanted To Know" (Self-Learning Management Series), 1 January 2020
4. Rajan Saxena, "Marketing Management", 6th Edition, 16 November 2019

Course –BAST-603: DYNAMICS & RENDERING

Course Objectives: Student will be able to

1. understand process of creating environment using paint effect.
2. identify types and uses of lighting.
3. recognize types of Maya and external render.
4. understand process of simulation using n-particles animation.

Credits (Total Credits 2)	SEMESTER-VI BAST-603: DYNAMICS & RENDERING	No. of hours per unit/credits
UNIT - I	**Paint Effects, Toon shading**	**(11)**
	Using the Paint Effects Canvas, Painting on 3D Objects, Understanding Strokes, Designing Brushes, Create Complexity by Adding Strokes to a Curve, Shaping Strokes with Behaviour Controls, Animating Strokes, Rendering Paint Effects, Using Toon Shading.	
UNIT - II	**Lighting with Mental ray and Shading Techniques**	**(11)**
	Shadow-Casting Lights, Indirect Lighting: Global Illumination, Indirect Lighting: Global Illumination, Image-Based Lighting, Physical Sun and Sky, Light Shaders, Shading Concepts, Creating Blurred Reflections and Refractions Using Standard Maya Shaders, Basic mental ray shaders, Car Paint Materials, The MIA Material.	
UNIT - III	**Rendering for compositing and Introducing nparticles**	**(12)**
	Render Layers, Render Passes, Render Pass Contribution Maps, Setting Up a Render with mental ray, Mental ray Quality Settings, Using Fluid Containers, Creating a Reaction, Rendering Fluid Container, Create Fluids and nparticle Interactions. Creating nparticles, Making nparticles Collide with ncloth Surfaces, Using nparticles to Simulate Liquids, Using Wind, Shading nparticles and Using Hardware Rendering To Create Flame Effects, Rendering Particles with mental ray.	
UNIT - IV	**Dynamic Effects**	**(11)**
	Creating ncloth Objects , Creating ncloth and nparticle Interactions , Rigid Body Dynamics, Creating Smoke Trails, Adding Fur to Characters, Rendering Fur Using mental ray, Adding Hair to a Character, Rendering Hair, Creating Clothing for Characters.	

Course outcomes: Student should be able to

1. understand rendering techniques and effects.
2. execute toon shading and mental ray shaders for maya projects.
3. simulate n-particles for real world animation.
4. Create fur, hair and clothes animation using dynamics.

References-

1. Prof. Sham Tickoo Purdue, (August 1, 2021) Title:-"Autodesk Maya 2022" Univ. and CADCIM Technologies, Pages: 217 to 341, Publisher Kindle ASIN : B09BPVC9HG
2. Boughen, Nicholas17 January 2018 ,"3Ds Maya Lighting"- edited by by Boughen, Nicholas, America, Publisher- Wordware Publishing Inc

3. Roger King, "3D Animation for the Raw Beginner Using Autodesk Maya", 14 February 2019

4. Alias Learning Tools, Doug Walker, "Learning Maya 7: The Special Effects Handbook", 21 October 2005

Course –BAST-604: (A) 3D Printing in Animation

Course Objectives: Student will be able to

1. recognize fundamentals of various 3D Printing Techniques for application to various industrial needs.
2. understand the method of 3D modelling.
3. understand software tools for 3D printing.
4. understand the working principal for 3D printing.

Credits (Total Credits 2)	SEMESTER-VI BAST-604: (A) 3D Printing in Animation	No. of hours per unit/credits
UNIT - I	**Introduction**	**(11)**
	Introduction to Design, Prototyping fundamentals. Introduction to 3D printing, its historical development, advantages. Commonly used terms, process chain, 3D modelling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, RP data formats, Classification of 3D printing process, Applications to various fields.	
UNIT - II	**Liquid Based 3D Printing**	**(11)**
	Stereo lithography apparatus (SLA): Models and specifications, process, working principle, photopolymers, photo polymerization, layering technology, laser and laser scanning, applications, advantages and disadvantages, case studies. Solid ground curing (SGC): Models and specifications, process, working ,principle, applications, advantages and disadvantages	
UNIT - III	**object manufacturing process**	**(12)**
	Laminated object manufacturing(LOM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages,	
UNIT - IV	**Solid Based 3D Printing**	**(11)**
	Fused Deposition Modeling (FDM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies, practical demonstration	

Course outcomes: Student should be able to

1. recognize principles of 3D printing modules.
2. understand process of 3D printing.
3. Create 3D models for 3D printing.
4. Design and print objects containing moving parts without assembly

References-

1. Motion Graphic Design: Applied History and Aesthetics. Author: Jon Krasner. ISBN: 9780240809892. Publisher: Focal Press.

2. Premiere Pro CS6 Digital Classroom. Author: Jerron Smith, AGI Creative Team. ISBN: 9781118553008. Publisher: John Wiley & Sons, 2012.

3. Mastering Autodesk Maya 2015, Author-Tood Palmar

4. Mastering Autodesk Maya 2011 by Eric Keller.

Course –BAST-604: (B) AR for Animation

Course Objectives: Student will be able to

1. Define Augmented Reality.
2. Understand the current state of augmented Reality in various devices.
3. Discuss the futures changes in AR and Mobile Apps for Experiencing Augmented Reality.
4. Identify the transformation in various industries due to Augmented Reality.

Credits (Total Credits 2)	SEMESTER-VI BAST-604: (B) AR for Animation	No. of hours per unit/credits
UNIT - I	**Introduction of Augmented Reality**	**(11)**
	Defining Augmented Reality, Some Other Types of Reality-Mixed reality, Augmented virtuality, Extended reality, History of Augmented Reality, Augmented reality hits the mainstream, Evaluating the Technology Hype Cycle. Form factors-Cost and availability, Perceived usefulness, Tracking, Field of view, Visuals, Assessing Adoption Rates.	
UNIT - II	**Current State of Augmented Reality**	**(11)**
	Mobile devices, AR headsets, AR glasses, Considering Controllers-Touch, Gaze, Keyboard and mouse, Voice, Hand tracking, Motion controllers, Recognizing the Current Issues with Augmented Reality. Identifying Near-Future Hardware Heads-up displays AR devices Comparing Current and Future Options	
UNIT - III	**Assessing the Future of Augmented Reality**	**(12)**
	Analyzing Near Future Changes-Evaluating the market, Considering AR's "Killer App", Predicting the Impact Mobile Apps for Experiencing Augmented Reality-Google Translate, Amazon AR View, Blippar, AR City, ARise, Ingress and Pokémon Go, MeasureKit and Measure, InkHunter, Sketch AR.	
UNIT - IV	**Exploring Augmented Reality**	**(11)**
	Use Cases-Art, Education, Industry and Commerce, Entertainment Industries That Will Be Transformed ***by*** Augmented Reality-Travel,Museums,Aerospace,Retail,Military,Education,Entertainment,Real Estate Advertising and Marketing.	

Course outcomes: Student should be able to

1. Apply keyboard and mouse controllers, voice controllers and motion controllers.
2. Analyze the future changes in market.
3. Select the devices controls and displays for AR.
4. Create AR cards, dummy products, sketches, scenes, Stickers ,etc

References-

1. Virtual & Augmented Reality for dummies-Paul Mealy.
2. Dieter schmalzier, Tobias hollerer, “Augmented Reality”.
3. Steve aukstakalnis, “Practical Augmented reality”...
4. Alan B. Craig, “Understanding augmented reality: Concepts and applications”.

Course –BAST-604: (C) VR for Animation

Course Objectives: Student will be able to

1. Understand applications and overview of virtual reality
2. Understand difference between 6DOF and 360
3. Understand capturing movement process using different tools and techniques.
4. Study on Models rasterization and Latency.

Credits (Total Credits 2)	**SEMESTER-VI** BAST-604 **VR-For Animation**	**No. of hours per unit/credits**
UNIT - I	**Introduction of Virtual Reality**	**(11)**
	Defining Virtual Reality, History of VR, Human Physiology and Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, Interface to the Virtual World-Input & output-Visual, Aural & Haptic Displays, Applications of Virtual Reality.	
UNIT - II	**Representing the Virtual World**	**(11)**
	Representation of the Virtual World, Visual Representation in VR, Aural Representation in VR and Haptic Representation in VR	
UNIT - III	**The Geometry of Virtual Worlds &The Physiology of Human Vision**	**(12)**
	The Geometry of Virtual Worlds &The Physiology of Human Vision Geometric Models, Changing Position and Orientation, Axis-Angle Representations of Rotation, Viewing Transformations, Chaining the Transformations, Human Eye, eye movements & implications for VR.	
UNIT - IV	**Visual Perception & Rendering**	**(11)**
	Visual Perception - Perception of Depth, Perception of Motion, Perception of Color, Combining Sources of Information Visual Rendering -Ray Tracing and Shading Models, Rasterization, Correcting Optical Distortions, Improving Latency and Frame Rates.	

Course outcomes: Student should be able to

1. Understand VR systems work and list the applications of VR.
2. Understand the design and implementation of the hardware that enables VR systems to be built.
3. Create motion and tracking in VR systems.
4. Create interaction Video using Vuforia VR systems.

References-

1. Gerard Jounghyun Kim, *"Designing Virtual Systems: The Structured Approach"*, 2005.
2. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, *"3D User Interfaces, Theory and Practice"*, Addison Wesley, USA, 2005.
3. Oliver Bimber and Ramesh Raskar, *"Spatial Augmented Reality: Meging Real and Virtual Worlds"*, 2005.
4. Burdea, Grigore C and Philippe Coiffet, *"Virtual Reality Technology"*, Wiley Interscience, India, 2003.

Course – SECCAST – 607 Entrepreneurship Development

Course Objectives: Student will be able to

1. develop conceptual understanding of the topic among the students.
2. understand the environment of making of an entrepreneur.
3. analyse the various aspects, scope and challenges under an entrepreneurial venture.
4. understand business situations in which entrepreneurs act.

Credits (Total Credits 2)	**SEMESTER-VI** **SECCAST – 607 Entrepreneurship Development**	**No. of hours per unit/credits**
UNIT - I	**Entrepreneurship**	**(11)**
	Definition, requirements to be an entrepreneur, entrepreneur and entrepreneur, entrepreneur and manager, growth of entrepreneurship in India, women entrepreneurship, rural and urban entrepreneurship.	
UNIT - II	**Types of Enterprises and Ownership Structure**	**(11)**
	Small scale, medium scale and large-scale enterprises, role of small enterprises in economic development; proprietorship, partnership, Ltd. Companies and co-operatives: their formation, capital structure and source of finance	
UNIT - III	**Management of Enterprises**	**(12)**
	Objectives and functions of management, scientific management, general and strategic management; introduction to human resource management: planning, job analysis, training, recruitment and selection, etc.; marketing and organizational dimension of enterprises; enterprise financing : raising and managing capital, shares, debentures and bonds, cost of capital; break- even analysis, balance sheet its analysis.. **Institutional Support and Policies:** institutional support towards the development of entrepreneurship in India, technical consultancy organizations, government policies for small scale enterprises.	
UNIT - IV	**Projects**	**(11)**
	Identification and selection of projects; project report: contents and formulation, concept of project evaluation, methods of project evaluation: internal rate of return method and net present value method.	

Course outcomes: Student should be able to

1. develop conceptual understanding of the topic among the students.
2. understand the environment of making of an entrepreneur.
3. analyse the various aspects, scope and challenges under an entrepreneurial venture.
4. understand business situations in which entrepreneurs act

References-

1. Badhai, B 'Entrepreneurship for Engineers', Dhanpat Rai & co. (p) Ltd.
2. Desai, Vasant, ' Project Management and Entrepreneurship', Himalayan Publishing House, Mumbai, 2002.
3. Gupta and Srinivasan, 'Entrepreneurial Development', S Chand & Sons, New Delhi.
4. Ram Chandran, 'Entrepreneurial Development', Tata mcgraw Hill, New Delhi

ANIMATION SCIENCE LAB (BASP-608)

(BAST – 601 + BAST – 602)

(2D GAME DEVELOPMENT + MARKETING MANAGEMENT)

Course Objectives: Student will be able to

1. Understand types of game and game making platforms.
2. Understand mathematical logics.
3. Understand market strategy & planning.
4. Understand marketing operations.

Credits (Total Credit 04)	SEMESTER-VI ANIMATION SCIENCE LAB - (BASP-608) (BAST – 601 + BAST – 602) (2D GAME DEVELOPMENT + MARKETING MANAGEMENT)	No. of hours per unit/credits
Group-I	1. Button Event Handling - Create Play and Stop Buttons. 2. Dynamic & Input Text - Create two text box,type any letter in first text box and display it into second. 3. Math - Generate random number between 1 to 100 and display in text box. 4. Start Drag and Stop Drag Functions. 5. Create Two Buttons P, Q when the user click on P, display a square followed by circle. When the user click on Q, display a circle followed by square. 6. Create Log-in panel - 7. Create three buttons Red, Green, Blue and change the object colors using instance properties. 8. Buttons Navigation Bar – Home, Product, and Contact. Loading different images clicking the buttons. 9. Create Basic Dynamic Website in Flash 10. Create Basic Game in Flash.	4
Group-II	1. Study on concept, nature & importance of marketing. 2. Study on market strategy & planning. 3. Study on market segmentation & positioning. 4. Study on product & packaging. 5. Study on price factor & determinations. 6. Study on physical distributions & channels. 7. Study on personal selling & public relations. 8. Study on advertising. 9. Study on organisation & marketing operations. 10. Study on market research.	4

Course outcomes-Students should be able to

1. Create algorithm and programming for Flash game development
2. Create Log-in panel for Game
3. Create product packaging in flash and related software's.
4. create research level database for personal growth and programming.

References-

1. ADOBE flash CS6 User Manual. (anonymous)
2. Flash professional CS6-Katherine Ulrich. (anonymous)
3. Kotlar, Philip, Marketing Management, Prentice Hall, New Delhi.
4. Stanton, Etzel, Walker, Fundamentals of Marketing, Tata-McGraw Hill, New Delhi.

ANIMATION SCIENCE LAB (BASP-609)

(BAST – 603 + BAST – 604)

(Dynamics & Rendering + (A) 3D Printing in Animation/(B) AR for Animation/(C) VR for Animation)

Course Objectives: Student will be able to

1. Study on principles of dynamics.
2. Understand different techniques of 3D modeling.
3. Understand concepts of virtual reality and virtual environment.
4. to recognize and to use productively the basic tools of a 3d design application.

Credits (Total Credit 04)	**SEMESTER-VI** **ANIMATION SCIENCE LAB - (BASP-609)** **(BAST – 603 + BAST – 604)** **(Dynamics & Rendering + (A) 3D Printing in Animation/(B) AR for Animation/(C) VR for Animation)**	**No. of hours per unit/credits**
Group-I	1. Render settings with sun and sky. 2. Rendering paint effects (creating grass in Maya by paint effect, shadow effect). 3. Designing brushes (growing flowers, adding leaves). 4. Applying paint effects to Maya text curves (minimum 3 types). 5. Toon shading (Toon fills and toon outlines) with Character. 6. Creating glass with help of Arnold Renderer / Mental Ray in Maya (exterior scene). 7. Create dynamics-ncloth (flag). 8. Fooling around with nparticles. 9. Snow & Rain simulation with nparticles. 10. Adding Hair to a Character, Rendering Hair.	4
Group-II	**(A) 3D Printing in Animation** 1. How to draw in 3D using a 3D pen. 2. Create Text modelling 3. Create props for game design character. 4. Create a male body modelling. 5. Cartoon Character modelling. 6. Create semi cartoon modelling 7. Creating environmental background. 8. Create Aeroplane model. 9. Create Car modelling. 10. Create Lamp modelling. **(B) AR for Animation** 1. Create an AR holiday card in adobe aero. 2. Adding motion to objects using Adobe aero.	4

	3. Develop 2D animation in augmented reality using adobe aero. 4. Design an interactive and animated scene . 5. Create an AR dashboard in adobe aero. 6. Create an AR from a sketch in your sketch book using adobe aero. 7. Create an AR sticker. 8. Make an AR dummy product. 9. Make a 3D animated character for AR with Adobe Aero. 10. Create adobe aero Augmented Reality print flyer. **C -VR for Animation** 1. VR engines - UNITY Basics/ Google ARCore/ Vuforia, etc., 2. Develop Active 3D environments. 3. Health care application using VR. 4. Human behavior using VR. 5. VR exercise as a standalone treatment over traditional therapy. 6. VR with walking on treadmill. 7. Design a game in VR. 8. VR based teaching content. 9. VR model creation - Marker-based applications and Location-based application. 10. VR model for Motion Tracking, Environmental understanding, Light estimation.	

Course outcomes-Students should be able to

1. demonstrate nature element simulations in motion graphics and other CG production.
2. recognize and to use productively the basic tools of a 3d design application.
3. understand the AR development techniques.
4. describe interaction in VR devices.

References-

1. Designing for Mixed Reality, Kharis O'Connell Published by O'Reilly Media, Inc., 2016.
2. Sanni Siltanen- Theory and applications of marker-based augmented reality. Julkaisija – Utgivare Publisher. 2012.
3. Allan Fowler-VR Game Development‖, 1st Edition, A press Publications, 2018.
4. Tony Parisi – Learning Virtual Reality, O'Reilly Media, Inc., 2015

ANIMATION SCIENCE LAB (BASP-610)

Entrepreneurship Management

Course Objectives: Student will be able to

1. develop conceptual understanding of the topic among the students.
2. understand the environment of making of an entrepreneur.
3. analyse the various aspects, scope and challenges under an entrepreneurial venture.
4. understand business situations in which entrepreneurs act.

Credits (Total Credit 04)	**SEMESTER-VI** **ANIMATION SCIENCE LAB - (BASP-610)** **Entrepreneurship Management**	**No. of hours per unit/credits**
Group-I	1. Search a successful entrepreneur and study his case and make presentation (Team work is expected). 2. Strategy making for solving business problem. 3. Collection of different documents needed in business and study the same. 4. Creation of Advertisements in animation and publish. 5. Basic financial calculation like film making video editing, website creation etc. 6. Illustrate the steps to start the business. 7. Elaborate the various components affects the business growth. 8. case study	4

Course outcomes-Students should be able to

1. develop conceptual understanding of the topic among the students.
2. understand the environment of making of an entrepreneur.
3. analyse the various aspects, scope and challenges under an entrepreneurial venture.
4. understand business situations in which entrepreneurs act

References-

1. Badhai, B 'Entrepreneurship for Engineers', Dhanpat Rai & co. (p) Ltd.
2. Desai, Vasant, ' Project Management and Entrepreneurship', Himalayan Publishing House, Mumbai, 2002.
3. Gupta and Srinivasan, 'Entrepreneurial Development', S Chand & Sons, New Delhi.
4. Ram Chandran, 'Entrepreneurial Development', Tata mcgraw Hill, New Delhi

ANIMATION SCIENCE LAB (BASP-611)

Project Lab

Sem VI (50Marks)

Project Marks Distribution (Total 50 Marks)

05 - Project Viva

05 - Project Design

10 - for industrial training in vacation, 10 days after completion of Semester V **(Registered organization industrial training certificate required)**

10 - Project Report

10- Case Study/Educational Tour/Seminar/Training/ Scientific Writing

10- Day to day Performance

Note: - Project should be based on Classical Animation, 2D Animation / 3D Animation/ game development / AR App development (Unity)

Standard Project Report Documentation Format

1. Cover Page
2. Institute/College Recommendation
3. Guide Certificate
4. Declaration
5. Acknowledgement
6. Index
7. Chapters with page Numbers
    1) Introduction of Project
    2) Script
    3) Storyboard
    4) Layout and Animatics
    5) Characters Family
    6) Backgrounds
    7) Characters Model sheet
    8) Voice and Music
    9) Staging Scenes
    10)Animation
    11) Output
    12) Conclusion
    13) Future Plan
    14) Bibliography