

**JSS MAHAVIDYAPEETHA**



ESTD-1964

**JSS COLLEGE OF ARTS, COMMERCE & SCIENCE**

(An Autonomous College of University of Mysore)

Re-accredited by NAAC with 'A' grade

OOTY ROAD, MYSORE-570 025, KARNATAKA

# Syllabus

**Advanced Diploma in Animation(CC)**

**2018-19**

**COMPUTER SCIENCE DEPARTMENT (UG)**

**Animation and Multimedia(CC)**  
**Certificate – Level 4- Character Designer**  
(National Competency Certificate)

**Semester 1**  
**Vocational Content**

**MES / N 0501 - Understanding the script**

Section – A

Pre-Production Techniques: Ideas, Themes, Concepts, Story Development. Script- Format, Storyboard. Short Film, Documentary, Feature Film. Script Terms, Understanding Genre, Different Types of Genres and Sub Genres, Read-through and Identifying

Character types. Understanding Narration Style, Time, Place and society condition status of the Character. Plot Interpretation. Three act Structure.

Introduction on how to make drawings for animation, Shapes and forms, About 2d and drawings, Clay modeling, Layout design according to a storyboard. Human anatomy, skeleton structure, animal anatomy and mythical creatures. Studying Human and animal movement through sequential drawings, gesture drawing, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

Section – B

1. Story Reading (Read-through)
2. Group Discussion
3. Observation of Character development.
4. Acting (Read-through)

**MES / N 0502 - Ensuring consistency across all scenes**

Section – A

Introduction to Pencil Drawing- Introduction to basic drawing techniques including proportions and Line, Using Pencils for shading, People and Animals, Proportion in portrait drawing, Highlighting and shadows, Drawings with the help of basic shapes, understanding of the relationship of bones and muscles at rest and in movement to able to translate and maintaining correct volumes.

Introduction to Perspectives: Perspective in 1 point, Perspective in 2 point, Perspective in 3 point, Eye levels, Vanishing point, Significance of Perspective in animation and composition, Humans and animal forms in perspective, Perspective-blocks, boxes and shapes, Scale diagrams in perspective, Different viewpoints, Importance of eye level.

## Section – B

1. Drawing Basic shapes
2. Shapes in to forms
3. One-point Perspective - Table
4. Two-points Perspective - Exterior
5. Three-points perspective – Interior
6. Drawing simple characters using simple shapes
7. Drawing cartoons
8. Drawing male characters (6&7 Heads)
9. Drawing Female Characters (4&5 Heads)
10. Drawing an animal Character
11. Drawing a Hybrid Character (Fantasy)

## **MES / N 0503 - Design Characters**

### Section – A

Introduction on how to make drawings for animation, Shapes and forms, About 2d and drawings, Clay modeling, Layout design according to a storyboard. Human anatomy, skeleton structure, animal anatomy and mythical creatures.

Studying Human and animal movement through sequential drawings, gesture drawing, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

Intro to Raster: Foreground & background, Changing Foreground and Background colors, using the large color selection Boxes and small color swathes, using the Eyedropper tool to sample Image color, changing the Foreground Color While using a Painting Tool. Using Brushes, Selecting the Brush Shape, drawing a vertical and Horizontal Straight lines with any brush, Drawing connecting Straight Lines (at any angle) with any brush, creating a New Brush, Saving Brushes, Loading Brushes, creating a Custom Brushes, Using the Painting Modes, Fade, Airbrush Options, Pencil Options.

Intro to Vector: Understanding paths, views, selection tools, fills and strokes, setting up preferences and color settings, Creating basic geometric shapes with the Shape tools, Using a grid and smart guides to aid symmetrical drawing, Using the Bezier Pen, Direct Selection tool, and Convert tool efficiently, Applying and editing color gradients to filled regions, Creating and using swatches, tints, gradients, and patterns on filled regions.

3D MODELING: Introduction to various 3D modeling Techniques: - Organic Modeling, Mechanical & Technical Modeling. Using Templates for Modeling. Polygon and Patch. Concept of edit meshes and edit poly. Low poly modeling. Modifiers and compound objects. How to manage vertex, faces and polygon selections.

Introduction to, curves, create a curve from a surface edge, isoparm, or curve-on-surface and Bezier curve editing curves, Surface tools, Trimming, Stitching. Sculpting NURBS surfaces, NURBS Modeling Reference, import vector data as curves or generate polygonal surfaces.

#### Section – B(1)

1. Perspective art.
2. Traditional designs.
3. 2D Character Designing
4. Photo Collage
5. Matt Painting
6. Digital painting
7. 2d Animation basics
8. Gif Animation.

#### Section – B(2)

1. Modeling an Apple.
2. Modeling a simple Robot Character.
3. Modeling a Human Face.
4. Modeling Human Body.
5. Modeling Prop for Character (Costume).
6. Modeling an animal character.
7. Modeling a Fantasy Character.

### **MES / N 0513 - Manage and store assets**

#### Section – A

Understanding Management, SOP, research appropriate tools, techniques, technologies and procedures for effective asset storage, Saving the work with appropriate names and/or naming conventions so that it can be identified easily. Storing the work in an appropriate place using appropriate storage techniques to ensure it is protected from damage.

Making backup copies at appropriate time intervals of any digital files. Routinely archive any work and store it securely in a second location, if required. Identify and retrieve previous work from storage, as required.

#### Section – B

1. Arranging Materials in order
2. Writing Logs
3. Group discussion on Assets Allocation.
4. Assets handling and Proper storage Techniques
5. Data storage techniques.

## **MES / N 0104 - Maintain workplace health and safety**

### Section – A

Understand and comply with the organization's current health, safety and security policies and procedures

Understand the safe working practices pertaining to own occupation. Understand the government norms and policies relating to health and safety including emergency procedures for illness, accidents, fires or others which may involve evacuation of the premises. Participate in organization health and safety knowledge sessions and drills

### Section – B

1. Identify the people responsible for health and safety in the workplace, including those to contact in case of an emergency.
2. Identify security signals e.g. fire alarms and places such as staircases, fire warden stations, first aid and medical rooms.
3. Identify aspects of your workplace that could cause potential risk to own and others health and safety.
4. Ensure own personal health and safety, and that of others in the workplace through precautionary measures.
5. Identify and recommend opportunities for improving health, safety, and security to the designated person.
6. Report any hazards outside the individual's authority to the relevant person in line with organizational procedures and warn other people who may be affected.
7. Follow organization's emergency procedures for accidents, fires or any other natural calamity in case of a hazard.
8. Identify and correct risks like illness, accidents, fires or any other natural calamity safely and within the limits of individual's authority.

# Semester 1 General Content

## L4 – Sem 1 - GC - Communication Language Kannada

### ಸಾಹಿತ್ಯ ಘಟಕ

12 ಗಂಟೆಗಳು

1. ಕಾವ್ಯ
1. ಯಾವ ಕಾಲದ ಶಾಸ್ತ್ರವೇನು ಹೇಳಿದರೇನು? - ಕುವೆಂಪು
2. ಪುಟ್ಟ ವಿಧವೆ - ಬೇಂದ್ರೆ
3. ರಂಗೋಲಿ - ಪುತಿನ
4. ಮುಂಬೈ ಜಾತಕ - ಜಿಎಸ್‌ಎಸ್
5. ಅಡುಗೆ ಮನೆಯ ಹುಡುಗಿ - ವೈದೇಹಿ
6. ನನ್ನ ಜನಗಳು - ಸಿದ್ದಲಿಂಗಯ್ಯ

### 2. ಗದ್ಯ

12 ಗಂಟೆಗಳು

1. ನಿರಂತರ ನೀರಿಗಾಗಿ ನಿಂತಲ್ಲೇ ಓಟ - ನಾಗೇಶ್ ಹೆಗಡೆ
2. ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ : ಒಂದು ಸ್ಥೂಲ ನೋಟ - ಜಿ.ಎನ್. ನರಸಿಂಹಮೂರ್ತಿ
3. ಮೂಢನಂಬಿಕೆಗಳ ಬೀಡಿನಲ್ಲಿ - ಭುವನೇಶ್ವರಿ ಹೆಗಡೆ
4. ಬೇಡದ ಅತಿಥಿಗಳು - ಎ ಎನ್ ಮೂರ್ತಿರಾಯರು

### ಭಾಷಾ ಘಟಕ

#### 3. ಆಡಳಿತ ಮತ್ತು ವಾಣಿಜ್ಯ ಕನ್ನಡ

21 ಗಂಟೆಗಳು

1. ಆಡಳಿತ ಭಾಷೆಯಾಗಿ ಕನ್ನಡ ಸ್ವರೂಪ ಮತ್ತು ಲಕ್ಷಣ
2. ಸರ್ಕಾರಿ ಪತ್ರ ಸ್ವರೂಪ ಅಧಿಕೃತ ಜ್ಞಾಪನ ಮತ್ತು ಸುತ್ತೋಲೆ
3. ವಿವಿಧ ರೀತಿಯ ಅರ್ಜಿಗಳು - ರಜೆ, ವೇತನ, ಬಡ್ಡಿ, ಪದೋನ್ನತಿ ಇತರೆ
4. ವಾಣಿಜ್ಯ ಕನ್ನಡದ ಸ್ವರೂಪ ಮತ್ತು ಲಕ್ಷಣ
5. ವಾಣಿಜ್ಯ ಪತ್ರದ ವಿವಿಧ ಅಂಗಗಳು ವಾಣಿಜ್ಯ ಪತ್ರಗಳು- ವಿಚಾರಣಾ ಪತ್ರ, ಆದೇಶ ಪತ್ರ, ಉದರಿಪತ್ರ, ವಸೂಲಿ ಪತ್ರ, ಪರಿಚಯ ಪತ್ರ, ಪರಾಮರ್ಶನ ಪತ್ರ, ವ್ಯವಹಾರೋದ್ದೇಶನ ಪತ್ರ, ಪರಿಪತ್ರ
6. ಗಣಕದಲ್ಲಿ ಕನ್ನಡ ಕನ್ನಡದ ಅಂತರ್ಜಾಲ ತಾಣಗಳು- ನುಡಿ, ಬರಹ- ಪಾರಿಭಾಷಿಕ ಪದಗಳು
7. ಭಾಷಾಂತರ : ಸ್ವರೂಪ ಮತ್ತು ಲಕ್ಷಣ- ಕನ್ನಡದಿಂದ ಇಂಗ್ಲಿಷಿಗೆ- ಇಂಗ್ಲಿಷಿನಿಂದ ಕನ್ನಡಕ್ಕೆ

### ಪರಾಮರ್ಶನ ಗ್ರಂಥಗಳು

1. ಸಮಗ್ರಕಾವ್ಯ - ಜಿ ಎಸ್ ಶಿವರುದ್ರಪ್ಪ
2. ಬಿಂದು ಬಿಂದಿಗೆ - ವೈದೇಹಿ
3. ಪಕ್ಷಿಕಾಶಿ - ಕುವೆಂಪು
4. ಸಮಗ್ರಕಾವ್ಯ - ಬೇಂದ್ರೆ
5. ಶತ್ರುವಿಲ್ಲದ ಸಮರ - ನಾಗೇಶ್‌ಹೆಗ್ಡೆ
6. ವ್ಯಾವಹಾರಿಕ ಕನ್ನಡ - ಎಚ್ ಎಸ್ ಕೆ
7. ಆಡಳಿತಕನ್ನಡ - ಡಾ ಅಶೋಕ್‌ಕುಮಾರ್ ರಂಜೇರ ಮತ್ತು ಇತರರು
8. ಕಛೇರಿ ಕೈಪಿಡಿ - ಕುವೆಂಪು ಕನ್ನಡ ಅಧ್ಯಯನ ಸಂಸ್ಥೆ
9. ಲೇಖನಕಲೆ - ಎಸ್ ಪ್ರಹ್ಲಾದರಾವ್
10. ಆಡಳಿತಭಾಷೆ ಕೆಲವು ವಿವರಗಳು - ಪ್ರಧಾನ ಗುರುದತ್ತ

#### **L4 – Sem 1 - GC - Mathematics:**

Unit 1: Algebra

Quadratic and cubic equations – Progressions – Vectors-Scalar product- vector product – vector triple product – standard results and simple problems.

Unit 2: Analytical Geometry

Cartesian coordinate system – Distance formula – section formula – Equation of lines. simple problems – circles – parabola-ellipse-hyperbola-simple problems.

Unit 3: Trigonometry and Calculus

Trigonometric ratios- inverse trigonometric functions – simple problems .

Limits – Rules of differentiation – simple problems.

#### **L4 – Sem 1 - GC – Physics:**

PHYSICAL WORLD

Physics: Scope and excitement of physics - Physics, technology and society - Mention of fundamental forces in nature - Nature of physical laws.

UNITS AND MEASUREMENTS

Unit of measurement - System of units - SI units - Fundamental and derived units - Length, mass and time measurements - Accuracy and precision of measuring instruments, Errors in measurement. Significant figures, Numerical problems.

SCALAR AND VECTORS

Scalars and Vectors – Position and displacement vectors - Equality of vectors - Multiplication of a vector by real number, Addition and subtraction of two vectors, Triangle method and parallelogram method.

List of Experiments:

- 1) To measure diameter of a small spherical body using Vernier Calipers.
- 2) To measure diameter of a small cylindrical body using Vernier Calipers.
- 3) To measure internal diameter and depth of a given beaker using Vernier Calipers and hence find its volume.
- 4) To measure internal diameter and depth of a given calorimeter using Vernier Calipers and hence find its volume.
- 5) To measure diameter of a given wire using screw gauge.
- 6) To measure thickness of a given sheet using screw gauge.
- 7) To measure volume of an irregular lamina using screw gauge.
- 8) To determine the masses of two different objects using a beam balance.

## **L4 – Sem 1 – GC - Computer science:**

### **L4-Sem-1-GC: COMPUTER SCIENCE – I**

#### Computer Fundamentals

##### Unit 1:

Knowing computer: What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Applications of ICT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply. Operating Computer using GUI Based Operating System: What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Short cuts, Basics of O.S Setup; Common utilities.

##### Unit 2:

#### Programming Development life cycle

Understanding Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

Using Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.

Introduction to Internet, WWW and Web Browsers: Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Knowing the Internet; Basics of internet connectivity related troubleshooting, World Wide Web; Web Browsing software's, Search Engines; Understanding URL; Domain name; IP Address; Using e-governance website.

Communications and collaboration: Basics of electronic mail; Getting an email account; Sending and receiving emails; Accessing sent emails; Using Emails; Document collaboration; Instant Messaging; Netiquettes.

Small Presentation Making: Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.

#### Reference Books:

Computer today by Donald H. Sanders - McGraw-Hill, 1983



**Semester 2**  
**Certificate – Level 5- Script Researcher**  
(National Competency Certificate)

**Vocational Content**

**MES / N 3001 - Understand and detail the concept**

Section – A

What Is a Short Story? Finding a Story to Write, A Short Story's Basic Ingredients, Sitting Down to Write.

Choosing a Protagonist, choosing a Point of View, Bringing Your Characters to Life, Tip Sheet: Three-Dimensional Characters, Character's Bio Chart, Giving Your Characters a Voice, Tip Sheet: Dialogue

How Conflict Works in a Short Story, The Protagonist's Predicament, Bad Guys, Hurricanes, and Fatal Flaws, Conflict Equals Suspense.

Scriptwriting terminology: Action, Angle, BG close up, Exterior, fade in fade out, Pan, Parenthetical, POV, Scene Heading, Slug line, SFX, Sotto voce, track with, Voice over, Character name, Cast List, Dialogue, Script Length, Action Description, Extension, Dual-Column Dialogue, Act numbers, Scene Numbers, short lines, dialogue paragraphs, Character Arc.

Section - B

1. Exercises: Generating Ideas.
2. Exercises: Creating Characters.
3. Exercises: Finding Story Conflict.
4. Exercises: Constructing a Plot.
5. Exercises: Making a Setting Vivid.
6. Exercises: Discovering and Developing Your Voice.
7. Public domain material, Protecting the idea, Proof of ownership, Confidentiality agreement, Piracy, Animation Industry in India, Case Study.

**MES / N 3002 - Undertake research for scripts**

Section - A

Creating Your Own Show, Writing a TV Proposal, Drama and Comedy, Documentary and Reality, Formatting and Presentation, One hour Drama, Procedural, Serialized, Half-hour Comedy or Sitcom, Single-Camera Format, Multi-Camera Format, Limited Series or Miniseries.

Scriptwriting for both short film: Dialogue, Parenthetical, Extension, Shot Transition, Dual-Column Dialogue, Act numbers, Scene Numbers, Cast List, short lines, dialogue paragraphs, Script Styles & Types, Script Length Scene Heading Action Description , Character Name, Dialogue, Parenthetical, Extension, Transition, Shots.

Section - B

1. Do a Research.
2. Understanding the impact on the society.
3. Finding the common interest.
4. Creating the effective narration format.

## **MES / N 3005 - Assist in drafting scripts**

### Section – A

Scriptwriting for feature film: Dialogue split by Action, Emphasis in Action, Abbreviations, Short Lines, Dialogue Paragraphs, Montage & Series of Shots, Supers - Titles, Signs, etc, Phone Calls and Intercuts Two people talking at the same time.

Introduction to storyboard: Introduction, Multimedia Storyboarding Tools, The Advantages of Storyboarding, Interactive Storyboarding, Using Interactive Storyboarding to Speed-up the Content-writing Phase, Using Interactive Storyboarding to Speed-up Report Document Production.

Steps of storyboard writing: Storyboard table, Topic, Timeline, Sketches, color scheme, text attributes, Audio, camera angle, Interaction of buttons and text.

### Section - B

Understanding Camera terms: Extreme Lon Shot, Long Shot, Mid Shot, Close-up, Extreme Close-up, Over the shoulder. Panning, Tilt, Dolly shot, Crane Shot, Moving Shot.

## **MES / N 0104 - Maintain workplace health and safety**

### Section – A

Understand and comply with the organization's current health, safety and security policies and procedures

Understand the safe working practices pertaining to own occupation. Understand the government norms and policies relating to health and safety including emergency procedures for illness, accidents, fires or others which may involve evacuation of the premises. Participate in organization health and safety knowledge sessions and drills

### Section – B

1. Identify the people responsible for health and safety in the workplace, including those to contact in case of an emergency.

2. Identify security signals e.g. fire alarms and places such as staircases, fire warden stations, first aid and medical rooms.

3. Identify aspects of your workplace that could cause potential risk to own and others health and safety.

4. Ensure own personal health and safety, and that of others in the workplace through precautionary measures.

5. Identify and recommend opportunities for improving health, safety, and security to the designated person.

6. Report any hazards outside the individual's authority to the relevant person in line with organizational procedures and warn other people who may be affected.

7. Follow organization's emergency procedures for accidents, fires or any other natural calamity in case of a hazard.

8. Identify and correct risks like illness, accidents, fires or any other natural calamity safely and within the limits of individual's authority.

## Semester 2 General Content

### L5 – Sem 2 - GC - Communication English:

**AIMS:** 1) To familiarize students with basic English  
2) To enable them to develop listening & speaking skills

**OBJECTIVES:** Students should be able to \_\_\_\_

- 1) Write English without grammatical errors
- 2) Speak English Language Effectively and Accurately
- 3) Listen and understand public announcements and news on TV & Radio

### **Module – 1 Grammar**

1. Subject and Verb Agreement
2. Voice
3. Articles
4. Speech
5. Question tag
6. Framing of Questions

### **Module – 2 Writing Skills**

1. Letter Writing  
Letter of Application/Letter of Grievances/Resume Preparation
2. Comprehension
3. Essay Writing

### **Module – 3 Speaking Skills**

1. Greeting
2. Requesting
3. Enquiring
4. Explaining
5. Reporting
6. Permission
7. Thanking

## **L5 – Sem 2 - GC - Mathematics:**

Section – A

Unit 1: Algebra

Sets –Relation - functions- Mathematical logic and Graph theory, Matrices and determinants –invertible matrices (only 2x2 matrices) - Characteristic equations and Eigen values (only 2x2 matrices).

Unit 2: Quadric Surfaces

Sphere - Ellipse –Cone-Ellipsoid-Paraboloid-Hyperboloid of one and two sheets – Intersection of Quadric surface and plane – Tetrahedron.

Unit 3: Integration and differential equations

Indefinite and definite integrals –simple problems – Differential equations of first order – separation of variables.

## **L5 – Sem 2 - GC - Physics:**

Section – A

**THERMODYNAMICS:**

Definition of temperature, heat, change of state, green-house effect, first law of thermodynamics, thermal equilibrium, classification of thermodynamic system, zeroth law of thermodynamics, internal energy, work, isothermal process, adiabatic process, isochoric, Isobaric Process, Second law of thermodynamics, reversible and irreversible process.

**MOTION IN A STRAIGHT LINE:**

Rest, motion, Position and frame of reference - Definitions of path length and displacement - Definitions of average speed and average velocity, instantaneous speed and instantaneous velocity & uniform and non-uniform motion – Uniformly accelerated motion.

Section – B

**List of Experiments:**

- 1) Using a simple pendulum, plot L-T and L-T<sup>2</sup> graphs, hence find the effective length of second's pendulum using appropriate graph.
- 2) To find the weight of a given body using parallelogram law of vectors.
- 3) To determine the coefficient of viscosity of a given liquid by measuring the terminal velocity of a spherical body by stoke's method.
- 4) To determine Surface tension of Water by capillary rise method.
- 5) Interfacial between Water and Kerosene.
- 6) Verification of Lami's theorem.
- 7) Verification of Gaussian distribution and calculation of standard deviation in a Monte Carlo experiment.
- 8) Determination of the moment of inertia of an irregular body using Torsional pendulum.

## **L5 – Sem 2 - GC - Computer Science:**

### Section - A

1. Concepts of object oriented programming: object class. Encapsulation data hiding Inheritance. Polymorphism. Analysis and design of system using Object Oriented Approach.
2. Structure of a C++Program: Include files, Declaration of an object, Main function, I/O streams.
3. Classes: Class Declaration: Data Members, Member Functions, Private and Public members. Data hiding and encapsulation, arrays within a class. Class function Defection, scope resolution operator, Private and Public member function, Nesting of member functions.
4. Objects: Creating Objects, accessing class data members, Accessing member functions. Arrays of Objects, Objects as function arguments: Pass by value by Reference, Pointers, to Objects.

### Section - B

5. Constructors and Destructors: Constructors: Declaration and Definition, Default Constructors, Parameterized Constructors, Copy Constructors. Destructors: Definition and use.

### Section - C

6. Function Overloading: Function Overloading: Declaration and definition.
7. Inheritance – Extending Classes: Concept of inheritance, base, derived class, defining derived, classes, visibility modes, private, public, protected; sinle inheritance: private and protected members by member functions of a derived class, multilevel inheritance, nesting of classes.

### **Reference Books:**

Object Oriented Programming with C++ By Balagurusamy- McGraw-Hill,  
Object Oriented Programming And C++ By R. Rajaram  
PRACTICAL: Practical's based OBJECT ORIENTED PROGRAMING (USING C++)  
Objective

**Semester 3**  
**Certificate – Level 6 – Animation Director(A)**  
(National Competency Certificate)

**Vocational Content**

**MES / N 1304 - Communicate requirements to the team**

Section - A

Introduction to Communication, Verbal Communication, Face to Face communication, Tone of Voice, Body Language, Physical Communication.

Introduction to Listening Skills, Self-Awareness, Active Listening, Listening in Difficult Situations, Shades of Meaning. Formal Communication, and Informal communication.

Effective Communication: Voice with Emotions, Speaking what you thinking, Having a group discussions, Making Teams and Dividing responsibility.

Section – B

1. Writing Letter

- a. Writing a letter for Long leave
- b. Writing a letter for Pramotion

2. Improvising the Content

- a. Adding an emotional touch to your letter.
- b. Correcting the meaning.

3. Group Discussion and Games for Communication.

- a. Wordless Acting
- b. Famous Pair
- c. Listen, Interpret, Draw
- d. Role-playing and Conflict Resolution
- e. y-o-u-r-n-a-m-e

4. Communication Through Activities.

- a. Listening with Intention
- b. Record/Watch yourself talk
- c. DPR on Given Content.

## **MES / N 1306 - Direct the animation process**

### Section – A

**Basic Principles in animation:** Squash and stretch, Anticipation, Staging, straight ahead and pose to pose, follow through and overlapping action, Slow in and slow out, Arcs, Secondary action, Timing, Exaggeration, Solid drawing, Appeal, Mass and weight, Character acting, Volume, Line of action, Path of action, Walk cycles- animal and human.

**Introduction to Sculpting software interface:** Mesh Manipulation, Using different, applying strokes, Projection mapping, Dynamic topology, Adding detail to poly mesh, Using symmetry tool, Exporting the mesh.

**Introduction to basic material types & procedurals:** Study of concepts:- opacity, smoothness, specularity and color. Drawing 2D art templates, Creating complex effects like water fire and smoke. Unwrapping the map for various 3D characters.

**Introduction to the mapping and advanced texturing techniques.** Shadow maps, Raytraced shadows & radiosity. Concept of lighting system and shadows. Introduction to 3 point, 2 point and dramatic lighting. Creating photo real environments and textures. Applying on to a 3D objects. Understanding how to produce final output, rendering the scene, rendering the effects, network rendering.

**Introduction to advance lighting effects:** Mental ray rendering and Toon shade rendering. Creating various outputs as per the end user requirements and maintaining the resolution.

**Introduction to Character setup:** Riggers role, Criteria for a good rig, Joints and skeletons, Creating skeleton hierarchy, Constraints, Forward(FK) and Inverse kinematics(IK), FK, IK joint structures, Animation controllers, Blend shapes, Clusters, Biped Rig- Analyzing reference, Anatomy of human body, Bone placements, Setting up Torso, Biped Arms, Fingers, Legs/Foot controls, Skinning, Facial Rig- Anatomy of a face, The Facial Action Coding System(FACS), Mouth shapes, Phonemes, Animation controllers for Face, Character GUI.

**Introduction to Fur, Procedural textures:** Inclination, roll and polar, Fur volume and Noise, Painting fur attributes, modifying fur direction, Modifying color of a fur descriptions, Creating nCloth collision, Constraints, Hair System: Artisan, Hair system components, Modify curve tools, Paintfx with hair, Hair collision, Hair system caching, Hairstyles.

**Muscle systems Introduction to 3D Muscle system:** Components of Muscle, Capsules, Spline based muscle system, Stretch based muscle systems, Muscle Objects and skins, Assigning weights to Muscle skin, Muscle Builder, Muscle Parameters, Custom muscle systems, Wrinkles, fold, jiggle, Slide, Collide, Muscle control.

### Section – B(1)

1. Exercises: Ball Bounce (Heavy & Light).
2. Exercises: pendulum.
3. Exercises: Walk Cycle.
4. Exercises: Run.
5. Exercises: Vanilla Walk.
6. Exercises: Animal Walk Cycle.

#### Section – B(2)

1. Exercises: Human Nose sculpt.
2. Exercises: Human Eyes Sculpt.
3. Exercises: Human Mouth Sculpt.
4. Exercises: Human Ears Sculpt.
5. Exercises: Human Character planning.
6. Exercises: Human Character body sculpting.
7. Exercises: Human Character Face sculpting.

#### Section – B(3)

1. Exercises: Shading networks.
2. Exercises: Tire Texturing.
3. Exercises: Rusty Automotive Texturing.
4. Exercises: Human Skin Texturing.
5. Exercises: Animal Skin Texturing.
6. Exercises: 2 Point lighting.
7. Exercises: 3 Point lighting.
8. Exercises: Interior lighting (Lamps, Bulbs).

#### Section – B(4)

1. Exercises: Rigging with Deformers.
2. Exercises: Rigging simple vehicle.
3. Exercises: Rigging cartoon character-Legs.
4. Exercises: Rigging cartoon character- Arms.
5. Exercises: Rigging cartoon character- Face rigging.
6. Exercises: Face expressions using Blend shapes.

#### Section – B(5)

1. Exercises: Creating fur.
2. Exercises: Creating Hair.
3. Exercises: Simulating Sparks.
4. Exercises: Jiggle animation.
5. Exercises: Adding Muscle System to a human Arm.
6. Exercises: Muscle Weight Paint.



## Semester 3 General Content

### L6-Sem 3 – GC – Physics:

#### LAWS OF MOTION

Newton's first law of motion: Concept of inertia and force – Concept of momentum - Newton's second law of motion - Impulse, impulsive force and examples - Newton's third law of motion: Identification of action and reaction pairs with examples in everyday life.

Collisions: Elastic and inelastic collisions

#### SYSTEMS OF PARTICLES AND ROTATIONAL MOTION

Definitions of a rigid body, translator motion and rotatory motion - Centre of mass of a two-particle system - Mention of expression for position coordinates of centre of mass of (a) n particle system (b) a rigid body and (c) a uniform thin rod.

#### Section – B

#### List of Experiments:

- 1) To study the relation between force of limiting friction and normal reaction and to find the coefficient of friction between surface of a moving block and horizontal surface.
- 2) To find the downward force, along an inclined plane, acting on a roller due to gravity and study its relationship with the angle of Inclination by plotting graph between force and  $\sin\theta$
- 3) Determination of the Moment of inertia of rectangular lamina by using torsional pendulum.
- 4) Determination of the Moment of inertia of circular lamina by using torsional pendulum.
- 5) Determination of the acceleration due to gravity and the radius of gyration by using Bar pendulum(Graphical method)
- 6) Determination of the Moment of inertia of irregular body by using torsional pendulum.
- 7) To find the force constant and effective mass of a helical spring by plotting  $T^2 - m$  graph using the method of oscillation.
- 8) To study the relationship between the temperature of a hot body and time by plotting a cooling curve.

## **L6-Sem 3 – GC – Electronics:**

### **Unit 1: Introduction to Electronics**

AC and DC sources.

Ohm's law – statement and limitations, numerical as applicable. Definition of power and unit. Kirchhoff's laws- statement and explanation, numerical.

Passive components

Resistors – types, fixed resistors – definition and example. Colour code. Variable resistors – definition and example. Combination of resistors in series and parallel (no derivation) numerical.

Capacitors- Types – fixed Capacitors – definition and example, Variable Capacitors – definition and example. Equivalent of capacitors in series and parallel combination (no derivation) numerical.

Inductors – types – fixed inductor - definition and example. Equivalent of inductors in series and parallel combination (no derivation) numerical.

(15 hrs)

### **Unit 2: Semiconductor devices**

Classification of solids, Introduction to semiconductors – Intrinsic and extrinsic Semiconductors, PN Junction diodes - characteristics.

Mention of Zener diode, tunnel diode, photo diode and LED and their applications.

(15 hrs)

## **L6-Sem 3 – GC – Computer Science:**

Section – A

Unit 1: Python: Introduction, features, First Step with Python, Interactive Mode, Script Mode, Variables and Types, Mutable and Immutable Variables, Keywords, Operators and Operands, Expression and Statements, Input and Output, Comments.

Functions: Introduction, Module, Built in Function, Composition, User Defined Functions, Parameters and Arguments, Scope of Variables, ways of defining Functions.

Conditional and Looping Construct: Control Flow Structure, Looping Constructs.

Strings: introduction, Creating and initializing strings, Strings are immutable, Traversing a string, Strings Operations & string Slicing, String methods & built in functions, Regular expressions and Pattern matching

Section - B

Unit 2:

Lists: Introduction, creating a list, accessing an element of list, traversing a List, Appending in the list, Updating array elements, Deleting Elements, Other functions & methods, List as arguments, Matrix implementation using list, Functions with list, Function call.

Dictionaries: What is dictionary? Key-value pair, Creation, initializing and accessing the elements in a Dictionary, Traversing a dictionary, Creating, initializing values during run time (Dynamic allocation), Appending values to the dictionary, Merging dictionaries: An update, Removing an item from dictionary, Dictionary functions and methods.

Tuples: What is a Tuple? Tuple Creation, Add new element to Tuple, Tuple Assignment, Tuple Slices, Tuple Functions

Reference Books:

Beginning Programming with Python for Dummies by stef Maruch & Aahz Maruch.

### **L6-Sem 3 – GC – Indian Constitution:**

#### **UNIT I**

Preamble of the Indian Constitution

- a) Salient features of Indian Constitution

#### **UNIT II**

- a) Fundamental Rights
- b) Fundamental Duties
- c) Directive principles of State Policy

#### **UNIT III**

- a) President – Election Method, Powers and Functions
- b) The Role of the Prime Minister
- c) The Parliament – Structure, Power and Functions(Lok Sabha and Rajya Sabha)
- d) Supreme Court – Organization and Jurisdiction

#### **UNIT IV**

- a) The Role of Governor in the Administration of State
- b) Powers and Functions of the Chief Minister
- c) Composition, Powers and Functions of both the Houses of State Legislature
- d) High Court – Organization and Jurisdiction

**Semester 4**  
**Certificate – Level 6 – Animation Director (B)**  
(National Competency Certificate)

**Vocational Content**

**MES / N 1307 - Direct the post-production process**

**Advanced Dynamics and pyrotechnics:** Introduction to Dynamics, and Dynamic solver, Particles, Emitters, Fields: Air, Drag, Gravity, Newton, Turbulence, Vortex, Volume, Particle collisions, Particle cache, Goals, Soft bodies, Springs, Rigid bodies, Constraints, Effect: Fire, Smoke, Fireworks, Lightning, Shatter, Curve flow, Surface flow, Rendering particles and effects, Maya Paint Effects, baking simulations, Render types. UNIT – 2 Fluid Effects Introduction to Fluids, Fluid field interaction, Fluid attributes, , Creating a non-dynamic 3d fluid effects, Creating dynamic 3D effect, Creating fire and smoke using Fluid dynamics, creating an ocean.

**Introduction to nParticles and Nucleus solver,** Nucleus node, Nucleus forces, Nucleus plane, Nucleus attributes, nParticles interaction, nConstraints, nCloth: simulations, nCloth dynamics properties, Working with nConstraints, Tearing cloth, Dynamic Property maps, Simulating cloth on moving character, nParticle caching, nConstraints, Creating Smoke simulations in nParticles, Creating liquid simulations in nParticles, Introduction to nHair, Creating Basic hair style, Creating a dynamic curve simulations.

**Introduction to Video Compositing techniques and Colour Keying** advanced 2D compositing and Ink paint techniques. Creating color models as per the model sheets. Creating color pallets as required paint and ink fields. Understand the dope sheets / X- sheets in production level. Arranging and adjusting the layers as per X- sheet. Advanced panning of camera and background, multiple cameras for showing depth in-between background, over lay and character layers. Introduction to compositing special effects into a scene using 3d graphics and 3d special effects in 2d layers. Concepts for Broadcast animation for logos, channel IDs and montages. Multi-Layer Compositing, Special Effects, Superimposition and Titling. Exporting various file format outputs as per the end user requirements.

**Introduction to Audio Editing** sound design in animated films, including recording, gathering audio, editing, mixing, and audio design principles, high-end Pro Tools editing, including use of plug-ins to premix a soundtrack, sound is a catalyst for the imagination, master/slave relationship of picture/sound, sound and memory, psychological implications of sound. Psycho-acoustics and the physics of sound. voice-over, musical composition, psychological role of Sound and aesthetic

**3D Compositing and Color Grading:** Compositing in Z axis, Creating camera and lights in compositing program, Creating shadows and reflections using layers, Blending videos, Roto Paint, using particles and advanced effects, 3D camera tracking and polishing, Integrating 3 D elements. Using Color correction tools, curve tool, masking and Isolating elements, Using adjustment layer for color grading, Noir theme, color and its meaning and impact on audience.

**Advanced Video Editing and Visual Story Narration:** post-production strategies, narrative structure, editing rhythms and cutting for performance logging and organization exercises; cutting a short scene provided by the instructor; analysis of editing in a feature film; and active participation in class discussions of student.

#### Section – B(1)

1. Exercises: 3d Disintegration/Shattering effects.
2. Exercises: Smoke Simulation and Rendering.
3. Exercises: Creating Ocean and waves.
4. Exercises: Creating Fire Blast Simulation-Configuring Container and emitter properties.
5. Exercises: Creating Fire Blast Simulation-Creating Debris.
6. Exercises: Creating Rain and fog.

#### Section – B(2)

1. Exercises: Video stabilization.
2. Exercises: Chroma Keying & Matte.
3. Exercises: 2D Camera Tracking.
4. Exercises: 3D Camera Tracking.
5. Exercises: 3D Camera Tracking and Alignment.
6. Exercises: Motion Graphics-Planning and Asset preparation
7. Exercises: Motion graphics- Final Animation
8. Exercises: Rotoscopy-Biped
9. Exercises: Rotoscopy-Quadraped.

#### Section – B(3)

1. Exercises: Adding BG Music.
2. Exercises: Mixing two tracks.
3. Exercises: Recording audio.
4. Exercises: Noise reduction Process.
5. Exercises: Adding Effects.
6. Exercises: Creating Physiological Effects
7. Exercises: Foley Lab.

#### Section – B(4)

1. Exercises: 3D camera tracking and exporting to 3D Program.
2. Exercises: adjusting Track Points.
3. Exercises: Set extension.
4. Exercises: Match Moving.
5. Exercises: matching Lighting

#### Section – B(5)

1. Creating Titles using text and images.
2. Storytelling with images.
3. Editing using video effects.
4. 180-degree dialogue shot editing.
5. Editing a Montage (Future, Past).
6. Shooting and editing a documentary- Shoot/Acquiring a footage
7. Shooting and Editing a documentary-Rough cuts
8. Shooting and Editing a documentary-Syncing Audio and Video
9. Shooting and Editing a documentary-Final cut and Export to media format.

## Semester 4 General Content

### L6 – Sem 4 – GC – Physics:

Section – A

**OPTICS:**

Reflection, Refraction, Spherical mirror, Concave mirror, refractive index, Relation between focal length and radius of curvature. Laws of Refraction, Snell's law, Dispersion, wave front, interference, diffraction.

**CURRENT ELECTRICITY:**

Resistance, Capacitance and Inductance, Ohm's law, Current and Voltage, Conductors, Insulators, Semiconductors and Super conductors and their applications, Alternating current and Direct current, Transformers and their constructions, rectification.

Section – B

**List of Experiments:**

- 1) To find the focal length of a convex mirror, using a convex lens.
- 2) To find the refractive index of glass.
- 3) To find the refractive index of water.
- 4) To find the focal length of a concave mirror.
- 5) Verification of ohm's law.
- 6) To determine effective resistance of two resistances connected in series.
- 7) To determine effective resistance of two resistances connected in parallel.
- 8) To determine resistance per unit length of the wire.

### L6 – Sem 4 – GC – Physics:

#### **Unit 1: Number Systems, Boolean algebra and Logic gates**

**Number Systems:** Introduction to decimal, binary Inter – Conversion. Addition, Subtraction, Multiplication and Division in binary Number system.

1's and 2's Complement method in binary number system. Subtraction using 1's and 2's compliment

**Boolean Algebra:** Laws of Boolean Algebra, Logic gates - AND gate, OR gate, NOT gate, NAND gate and NOR gate Logic symbol and truth table

De – Morgan's theorem, simplification of Boolean expressions. Logic circuit for Boolean expressions and vice versa.

Universal gates - NAND gate and NOR gate.

## **Unit 2: Logic circuit and Memories**

**Combinational logic circuit:** Half adder, Full adder, half subtractor, Full subtractor.

**Sequential logic circuit:** Flip – flop: RS, D, JK, and T flip - flop.

**Shift registers:** SIPO, SISO, PISO and PIPO.

**Digital computer:** Block diagram of digital computer and function of each block.

**Semiconductor Memories:** Idea of different types of semiconductor memories (RAM, ROM, PROM, EPROM and EEPROM).

## **L6 – Sem 4 – GC – Computer Science:**

Section – A

Unit 1:

Classes in Python: Introduction, Namespaces, Scope Rules, LEGB Rule, Defining Classes, Importance of self, Class Attributes v/s Instance Attributes, Instances attributes, Adding methods dynamically, Accessing Attributes and methods, Accessing Methods, Built in class attributes, Private Members - Limited Support, Data Hiding, Static methods, Destroying Objects (Garbage Collection) Inheritance: Introduction, types of Inheritance, Method-I- By using super() function, Method-II- By using name of the super class, Multiple Inheritance, Overriding Methods, Abstract Methods,

Unit 2:

Linear List Manipulation- Data Structures, Implementation of List in memory, Sequential Memory Allocation, List Operations, Traversal in a List, Insertion of an element in a sorted list, Searching Techniques, Sorting a list.

Stacks and Queues in List: Stack , Push operation, Pop operation, Traversal in a stack, Expression- Conversion of an infix expression to postfix expression, Evaluation of Postfix Expression

Queue- Queue operations,

Data File Handling: Introduction, File access modes:

Exception Handling & Generator Functions: Generator Functions, Advantages of using generator

### **Reference Books:**

Beginning Programming with Python for Dummies by stef Maruch & Aahz Maruch.

