

SWAMI VIVEKANAND UNIVERSITY, SIRONJA, SAGAR (M.P.)



SYLLABUS

For

PG Diploma in Animation

Course Code: PGDAN

Department of Animation

Faculty of Animation & Multimedia

Duration of Course : 1 Year

Examination Mode : Semester

Examination System: Non Grading

Swami Vivekanand University, Sironja Sagar (M.P.)

2014-2015



Semester -I

Subject-Foundation Mathematics

Course Code- PGDAN 0101

UNIT – I

Marks :14

Algebra: Indices, exponent and logarithm, Computer algebra system and basic techniques of solving problems, Working with variables and expressions, Factorization of simple expressions; factor theorem, Functions and graphs, Quadratic equations in one unknown, Linear and quadratic inequalities in one variable, Simultaneous equations in two unknowns, Solving equations by computer algebra system calculators or software and graphical methods, Arithmetic sequences and geometric sequences and their applications (e.g. growth, depreciation and mortgages)

UNIT – II

Marks :14

Geometry: Angle properties in circles, Tangent properties in circles

UNIT – III

Marks :14

Elementary Trigonometry, Trigonometric ratios and their graphs; degrees and radians, Simple trigonometric equations, Graphing trigonometric functions. Problem solving on Trigonometry: Sine and cosine formulas, Reduction principle, Problem solving methods

UNIT – IV

Marks :14

Coordinate Geometry: Plane rectangular coordinates, distance formula and section formula, Slope of a straight line, Equation of a straight line in different forms

UNIT – V

Marks :14

Basic Statistics: Probability in daily life, Appreciation the application of combination and permutation, Plotting distribution and problem solving.

References:

1. Tynan, Dowsey, Ball , "CAS-Active Mathematics", Macmillan, 2004
2. Margaret L. Lial, John Hornsby, David I. Schneider, Trigonometry, 9/E, Pearson.
3. Muktibodh A.S., Mohgaonkar S.D., Datta Ushri, Algebra and Trigonometry, PHI.
4. K. R. Choubey, Ravikant Choubey, Chandrakant Choubey, 2D Coordinate Geometry, Pearson
5. Algebra 1 and Algebra 2 with Trigonometry, Pearson Education.
6. Tom Carson, Bill E. JorPGDAN, Elementary and Intermediate Algebra, 3/E, Pearson.
7. B. L. Agarwal, Basic Statistics, New Age International.



Subject-2D Computer Graphics and Programming in C
Course Code- PGDAN 0102

UNIT – I

Marks :14

An Introduction Graphics System: Application of computer graphics, Graphics Systems: Video Display Devices, Raster Scan Systems, Random Scan Systems, Graphics Monitors and Work Stations, Input Devices, Hard Copy Devices, Graphics Software

UNIT – II

Marks :14

Output Primitives and Attributes of Output Primitives: Output Primitives Points and Lines, Line Drawing Algorithms, Circle Generating Algorithms, Scan-Line Polygon Fill Algorithm, Inside-Outside tests, Boundary-Fill Algorithm, Flood Fill Algorithm, Cell Array, Character Generation Attributes of Output Primitives: Line attributes, Color and Grayscale levels, Area fill Attributes, Character Attributes, Bundled Attributes. Antialiasing.

UNIT – III

Marks :14

Two-dimensional Geometric Transformations: Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations, Reflection and Shearing Two-Dimension Viewing: The viewing Pipeline, Window to view port coordinate transformation, Clipping Operations, Point Clipping, Line Clipping, Polygon Clipping, Text Clipping, Exterior Clipping

UNIT – IV

Marks :14

Programming in C: Overview of C, Constants, Variables and Data Types, Operators and Expressions, Managing Input and Output, Decision Making - Branching and Looping. Handling of Character Strings, Arrays, User-defined Functions - Definitions - Declarations - Call by reference - Call by value, Structures and Unions, Pointers, the Preprocessor directives, File management.

UNIT – V

Marks :14

Graphics on PC, Initialize Graphics Mode, Functions used In Graphics - Drawing a Point on The Screen, Drawing- lines, rectangle, ovals, circles, arcs, polygon, filling colors, Using Text in Graphics Display.

References:

1. James D. Foley, Andres Van Dam, Steven K. Feiner, and John F. Hughes, Computer Graphics- Principles and Practice, 2/e, Pearson Education(2006).
2. Donald Hearn and M. Pauline Baker, Computer Graphics-C version, 2/e, Pearson Education.
3. Francis S. Hill Jr, Computer Graphics using open GL, 2/e. Pearson Education.



Subject-3D Computer Graphics and Modeling
Course Code- PGDAN 0103

UNIT – I

Marks :14

Review On Basic Bitmapped Graphics: Pixels, Coordinate system, frame buffer, Color representation, palette

UNIT – II

Marks :14

3D Graphics Pipeline: 3D coordinates: homogenous coordinate system. Graphical Object representations: surface modelling, Vertices, polygons, Objects local coordinate World representations: putting object into the virtual world, world coordinate, transforms (translation, scaling and mirroring, rotation). View point: view coordinate system, visibility of objects . Projection: device coordinate system, view frustum, clipping, perspective projection, orthogonal projection Rasterization: screen coordinate system, scan-conversion, view-port translation

UNIT – III

Marks :14

Attributes Of Object Models : Color, shading, texturing; Lighting sources and reflection models Shading models: flat shading, smooth shading, Phong shading Transparency: color blending Texture mapping: texture image, texels, multi-level texturing; Visibility: back-culling, hidden surface removal, Painter's algorithm, z-buffer.

UNIT – IV

Marks :14

Use Of Commercial Modeling Tools: e.g. 3Ds; basic geometry primitives, transformation tools, mirror and lathe Vertex/edge/polygon/splines editing, Low-polygon modeling, pops modeling from basic primitives, patch modeling, deformation tools; NURBS character; Color, Texture, Lights, and Camera.

UNIT – V

Marks :14

Using Scripts In The Modeling Tools: e.g. MaxScripts; Loading models files, and positioning models; Deforming of the models; Adding textures. Adding Lights and Cameras.

References:

- 1 Foley et al, "Computer Graphics: Principles and Practices" 2nd Edition, Addison Wesley
- 2 Alan Watt, "3D Computer Graphics", Third Edition, Addison Wesley.
- 3 P. Cooley, "The Essence of Computer Graphics", Pearson Education.



Subject- Design Theories and Appreciation
Course Code- PGDAN 0104

UNIT – I

Marks :14

Introduction to aesthetic appreciation and the consideration of design in achieving creative, sensitive and innovative designs solutions. Basic principles of design using color, texture, typography and graphic composition. Introduction to design Theory and commercial criteria relevant to specific disciplines.

UNIT – II

Marks :14

Introduction to idea generation and brainstorming techniques. Speculative and practical activities that involve the student in the development of visual, creative, manipulative and organizational methodologies exercised in a multimedia environment. Introduction to Time-based media of motion graphics and animation appreciation.

UNIT – III

Marks :14

Introduction to basic typography and the consideration of design in achieving creative, sensitive and innovative designs solutions. Speculative and practical activities that involve the student in the development of visual, creative, manipulative and organizational methodologies exercised in a multimedia environment.

UNIT – IV

Marks :14

Introduction to the design process from project specification, investigation, development through presentation in multimedia titles or Internet projects. Techniques for gathering, organizing and managing images and

UNIT – V

Marks :14

Interactive user interface design through the understanding and role of visual perception in communication and the multimedia area through visual hierarchy, navigation, graphic user interface, storyboard preparation and scripting.

References:

- 1 Samara & Timothy, "Design evolution: Theory into practice: a handbook of basic design principles applied in contemporary design Beverly", Mass: Rockport, c2008
- 2 Linz & Barbara, "Colour=Farbe=Couleur", Konigswiner, Germany: h.f. ullmann,
- 4 Adams & Sean, " Logo design workbook: a hands-on guide to creating logos/ Seab
- 3 Adnsb & Noreen Morioka with Terry Stone", Gloucester, Mass: Rockport Publishers,
- 4 Kevin Hedgpeth, " Exploring character design", Clifton Park, NT: Thomas /Delmar Learning.
- 5 Saltz Ina, "Typography essentials: 100 design principles for working with typr", Beverly Mass: Rockport Publishers.



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Subject- Practical-I: Web Game Lab.

Course Code- PGDAN 0105

Lab. Assignment shall be carried out using C Lab. Hands-on practices on programming shall be carried out using C programs to improve programming skills, and acquiring the testing and debugging techniques. Following features of Flash Animation tool to be familiarized: Flash workflow & Workspace, Working with Flash documents, Using Flash drawing and painting tools, working with graphics objects, Using symbols, instances and library assets, creating animation.

Subject- PRACTICAL-II: 3D Graphics Lab.

Course Code- PGDAN 0106

Section I: Students should familiarize with basic 3D modeling skills using commercial tools like 3ds Max, Animation Master, or Maya supporting 3D modeling. Students should gain hands-on experience in 3D modelling using modelling tools and through script-programming exercises. Section II: Example assignments Designing greetings cards, Magazine covers, Nature scene (winter) digital painting, Nature scene (summer) digital painting, a collage of Indian Art & Culture, Make a Collage of wildlife Animals, Make your own cartoon character, Plan a story of that character & make its back grounds in three/four frames, Make Posters on Nature / earth, Make lists of Animated film & special effect

Subject- PRACTICAL-III: Project Work

Course Code- PGDAN 0107

Student shall carry out the project work to implement 2D/3D world of graphical objects through script- programming. The students are required to carry out project work, in a group not exceeding two, under the guidance of the course teacher in the department. Student shall submit two copies of the project work to the department for evaluation



Semester –II
Subject- Web Game and Animation Practices
Course Code- PGDAN 0201

UNIT – I

Marks :14

Web Animation Authoring Tools: Editing environment, file formats, Vector based drawing, Importing vector graphics and raster graphics, Text and fonts, Creating "symbols": graphics, movie clips and buttons, Moving, scaling, and rotating "instances". Using library, scenes and layers. Frames and animation: "keyframes", frame-by-frame animation, motion and shape tweening, Adding sound, Testing, optimization and exporting animations, integration with interactive Web page

UNIT – II

Marks :14

Web Animation Creation: Script development, character/background/prop design, Storyboard, animatics, Layout, rough animation and finish animation. Techniques for conveying motion: anticipation, overshooting, squash and stretch, walking, rotoscoping.

UNIT – III

Marks :14

Scripting Techniques: Basics of an industrial scripting language for Web game and animation, e.g. ActionScript: syntax, basic construct, script developing environment, Frame actions, Button Actions, Movie control, Movie Clip Actions, Attaching, duplicating, removing, dragging and dropping movie clips, Using variables, operators, properties and events, Conditional statements, loops, arrays, Detecting Collisions, Working with text: static, dynamic, and input text. Using Forms to Gather User Data Including Theory scripting file.

UNIT – IV

Marks :14

Web Game Creation: Game Basic: game Theory, game concept, game play. Game Mathematics: Cartesian coordinates, projection, vectors.

UNIT – V

Marks :14

Basic Physics: speed, velocity, and acceleration, gravity and friction, Collision detection, Tile-based worlds, isometric worldview, Introduction to game Artificial Intelligence

References:

- Todd Perkins, Adobe Flash CS3 Professional Lynda Weinman's Hands-On Training, Lynda.com/books.
- Jobe Makar, Ben Winiarczyk, Macromedia Flash MX 2004 Game Design Demystified, Macromedia Press.
- Alex Michael, Animating with Flash MX: Professional Creative Animation Techniques, Focal Press.
- Kit Laybourn, The Animation Book, Three River Press.
- Sandro Corsaro & Clifford J. Parrott, Hollywood 2D Digital Animation: The New Flash Production
- Revolution, Thomson Course Technology.
- Chris Georgenes; Justin Putney, Animation with Scripting for Adobe® Flash® Professional CS5 Studio
- Techniques, Adobe Press



Subject- Multimedia Technology, Production and Services
Course Code- PGDAN 0202

UNIT – I

Marks :14

Video Technology: Analogue video: field, frame, frame rate, interlace, format e.g. NTSC and PAL; Color representations and color spaces; Concept of digital video: quantization, resolution, sampling rate, pixel depth; Compression: techniques, standard (e.g. HDTV) and file types

UNIT – II

Marks :14

Audio Technology: Basic acoustics, Nature and physics of sound, human perception of sound; Concept of digital sound; Compression: techniques, standard and file types; Surround sound.

UNIT –III

Marks :14

Production: Technical setup of professional audio and video production studios; Production techniques: set preparation, lighting, camera, chroma, key, sound recording etc; Post-production techniques: digitization, editing, pace and rhythm, audio mixing and sweetening, preparation of rough cut and fine cut etc.

UNIT – IV

Marks :14

Storage And Distribution: Optical disks (e.g. DVD, EVD): coding techniques, logical and physical formats, standards, mastering, production, copy protection. Magnetic disk (e.g. RAID): levels, structure, performance and reliability issues.

UNIT – V

Marks :14

Multimedia Services: Examples: Digital broadcasting, digital cinema, set-top box, video conferencing; Architectures of typical interactive multimedia services. Case studies: Campus TV, interactive TV. Production And Delivery: Production and delivery process, Encoding and authoring, Addition of effects for live events e.g. virtual set and chroma key. Underlying Technology: Voice technology- Voice identification, speech recognition, text-to-speech, VoIP, Voice XML; Underlying protocols (e.g. SIP, UDP, TCP), Factors affecting performance and quality of services, Platform And Scripting: Server and operating systems e.g. Helix; programming models and syntax _ Applications design and case studies e.g. speech application design, VoIP application design

References:

- Nigel Chapman and Jenny Chapman, Digital Media Tools, John Wiley & Sons, Ltd.
- Ken C. Pohlmann, Principles of Digital Audio, McGraw Hill
- Murst Tekalp, Digital Video Processing, Prentice Hall.
- Zettl, Television Production Handbook, Wadsworth Pub Co, 10th edition.
- Mack, S., "Streaming Media Bible", Hungry Minds Inc.
- Margherita Pagani, Multimedia and Interactive Digital TV: Managing the Opportunities Created by
- Digital Convergence, Idea Group Publishing.
- Steve Curran, Steven Curran, Convergence Design: Creating the User Experience for Interactive
- Television Wireless and Broadband, Rockport Publisher.
- Mark Gawlinski, Interactive Television Production, Focal Press.
- A. Larson, VoiceXML: Introduction to Developing Speech Applications, Prentice Hall.



Subject- Interactive Entertainment Systems
Course Code- PGDAN 0203

UNIT – I

Marks :14

Introduction To Circuits: Elementary electrical/electronic circuits and its drawing. Potential difference, Ohms and Amps, Ohm's law. Resistors, potential dividers, variable resistors. Capacitor: construction, charging and discharging, time constant. Using ammeters and voltmeters.

UNIT – II

Marks :14

Real World Signals: Analog signal, digital signal, A/D converters. Wave, wavelength, frequency, wave equation $v = f\lambda$, light wave, sound wave. Wavelength of color, primary and secondary color. Musical notes, simple song, RTTTL.

UNIT – III

Marks :14

Output, Input, Sensor And Actuator: I/O port, parallel I/O, serial I/O etc. Output: LED, bulb, 7 Segment LED, relay, buzzer. Input: push button, switch. Sensor and actuator: Light, temperature, photoresistor, motor.

UNIT – IV

Marks :14

Interaction Techniques: Introduction to multitasking, complex response, random numbers, debouncing

UNIT – V

Marks :14

Introduction To Microcontroller: Microcontroller as a controller of an interactive entertainment system. Development tools and evaluation board _ Interactive entertainment system case studies: interactive toy, hand held game console etc.

References:

1. PGDAN O'Sullivan, Tom Lgoe, Physical Computing, Sensing and Controlling the Physical World with Computers, Thomson Course Technology.
2. Andy Lindsay, What's a Microcontroller? Student's Guide, Parallax, Inc., version 2.1
3. Andre LaMothe , The Black Art of Video Game Console Design, Sams.



Subject- Communication Skills
Course Code- PGDAN 0204

UNIT – I

Marks :14

Introduction to Essential English Grammar: Punctuation and Capitalization, Nouns and Verbs, Pronouns, Adjectives, Prepositions, Conjunctions, Tenses, Active and Passive Voice, Use of Articles, Common Errors in Usage, Words Commonly Misspelt.

UNIT – II

Marks :14

The Process of Communication: Communication, the process of communication, barriers of communication, different types of communication, characteristics and conventions of conversation, conversational problems of Second/foreign language users, difference between conversation and other speech events. Telephone Techniques: Speaking and listening, conference calls, vocabulary, writing and listening, grammar and usage, pronunciation.

UNIT – III

Marks :14

Job Applications and Interviews: Reading, Curriculum vitae, Preparing for an interview, Listening and Speaking in the Interviews. Group Discussions: Group Discussion, Study skills, language focus, speaking.

UNIT – IV

Marks :14

Managing Organisational Structure: Role of a manager, Leadership, Language focus, writing reports, Pronunciation. Meetings: Successful meeting, One to one meeting, editing, criteria for successful meetings, Reporting verbs, memos. Taking notes and preparing minutes: Taking notes, preparing minutes, grammar.

UNIT – V

Marks :14

Presentation Skills: Presentation skills, Importance of body language in presentations, pronunciation, visual aids, podium panic, speaking.

References:

1. Herta A Murphy, Herbert W. Hilderbrandt, Jane P Thomas, Effective Business Communication, 7/e, Tata McGraw Hill Publication
2. Huckins Thomas, Technical Writing and Professional Communication, McGraw Hill Publication
3. Penrose, Rasberry, Myers, Business Communication for Managers - An Advanced Approach, 5/e, Thomson Publication.
4. Meenakshi Raman & Sangeeta Sharma, Technical Communication - Principles and Practice, Oxford University Press, Sixteenth Impression 2007.
5. Meenakshi Raman & Prakash Singh, Business Communication, Oxford University Press, Seventh Impression 2008.
6. Bovee, Thill, Schatzman, Business Communication Today, 7/e, Pearson Education.
7. Wren & Martin, High School English Grammar and Composition.
8. Janet Whitcut, Better Word Power, Oxford University Press.



Subject- Practical-I: Web Game Lab.

Course Code- PGDAN 0205

Assignments related to web animation creation and web game creation shall be carried using scripting techniques. Appropriate software like Flash/JAVA Script/Blender, etc. shall be used for implementation of the same.

Subject- Practical-II: (OE) Multimedia Lab..

Course Code- PGDAN 0207

Assignments related to multimedia technology, production and services as studied in the paper shall be carried out. Interactive entertainment system case studies shall be carried out during this lab.

Subject- Project Work

Course Code- PGDAN 0207

1. The candidates are required to carry out a independent project work during this practical hours. The synopsis of the project work to be carried out shall be submitted to the department in the beginning the semester course.
2. Each student shall carry out the project work individually under the guidance of the course teacher in the department.
3. The Project topics should be based on papers studied in the course or beyond.
4. Student shall submit two copies of the project work to the department for evaluation.
5. Theory Question Paper Pattern
- 6.
7. Maximum marks for Theory paper is 80.
8. There shall be 8 questions of 14 marks each.
9. Each question may have two to three sub questions.
10. Students are expected to attempt any five full questions
11. Practical Question Paper Pattern
12. Maximum marks for all practicals except project work is 40. Maximum marks for Project work is 80.
13. There shall be two assignments in the question paper from the syllabus prescribed for the lab. for each
14. practical examination.
15. The student is expected to write layout/ algorithm and program code for the assignments.
16. Implementation of both the assignments shall be carried out.
17. In case of project, the students are expected to present the work through ppt slides along with the
18. demo of the application he/she has developed during the project work.
19. There shall be viva-voce for practical/project work during the examination.