DEPARTMENT OF MEDIA SCIENCES
ANNA UNIVERSITY, CHENNAI

VISION
- To offer quality media studies and research, using state-of-the-art images for building an inter-disciplinary knowledge base, so as to contribute to development and democracy.
- To produce creative and technically apt professionals for the media industry.
- The theoretical and practical media courses taught in the PG programme will improve, explore, innovate and implement core media techniques by “learn by doing” philosophy.
- The PG programme will continue to prepare students for professional and personal success in today’s exciting and innovative media landscape.

MISSION
- To create an enabling environment to nurture ideas, freedom of expression, creativity and scholarship, and develop leaders in the arena of media and mass communication.
- The mission of the PG programme is to excel in media education on fundamental media concepts, values and skills in various platforms that focus on problem solving, critical thinking, innovation and communications.
- To promote the understanding of ethical and legal implication of all forms of media and the importance of cultural and intellectual diversity, techno-savvy, civic engagement and social responsibility in preparing the students for leadership role in media industry.
- To enable students to understand the role of media in nation building.
- To instill a sense by creating and innovation among journal minds for better societal contribution.
ANNA UNIVERSITY, CHENNAI
UNIVERSITY DEPARTMENTS
M.Sc. MULTIMEDIA (specialization in VISUAL COMMUNICATION) (TWO YEARS)
REGULATIONS 2019
CHOICE-BASED CREDIT SYSTEM

1. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

1. To impart specialized skills required to design and develop interactive multimedia content.
2. To empower multimedia students to focus on creating interactive experiences for users through engaging interfaces through digital media.
3. To provide students with strong foundation in media studies, creativity and information technology.
4. To enhance their ability to effectively disseminate information and messages by incorporating vital multimedia elements that attract and retain the attention of the users.
5. To prepare students to carry out multimedia research that will have benefits for the society.

2. PROGRAMME OUTCOMES (POs):

After the completion of the two-year period of study, the following outcomes are expected:

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<tr>
<th>PO #</th>
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<tr>
<td>1</td>
<td>Students will be able to impart a technically-sound working knowledge of different multimedia software required for various purposes.</td>
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<tr>
<td>2</td>
<td>Students should be able to demonstrate necessary skills required to produce interactive multimedia content.</td>
</tr>
<tr>
<td>3</td>
<td>Students should be able to apply various creative techniques and critical thinking methods in multimedia production and problem solving.</td>
</tr>
<tr>
<td>4</td>
<td>Students will be able to independently carry out research and find solution to the identified problems.</td>
</tr>
<tr>
<td>5</td>
<td>Students will have an ability to write and present them efficiently to provide novel and greater enhanced experiences to users.</td>
</tr>
<tr>
<td>6</td>
<td>Students will be able to develop socially relevant products with multimedia elements by applying technical knowledge and ethical principles.</td>
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</table>
3. **PROGRAMME SPECIFIC OUTCOMES (PSOs):**

By the completion of the M.Sc. MULTIMEDIA (specialization in VISUAL COMMUNICATION) programme, the students will have the following programme specific outcomes.

1. Students will gain broad knowledge on both designing and technical aspects related to multimedia content creation.
2. Students will have the necessary skills to design, develop and analyse different multimedia content.
3. Students will have the flexibility to choose their career from a variety of diverse opportunities that are available in multimedia industries.
4. Students will be able to integrate traditional media and digital media ethically.
5. Students will have in-depth knowledge on research methodology and will be able to pursue research and identify/implement new practices that will be beneficial to the society.

4. **MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOMES**

A broad relation between the programme educational objective and the programme outcome is given in the following table.

<table>
<thead>
<tr>
<th>Programme Educational Objectives</th>
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# M.Sc. Multimedia (Specialization in Visual Communication) (Two Years) Regulations 2019

## Choice-Based Credit System

### Curricula and Syllabi

#### Semester I

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*Audit Course is Optional

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# SEMESTER IV

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AUDIT COURSES (AC)
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<td>Unnat Bharat Abhiyan</td>
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Total Credits: 0

SUMMARY

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<tr>
<th>S.No.</th>
<th>M.Sc. MULTIMEDIA (specialization in VISUAL COMMUNICATION) (TWO YEARS)</th>
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TOTAL CREDIT | 23 | 21 | 23 | 18 | 85 |
OBJECTIVES
- To impart knowledge on news reporting.
- To learn the art of script writing.
- To understand how to communicate through broadcast media.
- To identify best practices for script writing and story-boarding.
- To be informed of laws and ethical practices in the media industry.

UNIT I  WRITING  9

UNIT II  IDEATION  9

UNIT III  SCRIPT WRITING  9
Identifying suitable story concept/idea – Anatomy of a Screenplay - Beginning/middle/ end elaborating and breaking up the selected concept into scenes - Elaborating individual scenes – Slug line - Action – Dialogue - Creating a detailed script / screenplay.

UNIT IV  STORY-BOARDING  9
Sketching the characters’ personalities/ costumes/ poses – Sketching the features of backgrounds / exteriors or interiors of buildings in different perspectives – Developing sketches of props/accessories/ weapons/ vehicles - Improvising these sketches with respect to the theme – Pairing and synchronizing dialogue with digital images – Writing the actions of each board to complement the digital images – Indicating placement of sound effects and original music.

UNIT V  LAW, ETHICS AND IPR  9

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Understand the nuances of writing for various media.
- Efficiently develop and write scripts for fictional programmes and non-fictional programmes.
- Use various commercial software for script and screenplay, etc.
- Prepare storyboards.
- Understand the legal and ethical aspects of the media.

REFERENCES
1. David Harland Rousseau and Benjamin Reid Phillips, Story-boarding Essentials: SCAD Creative Essentials (How to Translate Your Story to the Screen for Film, TV, and Other Media), Watson-Guptill, 2013.

<table>
<thead>
<tr>
<th>Course Code</th>
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<td>MV5102</td>
<td>USER EXPERIENCE DESIGN</td>
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**OBJECTIVES**
- To identify the users and learn various methods to collect user behaviour data.
- To develop a deep understanding of business-centred design.
- To create efficient prototype to communicate and validate the design definition.
- To apply UX process to web, mobile and small screen device.

**UNIT I**
**INTRODUCTION TO DESIGN & CONCEPTUALIZING UX**

**UNIT II**
**USER RESEARCH TECHNIQUES**

**UNIT III**
**WIREFRAMING, PROTOTYPING & USER TESTING**

**UNIT IV**
**UX FOR MOBILE & SMALL SCREEN DEVICES**
UNIT V  BASICS OF HTML5 & CSS3

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able:
- To understand the UX principles.
- To differentiate between businesses-centred design and user-centred design.
- To understand testing scenarios for usability.
- To understand the prototyping for mobile and small screen devices.
- To design and develop content for different screen resolutions

REFERENCES

MV5103  AUDIOGRAPHY AND VIDEOGRAPHY  L T P C
3 0 0 3

OBJECTIVES
- To understand the evaluation of audio and video production.
- To inculcate the sense of production aesthetics in terms of sound recording, compositions, and continuity.
- To gain knowledge of studio equipment usage and benefits.
- To understand the various equipment available for production and the selection of equipment for different production requirements.
- To understand the various production techniques for audio recording.

UNIT I  INTRODUCTION TO AUDIO AND VIDEO

UNIT II  AESTHETICS OF PRODUCTION
Types of shots and camera angles – Scene strategies: Changing the line of action, creating a visual point of view, group interactions, moving through space and time, cheating on film – Visual Pre-production: Aesthetics of production, principles of continuity, closed and open frame – 5 Shot rule – Pick-up patterns of microphone – Types of the lens – Types of camera mounting equipment – Understanding Sound – Frequency (Pitch), Amplitude (Loudness), Quality (Timbre), and Velocity – Different types of camera movements.
UNIT III  COMPOSITION TECHNIQUES  9

UNIT IV  FUNDAMENTAL OF LIGHTS AND SOUND  9

UNIT V  INTRODUCTION TO STUDIO ATMOSPHERE  9
Video and audio monitors – Colourscope – Crew roles and responsibilities – Types of audio production scenarios – Video and audio studio management – Sound Control Room and Production Control Room – Mono and Stereo Sound – Different genres of video programmes.

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Know how to write a script for various genres of production.
• Make the selection of scanning, format, and codec based on the platform.
• Know which equipment would be more apt for the production.
• Follow ethical and social values while representing society in a good way.
• Handle the camera and related equipment with expertise.

REFERENCES

MV5104  THEORIES OF VISUAL ANALYSIS  L T P C
3 0 0 3

OBJECTIVES
• To understand the nature and purpose of visual analysis.
• To explore how to blend different types of approaches and useful tools with visual content.
• To understand different types of visual breakdown and theories related to it.
• To study the models for analysis.
• To understand different types of visual analysis and evaluations.
UNIT I  INTRODUCTION TO VISUAL ANALYSIS  9
Visual analysis: Definition and different perceptions – Methods of visual analysis – Scope of visual communication – Unit of analysis – Image analysis – Text, context, social practice in media.

UNIT II  VISUAL AESTHETICS  9

UNIT III  QUANTITATIVE APPROACH  9

UNIT IV  VISUAL ANTHROPOLOGY  9

UNIT V  CRITICAL ANALYSIS AND EVALUATION  9

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:

- Understand the scope and limitations of visual media.
- Identify the range of approaches to visual analysis.
- Learn the different visual representation techniques and its applications.
- Learn to apply the theoretical and empirical tools of visual analysis.
- Understand the theories of visual analysis.
- Learn to analyze and evaluate visual content.

REFERENCES

MV5105  PYTHON PROGRAMMING  

OBJECTIVES
- To know the basics of algorithmic problem solving.
- To develop Python programs with conditionals and loops.
- To define Python functions and use function calls.
- To use Python data structures – lists, tuples, dictionaries.
- To do input/output with files in Python.
UNIT I  INTRODUCTION TO COMPUTING AND PROBLEM SOLVING  9
Fundamentals of computing – Computing devices – Identification of computational problems –
Pseudo codes and flowcharts – Instructions – Algorithms – Building blocks of algorithms –
Introduction to Python programming – Python interpreter and interactive mode – Variables and
identifiers – Arithmetic operators – Values and types – Statements.

UNIT II  CONDITIONALS AND FUNCTIONS  9
Operators – Boolean values – Operator precedence – Expression – Conditionals: If-else
constructs – Loop structures/iterative statements – While loop – For loop – Break statement –
Function call and returning values – Parameter passing – Local and global scope – Recursive
functions.

UNIT III  SIMPLE DATA STRUCTURES IN PYTHON  9
Introduction to Data Structures – List – Adding items to a list – Finding and updating an item –
Nested lists – Cloning lists – Looping through a list – Sorting a list – List concatenation – List
slices – List methods – List loop – Mutability – Aliasing – Tuples: creation, accessing, updating,
deleting elements in a tuple, tuple assignment, tuple as return value, nested tuples, basic tuple
operations – Sets.

UNIT IV  STRINGS, DICTIONARIES, MODULES  9
Strings: Introduction, indexing, traversing, concatenating, appending, multiplying, formatting,
slicing, comparing, iterating – Basic Built-In String Functions – Dictionary: creating, accessing,
adding items, modifying, deleting, sorting, looping, nested dictionaries built-in dictionary function
– Finding key and value in a dictionary – Modules – Module loading and execution – Packages –
Python standard libraries.

UNIT V  FILE HANDLING AND EXCEPTION HANDLING  9
Introduction to Files – File path – Opening and closing files – Reading and writing files – File
position – Exception: Errors and exceptions, exception handling, multiple exceptions – Case
studies.

TOTAL: 45 PERIODS

OUTCOMES
On completion of the course, students will be able to:
• Develop algorithmic solutions to simple computational problems.
• Develop and execute simple Python programs.
• Write simple Python programs for solving problems.
• Decompose a Python program into functions.
• Represent compound data using Python lists, tuples, dictionaries etc.
• Read and write data from/to files in Python programs.

REFERENCES
1. John V Guttag, Introduction to Computation and Programming Using Python, Revised and
4. Reema Thareja, Python Programming: Using Problem Solving Approach, Oxford University

MV5111  DRAWING LAB  L T P C
0 0 4 2

OBJECTIVES
To engage in the creative process or interpretive performance required for a visual artist.
• To understand how lines can be used to describe, model, or translate all of visual reality.
• To make students understand the principles of art.
• To introduce them to the basics of logo designing.
• To make them aware of the different styles of painting.
UNIT I INTRODUCTION TO DRAWING 12
The elements of art – Line – Horizontal, vertical, diagonal / slanting, zigzag, and curve shape & form – Geometric (square, circle triangle, rectangle, and oval); and Organic (Freeform), Space – Distance between, around, above, below and within things.

UNIT II PRINCIPLES OF ART 12
Balance – Formal, informal and radial, variety – Combining one or more elements to create interest by adding slight changes – Harmony – Blending elements, emphasis – Stand out, contrast, proportion – Relationship between two or more objects – Movement – Viewer's eye throughout the work – Rhythm – Repeating an element to suggest vibration, pattern – Unity, completeness.

UNIT III COLOUR AND COMPOSITION 12
Definition, Hue, Saturation and Brightness – Historical background – Additive and Subtractive colours – Theory of colours – Colour wheel – Warm and Cool colours – Primary, Secondary and Tertiary colours and the right combination of these colours for various purposes – Colour Symbolism and Psychology – Use of colours in painting, printing, creative production – Practice in different colour mediums and airbrushes – Composition, light and shade drawing.

UNIT IV TYPES OF DRAWINGS 12
Introduction to Chiaroscuro – Principle of perspectives – Linear perspective, Vanishing point perspective – One, two, and three-point perspective – Lines and different strokes using different pencils and brushes – Cartoons, caricature, scale drawing – The practice of birds, animals, and human forms – Portraits and self-portraits.

UNIT V HUMAN AND ANIMAL FORMS 12
The general form and gesture – Drawing from cast & figure light and shade, Basic Proportions, Balance – Standing still or motion – gravity and perspective, shape making – Basic Shapes and procedures – Study of eye, study of nose, study of ear and body – Importance of anatomy in animation.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Complete drawings that work on the basic principles of one and two-point perspective or linear perspective.
- Understand the vocabulary which relates to each of the major elements of art, line, shape, value, colour, and texture.
- Understand the principles of art.
- Grasp the basics of logo designing.
- Gain awareness of the different styles of painting.
- Visualize and start with landscape drawing and painting.

REFERENCES
OBJECTIVES

- To develop skills required for analyzing the usability of a website.
- To understand concept generation and its related field of study.
- To impart the skills required to create an information architecture document needed for a website.
- To explore website and mobile application analysis.
- To establish the requirements for User Experience Concept Designing using techniques such as use cases, personality development and task description.

UNIT I WEBSITE AND MOBILE APPLICATION ANALYSIS 12
The students must select different types of websites and analyze them critically using design principles. The report has to be generated for each of the websites and an analysis of the result should be made. The course delivers an understanding of the important features present on a website. In the same way, the mobile applications are to be chosen in different categories and the results should be summarized. In the end, students learn how to use and implement the design principles in websites and mobile applications.

UNIT II CONCEPT GENERATION & FIELD STUDY 12
Generating a new concept for the project. It can be a product/website/mobile application. After generating the concepts, the students should do the user research (Identifying user research methods, planning for field visits, understanding users, preparing the questionnaire, task list, and designing for users) and prepare the wire-framing based on preliminary research and present it to the course instructor.

UNIT III PERSONA CREATION AND DATA ANALYSIS 12
Creating personas and scenarios, Creating user stories, red routes, and user journey maps, Applying interaction design principles.

UNIT IV DESIGNING INTERFACE AND PROTOTYPING 12
Designing the information architecture – Design for network effects, pattern libraries and social patterns – Designing Interfaces and wireframes, UX prototyping.

UNIT V USABILITY TESTING & EVALUATION 12
The student will do the usability testing/heuristic analysis for the project they have undertaken and after the necessary corrections are made, the final product/website/mobile application will be submitted to the course instructor. The student must use HTML & CSS support for the completion of final product development.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:

- Identify the users and learn the user experience lifecycle in its entirety.
- Develop a deep understanding of business-centred design.
- Create an efficient prototype to communicate and validate the design definition.
- Apply UX process to mobile and small screen devices.
- Develop a prototype.
- Test the usability of the developed design.

SOFTWARE
- Adobe XD, Figma, Adobe Dreamweaver

REFERENCES

MV5113
PHOTOGRAPHY LAB

OBJECTIVES
To create opportunities for professional and creative expression through the art of photography.
• To understand and explore photojournalism.
• To understand the genres of photography
• To study different types of lighting techniques.
• To inculcate students with the aesthetic sense that is involved in creativity.

UNIT I
INTRODUCTION TO PHOTOGRAPHY
12
Students practise using fully manual SLR and DSLR cameras to learn camera focus. They also use semi-manual modes like shutter and aperture priority mode, to practise exposure, Depth of field, and focal length.

UNIT II
COMPOSITION
12
Students practise the use of Monochromes and colours to understand contrast, texture, pattern, shapes, and perspectives. They also learn Framing and Composition with different shots and camera angles in DSLR.

UNIT III
LIGHTING
12
Practising in available light on select themes. Use of different metering modes and manipulation of light to create different moods. Concentrating on assignments based on the use of colours in photography. Use of reflectors and diffusers – Practice in various patterns of lighting for portraits, self-portraits and other genres.

UNIT IV
PHOTO JOURNALISM
12
Covering news events inside the campus based on different news elements to practise for photojournalism.

UNIT V
GENRES OF PHOTOGRAPHY
12
Practice in fully manual and semi-manual modes for capturing sports events and moving objects. Practice in social themes and selected genres of photography like product photography.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Learn the principles of good composition in photography.
• Create new lighting strategies.
• Compose the perfect shot in photography.
• Develop an individual style of representing society through photographs.
• Take photographs covering all the different genres in photography.
• Build their photography portfolio.
REFERENCES

MV5114 AUDIOGRAPHY AND VIDEOGRAPHY LAB

OBJECTIVES
- To gain knowledge on studio equipment usage and its benefits.
- To understand video and audio recording knowledge for various production techniques.
- To inculcate an aesthetic sense in audio and video production.
- To learn about different video and radio programming formats.
- To provide a clear understanding of video and audio studio setups.

UNIT I BASICS OF AUDIO AND VIDEO
Practice with semi-professional video camera, Video switcher, Teleprompter, Audio switcher. Setting up the studio for video and audio production, Practice with camera format settings, Image control settings. Practice with wired and wireless microphones, setting up microphone – Synchronizing, sensitivity, pickup patterns, and audio decibels. Activities related to scriptwriting.

UNIT II HANDLING VIDEO AND AUDIO EQUIPMENT

UNIT III PRACTISING
Practice with types of camera angles – Objective, Subjective and Point-of-view – Assignment to understand bridging time & space – Assignment on audio interview – How to cheat with a location (Chroma Key).

UNIT IV LIGHTING
Lighting setup for indoor and outdoor – Three-point and five-point lighting setup – Practising with various styles of lighting setup – Understanding the concept of colour temperature and how to bounce natural light – Light setup of blue or green screens.

UNIT V MASTERING
Produce programmes for various platforms like social media, television, radio, commercial and corporate videos.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Recognize the principles of production techniques.
- Practice with different types of shots, angles, and compositions.
- Practice with different types of microphones and audio equipment.
- Practice on various genres of production.
- Gain expertise in creating sound effects and live audio recordings.
- Produce socially responsible programmes to create change in society.
SOFTWARE
- Audacity, Adobe Final Cut Pro.

REFERENCES

MV5201  DIGITAL ART  L T P C
2 0 2 3

OBJECTIVES
- To acquire knowledge on various art traditions.
- To learn about the fundamentals and principles of digital art.
- To be familiarized with concepts of colours and perspectives.
- To express ideas in the form of creative digital art.

UNIT I  INTRODUCTION TO ART AND ITS TRADITION  12
Art in our world: Art, the language of art, artists’ creation – Art theory: Imitationalism, formalism, emotionalism, art criticism and aesthetic judgment – Learning from a work of art – Art criticism – Aesthetics – Art history – Reading art like literature – Art traditions from around the world – Art of ancient times – Middle Eastern and Asian art – African Art – Art of the Americas – Architecture – Transitions in Western art – Modern art – Twentieth-century art – New media animation.

UNIT II  DIGITAL MEDIUM  12

UNIT III  ELEMENTS AND PRINCIPLES OF ART  12
UNIT IV  COLOUR AND PERSPECTIVES


UNIT V  TYPES OF DIGITAL ART

Figure-drawing studies of the human form – Face and body proportions – Using digitizer tablets and various graphics software – Landscape on-location sketches – Use of electronic media for final work – Figurative, abstract, landscape, Still-life – Utilize knowledge of composition – Observation of actual objects – Stylus & tablet techniques.

PRACTICALS
1. Create logos with shapes and effects
2. Create different print collaterals using computer graphics tools
   (Visiting card, letter head, brochure, pamphlets, danglers, leaflets, posters, book cover, CD cover, greeting cards and other printing materials, etc.)
3. Product cover design
4. Package cover designing
5. Designing an invitation
6. Editing photographs with effects and colour correction
7. Collage works with photographs
8. Developing graphic backgrounds and layouts
9. Designing 3D buttons, menus
10. Designing a web page
11. Creating and designing newsletter
12. Designing a calendar
13. Designing a print advertisement for newspapers and magazine.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Acquire knowledge of art traditions.
- Understand the fundamentals of digital art.
- Imbibe digital art principles.
- Create and express ideas through various forms of digital art.

REFERENCES
OBJECTIVES

- To understand and get familiarized with the principles and theories of animation.
- To incorporate basic animation techniques and concepts covered in films.
- To understand the scripting language and its uses.
- To produce exercises as well as a final project in animation using Flash software.
- To develop interactive animations.

UNIT I

GRAPHICS AND ANIMATION

Introduction to Computer graphics – Application of computer graphics – coordinate systems – Basic terms: pixel, resolution, screen size, aspect ratio, raster and vector graphics, frame rate, file formats and resolution – Introduction to animation – Animation Techniques – Basic factors affecting the illusion of motion – Introduction to 2D animation software interface: Basic drawing and painting tools – Shading techniques: Working with colours, strokes and fills, drawing for animation based on observation, memory, and imagination, creating and modifying vector objects.

UNIT II

ANIMATION PRINCIPLES AND FORMATS


UNIT III

ANIMATION PRODUCTION AND FILM-MAKING PROCESS


UNIT IV

FILM-MAKING TECHNIQUES OF 2D ANIMATION

Character construction – Expressions: Face, Hand, and other parts of the body – Character design: Personality, attitude, proportion, head height, silhouette – Music and sound effects, Lip sync, – Compositing, rendering, framing, transition, staging and continuity – Crossing the line, background and environment layouts – Distance and perspective – Focus of attention.

UNIT V

INTERACTIVE ANIMATIONS

Action Scripting: variables, data types, statements and expressions – Operators, decisions making statements, looping statements, functions, user interaction, text, styles and fonts, events and event handlers – Interactivity with the mouse and keyboard – Timers and time-driven programming – Multi-touch and accelerometer input – Error handling.

OUTCOMES

At the end of the course, the student will be able to:
- Use design principles and theories to produce animations.
- Plan and execute the production of animation films starting from concept creation to final output.
- Understand the history of animated films and different animation techniques.
- Learn about various film-making techniques.
- Incorporate interactivity using the scripting language.

REFERENCES


MV5203 USER INTERFACE DEVELOPMENT

OBJECTIVES
- To describe the structure of the User Interface and the Design process.
- To develop the Web Interface and to organize the systems and control.
- To understand and create queries using SQL Language.
- To learn about server controls and events in ASP.NET.
- To augment the knowledge on data Access with ADO.NET.

UNIT I INTRODUCTION TO USER INTERFACE DESIGN

UNIT II SCRIPTING LANGUAGE

UNIT III JAVASCRIPT – OBJECTS, ARRAYS, FUNCTIONS & VALIDATIONS

UNIT IV JQUERY
- Introduction to jQuery, Syntax, Selectors, Events, Effects, HTML Traversing, AJAX. Introduction to jQuery mobile, mobile pages, transitions, buttons, icons, popups, toolbars, navbars, panels, Collapsible, tables, grids, lists, forms, themes, events.

UNIT V BOOTSTRAP & ANGULAR JS
- Introduction to Bootstrap, Bootstrap Grids, Themes, Bootstrap CSS, Bootstrap JS, Introduction to Angular JS: AngularJS Expressions, Modules, Data Binding, Scopes, Directives & Events, AngularJS Controllers, Filters, Services, HTTP, Tables, Validation, API, Animations, i18n and i10n.

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Describe the characteristics of Graphic Interface and its principles.
- Discuss the nature of the design process and its relation to other phases of the software development process.
- Efficiently Create, update, retrieve and Manage data using SQL
- Comprehend .NET Framework and Windows Application.
- Connect with backend using ADO.NET.

REFERENCES

MV5204 3D MODELING AND ANIMATION  L  T  P  C
3   0   0   3

OBJECTIVES
- To learn the basics of animation history.
- To understand the topology of the 3D model.
- To learn the basic physical properties of different 3D objects and its environment.
- To understand the various techniques involved in character movements.
- To inculcate editing and texturing skills.

UNIT I UNDERSTANDING 3D

UNIT II 3D MODEL AND TEXTURING

UNIT III RIGGING AND ANIMATION
UNIT IV  PARTICLES  9
Dynamic locator – Cloth – Texture properties – Hair – Follicles and texture – Modify curves –
Region – Motion and kill field – MASH network and editor.

UNIT V  RENDERING  9
Colour theory, Applying Colour theory in model, Adjusting material shaders – Multi-pass render
– Multi-pass layering – Ambient occlusion – 3D paint tools – Beauty pass – Diffuse- Glow –

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Gain an understanding of the basic 3D concepts.
• Understand how digital image works.
• Comprehend the basic movement of a character.
• Texture an object.
• Colour models efficiently by applying colour theory.

REFERENCES

MV5211  2D ANIMATION LAB  L  T  P  C
0  0  4   2

OBJECTIVES
• To appraise the knowledge and skills required to produce 2D animation sequences.
• To get acquainted with the 2D animation software.
• To get familiarized with the principles of mechanics, anatomy, and physics of animation.
• To impart the use of animation software in creating a range of productions.
• To create interactive animations.

UNIT I  INTRODUCTION TO 2D ANIMATION  12
• Create frame-by-frame animations.
• Create cutout animations / Flip books / Stop motion animations.
• Create tween animations – Classic tween, Motion tween and Shape tween.

UNIT II  PRINCIPLES AND STYLES IN ANIMATION  12
• Create animations that include all basic principles like bouncing ball, falling balloon, ball
rolling on wooden ramp/coming to halt.
• Create a character and background design.

UNIT III  MASKING  12
• Produce animations using static mask: text and image masking.
• Produce animations using dynamic mask: text and image masking.
• Produce animations for weighted object lifting, pushing, and pulling.
UNIT IV   ANATOMY IN ANIMATION AND 2D ANIMATION FILM-MAKING  
- Create animations involving anatomy: Character walk, run, pose.
- Animate various facial expressions and include Lip Sync, Sound, Audio effects.
- Create animations using 3D tools and IK bones.

UNIT V   INTERACTIVE ANIMATION AND ITS APPLICATIONS  
- Create animated advertisements.
- Design and develop a web banner.
- Create animated PSAs, mobile applications.
- Action Script: Website.
- Action Script: Quiz / Interactive presentation.
- Animation portfolio.

TOTAL: 60 PERIODS

OUTCOMES  
At the end of the course, the student will be able to:
- Apply principles of mechanics and physics to animation.
- Develop an understanding of the tools used for creating 2D graphics and animation.
- Design 2D graphics, 2D character modeling and animation.
- Identify the fundamental skills acquired by creating and demonstrating an interactive presentation. Create a portfolio that meets industry expectations to showcase their artistic and technical achievements.

SOFTWARE  
- Adobe Animate.

REFERENCES  

MV5212   USER INTERFACE DEVELOPMENT LAB  

OBJECTIVES  
- To develop skills required for analyzing the usability of various platforms  
- To understand the concept of DBMS  
- To understand and create queries using SQL Language  
- To gain the knowledge of Dot Net Frameworks along with ASP.Net and C#  
- To provide insights into the efficient usage of ADO.NET

UNIT I   USER INTERFACE DESIGN ANALYSIS  
- Understanding and designing business with "requirement gathering".
- Designing Structure: Interaction design.
- Designing Structure: Information Architecture.
- Analyzing different types of websites and understanding the design principles of each user interface.

28
UNIT II  JAVASCRIPT
- Validate the website using Javascript objects
- Creating dynamic Calendar, Timestamp and Banner

UNIT III  JAVASCRIPT – OBJECTS, EVENTS
- Programmes related to event handling, Events, and Error handlings
- Programmes related to Window and Document objects.
- Design and Develop a professional interactive and dynamic website

UNIT IV  INTRODUCTION TO J Query
- Programs related to jQuery Selectors, jQuery Events, jQuery Effects, jQuery HTML, jQuery Traversing, jQuery AJAX, jQuery Misc.
- Programs related to jQuery-Mobile Pages, Mobile Transitions, Buttons, Mobile Icons, Mobile Popups, Toolbars, Navbars, Panels, Collapsibles, Tables, Mobile grids, Mobile lists, Mobile forms, Mobile themes, Mobile events.

UNIT V  BOOTSTRAP & ANGULAR JS
1. Programs demonstrating Bootstrap Basics, Bootstrap Grids, Bootstrap Themes, Bootstrap CSS, JS.
2. Programs related to AngularJS Expressions, Modules, Data Binding, Scopes, Directives & Events, Controllers, Filters, AngularJS Services, HTTP, Tables, AngularJS Select, Fetching Data from MySQL, AngularJS Validation, AngularJS API, AngularJS Animations, AngularJS i18n and i10n

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Define the fundamental terms and concepts related to web development
- Design and implement the database system with the fundamental concepts of DBMS.
- Write SQL statements that create database objects.
- Build Web Applications incorporating Controls in ASP. Net and Validating User Input.
- Integrate the developed front end web application with database.

SOFTWARE
- Oracle, Visual Studio

REFERENCES
- jQuery Cookbook: Solutions & Examples for jQuery Developers by Cody Lindley, published by O'Reilly Media Inc. 2010.
OBJECTIVES

- To create a new model with standard primitives.
- To work with different 3D software.
- To understand the fundamentals of texturing.
- To learn the various techniques involved in modeling and texturing.
- To understand the various stages involved in the process of animation.

UNIT I  INTRODUCTION TO 3D

- Creating a basic model without editing standard primitives.
- Creating a model by editing standard primitive objects.
- Using Boolean expressions.
- Creating a Wireframe of a model.
- Sketching the model.
- Understanding the software interface.
- Understanding menu and tear-off menu.
- Working with shelves.
- Using channel box and attribute editor.
- Customizing the layouts.
- Working with tools.
- Working with transform, rotate and scale options.
- Creating a simple object using the standard object.

UNIT II  DEVELOPING 3D MODELS

- Creating a model using extrude, bevel, smooth.
- Creating T-Pose.
- Cleaning of mesh.
- Selecting multiple objects.
- Snapping the object.
- Creating and modifying the standard objects.
- Working with vertex, edge and face.
- Using extrude, bridge, chamfer, and cut face tool.
- Creating arc, line and square.
- Using smooth, curl, and bending curves.
- Creating different objects using the standard objects.
- Working with keyframe animation

UNIT III  INTRODUCTION TO TEXTURING

- Applying standard materials with colour.
- Applying external Image as texture.
- Applying materials and 2D textures.
- Mastering extra map options.
- Layering materials and textures.
- Using 3D textures.
- Using 2D and UV texture projection formats.
- Working with bump, normal, and displacement map.
- Texturing and customization of nodes.
- Working with utilities.
- Using paint effects.

UNIT IV  LIGHTING

- UV editing.
- UV unwrapping.
- Understanding colour.
- Linking and unlinking lights.
- Using depth maps.
• Understanding Raytracing shadows.
• Using 1, 2 and 3 Point lighting.
• Applying different lights for the scene.
• Creating motion for the scene.
• Creating walkthrough for the camera.

UNIT V  FINALISING

12
• HDRI sources.
• Editing texture using the node editor.
• Creating particles for the scene.
• Modifying particles, gravity, push, and other particles.
• Creating human models, birds, and animal characters.
• Placing bones for the character.
• Understanding character weightage.
• Creating motion animation with rigging formats.
• Working with character motion.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Understand the workspace of a 3D software.
• Develop creative 3D models.
• Apply relevant textures to 3D models.
• Apply the image as texture to 3D models.
• Skillfully edit texture using node editor.

SOFTWARE
• Autodesk Maya.

REFERENCES

MV5301  2D GAME DESIGN AND DEVELOPMENT  L  T  P  C
3  0  0  3

OBJECTIVES
• To explore the history of games and the gaming industry.
• To introduce the taxonomy of games.
• To familiarize students with issues, types, and techniques of computer game design.
• To explain the various phases in game development from the ideation stage to final finished game.
• To impart the practical and conceptual knowledge of game development along with the relevant theories behind game technology.

UNIT I  INTRODUCTION TO COMPUTER GAMES  9
UNIT II  
STORY AND GAMES  
9

UNIT III  
GAME DEVELOPMENT PROCESS  
9
Game design, teams and development processes: Game identification, terminology, storyboards, concepts, level design, modeling, interface design, development – Playtesting, planning and creating games: adding enemies, level design and adding basic enemy artificial intelligence.

UNIT IV  
GAME SCRIPTING  
9
Human-computer interaction (HCI) – Computer graphics, collision detection, lighting, and animation – Game scripting and programming – Game data structures and algorithms – Planning and creating games: defending and gaining score, energy.

UNIT V  
GAME DEVELOPMENT WITH ENGINE  
9

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Describe the history of games and gaming industries.
• Describe and differentiate between different types of games.
• Demonstrate an understanding of the overall game design process.
• Design and implement basic levels, models, and scripts for games.
• Design and build their own functional game using game-engine.

REFERENCES

MV5302  
VISUAL EFFECTS  
L T P C
3 0 0 3

OBJECTIVES
• To attain mastery of compositing tools.
• To enhance the video by adding a new set of elements.
• To understand the breakdown of visual effect shots.
• To understand the concept of motion capture and the related technologies.
• To learn different image matching and modeling.
UNIT I  DEVELOPMENT OF VISUAL EFFECTS

UNIT II  ROLE OF PRODUCERS

UNIT III  WORKING WITH EFFECTS
Working with special effects, visual effects and mechanical effects – Alpha channels, advanced selections – Level adjustments, extraction of grunge and grime maps – Steps in gathering light data, scanning properties – Characters and other set materials – Roles of visual effects supervisor, understanding the alpha value, working in stop motion and miniature – Motion capture and technology.

UNIT IV  IMAGE MATCHING

UNIT V  Merging with 3D
Setting up a scene for the camera track and markers – 3D motion tracking – Using tracking markers – Interaxial separation, horizontal image translation, positive and negative parallax – Floating windows, energy and weapons, aesthetic scale – Creating 3D photography, pros and cons of 3D photography – Camera rig, multi-pass render, pixel displacement – 3D conversion, data workflow, real ID mastering – Concept of crowd multiplication, sky replacement – Global illumination and image-based lighting, rigid body dynamics, and rendering.

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:

- Understand visual aesthetics in films.
- Create new visual effects for their productions.
- Explore new technologies in the visual effects industry.
- Work with stereoscopic visual effect shots.
- Understand the role of a visual effects producer.

REFERENCES
OBJECTIVES

- To understand the characteristics and scope of research.
- To explore new research techniques and methods.
- To understand data collection and analysis.
- To learn the statistical techniques required for analysis.
- To understand the processes and methods involved in research evaluation.

UNIT I INTRODUCTION TO RESEARCH METHODOLOGY


UNIT II REVIEW OF LITERATURE

Analysis of review of literature – Primary, secondary and web source – Critical literature review – Identifying gap areas from literature review – Research questions – Research methods.

UNIT III QUANTITATIVE RESEARCH


UNIT IV QUALITATIVE RESEARCH

Qualitative research: Need/aim/scope – Types: Observation, interviews, in-depth interview, focus group discussion – Semiotics – Frame analysis – Visual ethnography (including autophotography and photo elicitation) - Discourse analysis – Cultural studies – Multimodal and multi-sensorial research – Formative Research and Participatory research.

UNIT V REPORT AND EVALUATION

Structure and types of report, technical report and dissertation, style manual, plagiarism – Citation and acknowledgement – Reproducibility and accountability.

TOTAL: 45 PERIODS

OUTCOMES

At the end of the course, the student will be able to:

- Understand the scope of the research.
- Use both quantitative and qualitative research methods.
- Carry out research in the fields of advertising, social media, journalism, communication, etc.
- Apply statistical techniques and tools.
- Write a research report.
- Take up independent researches.

REFERENCES

2. Gerard Guthrie, Basic Research Methods: An Entry to Social Science Research, Sage, New Delhi, 2014.
OBJECTIVES

- To learn the data acquisition, data cleansing, data analytics and visualization techniques
- To learn the method of doing various data analysis techniques
- To understand the various qualitative data analysis techniques
- To understand the importance of statistical models
- To learn social media analysis and other textual analysis formats

UNIT I  INTRODUCTION TO DATA ANALYSIS  12
Description of data – Various types of analytics – Popular analytical tools -- Data presentation
– Creating tables and graphs -- Data visualization -- Infographics.
1. Understanding the importance of primary and secondary data
2. Working with sample primary and secondary data
3. Understanding the interface of statistics software and learning different tools
4. Creating survey form (questionnaire development)
5. Scale development process – Preliminary work
6. Understanding Samples & Population – Finding sample from population
7. Sample size determination
8. Identifying Sample error
9. Sample data collection (Pilot study)
10. Importing primary data
11. Data purification process
12. Understanding and cleaning outliers
13. Classification and tabulation
14. Frequency distribution, graphical representation

UNIT II  DESCRIPTIVE ANALYSIS  12
Understanding the different types of data and its use – Discrete data – Continuous data -- Measure of central tendency – Measures of dispersion – Skewness – Kurtosis.
1. Calculate mean for the given set of data using various methods for discrete and continuous data
2. Calculate weighted arithmetic average, harmonic mean, geometric mean and positional averages
3. Calculate median, quartiles and percentiles for the given data using different methods for discrete and continuous data
4. Calculate mode for the given data for discrete and continuous data
5. Calculate range, co-efficient of range, quartile deviation and co-efficient of quartile deviation, and mean deviation
6. Calculate standard deviation for the given data
7. Calculate variance for the given data
8. Calculate coefficient of variation
9. Calculate coefficient of skewness
10. Measure of Kurtosis

UNIT III  INFERENTIAL ANALYSIS  12
Types of hypotheses – Hypothesis testing — Understanding the importance of p Value – Types of inferential tests – Understanding parametric and non-parametric tests – Anova, t-test, 1 sample t-test, 2 sample t-test -- Goodness of fit, chi-square – Correlational analysis – Regression models, linear regression, multiple regression and logistic regression – Predictive model, split the data, model selection, multi-collinearity, predictions and quality checks -- Principal component analysis, Factor analysis, cluster analysis, discriminant function analysis.
1. Importing data and doing data purification process
2. Understanding when to use what test, and assumptions
3. Data Normality testing using graphical and statistical methods
4. Analysis of Variance (ANOVA)
5. T-test
6. Chi-square test of independence
7. Correlational Analysis
8. Regression analysis (linear, multiple and logistic)
9. Factor analysis & its related tests
10. Cluster analysis
11. Discriminant analysis
12. Running different non-parametric tests

UNIT IV TIME SERIES ANALYSIS AND STATISTICAL MODELS 12
Introduction to Predictive Models – Forecasting – Time Series Analysis – Introduction to various statistical models – Structural Equation Modeling (SEM) – its need and prerequisites
1. Time Series Analysis – Graphical method of measuring trends
2. Measuring trend values – Semi averages method, Moving averages method, Method of least squares
3. Calculating seasonal variation methods.
4. Importing data into the software and preparing it for the model development analysis using various options.
5. Preparing a model based on the theoretical framework
6. Test the model using software (exploratory and confirmatory factor analysis)
7. Reliability and validity testing
8. Using the same set of data and run the model using different software and understand the differences in the results
9. Path analysis.

UNIT V QUALITATIVE DATA ANALYSIS 12
Understanding Qualitative Data – Qualitative Analysis – Managing data, Reading and annotating, creating categories, Splitting and splicing linking data, making connections – Of maps and matrices, Corroborating evidence, producing an account – Introduction to social media research – Analyzing Social Media Content using various software – Retrieving data and doing text analysis, cloud mapping, word art creation, sentiment analysis, network analysis.
1. Understanding qualitative data
2. Understanding the difference between deducting and inducting approach
3. Preparing coding sheets (wherever necessary)
4. Data cleaning and labeling
5. Creating framework for analysis
6. Doing content analysis, narrative analysis and discourse analysis
7. Analyzing structured and unstructured text
8. Analyzing audio and video formats
9. Quality checking using credibility, validity and reliability of content
10. Social Media data analysis (text analysis, cloud mapping, word art, sentiment analysis)
11. Network analysis

TOTAL: 60 PERIODS

SOFTWARE USED
Microsoft Excel, SPSS, AMOS, SMART PLS, R Studio, NVIVO

OUTCOMES
At the end of the course, the student will be able to:
- Perform data acquisition, data cleansing, and various aspects of data analytics and visualization.
- Use the principles of data analytics and its underlying methods and algorithms using various software.
• Do the different descriptive and statistical analysis
• Create scenically working models through statistics.

REFERENCES
1. James, G., Witten, D., Hastie, T., Tibshirani, R. An Introduction to Statistical Learning with Applications in R. Springer, 2013.

MV5312 2D GAMING LAB

OBJECTIVES
• To understand the 2D game design and development process.
• To understand the physics and mechanisms involved in the 2D game development process.
• To understand modeling, techniques, and scripting involved in the 2D game development process.
• To plan and create a 2D game using a game-engine.

UNIT I INTRODUCTION TO 2D GAMES ART
• Preparing a concept document.
• Developing game story, setting and characters.
• Developing key assets for games.
• Creating environment design.

UNIT II GAMEPLAY
• Developing gameplay.
• Design and create a traditional board game.
• Design and create a maze game.
• Design and create a puzzle game.

UNIT III GAME MECHANICS
• Implement the game mechanics (risk, reward, uncertainty, etc.).
• Design and develop an Egg Catcher game.
• Design and develop shooting game.
• Implement the level design.

UNIT IV GAME CONTROLS
• Implement game controls (movement, attack, power-ups, etc.).
• Design and develop platform games.
• Design and develop racing games.
• Design and develop role-playing games.

UNIT V ARTIFICIAL INTELLIGENCE
• Implement strategic decision making for opponent.
• Enemy AI.
• Design, develop and implement AI.
• Publishing for Desktop, Android, and iOS.
• Preparing a game design document.

TOTAL: 60 PERIODS
OUTCOMES
At the end of the course, the student will be able to:
- Create the design of a game.
- Plan and develop the designed game.
- Work with game-engine.
- Design and implement basic levels, models, and scripts for games.
- Design and build fully functional games using game-engine.
- Design and develop different types of games.

SOFTWARE
- Adobe Animate, Unity.

REFERENCES

MV5313 VISUAL EFFECTS LAB

OBJECTIVES
- To understand the pipeline of visual effects.
- To study the new techniques involved in visual effects.
- To understand the working of visual effect shots.

UNIT I INTRODUCTION TO TOOLSET
  - Understanding the UI of software, viewer and metadata.
  - Creating stick nodes and postage stamps.
  - Working with tracking – single, double, four-point tracking – rotation and scaling.
  - Understanding the x-axis and y-axis of footage.
  - Stabilizing the running footage.
  - Match moving the object to the footage and rendering.

UNIT II RETOUCHING MOVING IMAGES
  - Understanding and working with Rotoscopy.
  - Bezier, B-splines, shapes, feather. Compositing with different footage using Roto.
  - Exporting and importing the alpha channel.
  - Retouching with Rotopaint.
  - Working with wire removal shot.
  - Creating and working with a clean plate.
  - Working with graph editors.
  - Understanding and working with the match move process.

UNIT III KEYING AND PARTICLES
  - Working with blue/green matte footage.
  - Using different keyers – IBK colour, Key light, Chroma key, Alpha key; Create a garbage mask.
  - Matching light space and adjusting for brightness and colour.
• Copying channel and working with shuffle channel options.
• Adding noise in the live-action videos, Removing grain and dust.
• Creating and working with titles.
• Adding particles in compositing.
• Creating the digital crowd.
• Grading and colour correction.
• Time warping.
• Working with distorted images and videos.

UNIT IV  3D COMPOSITION
• 3D space in compositing.
• Creating multiple pass render.
• Working with camera tracking.
• Applying camera movement to a footage.
• Creating an external geometry.
• Importing camera data and normalizing it.
• Using HDRI images to light the source.
• Working with keyframes.
• Creating matte paint.
• Creating and merging the set extension objects to live-action.
• Matching lights and shadows.

UNIT V  SCRIPTING AND RENDERING
• Creating a depth map.
• Understanding the Z-depth.
• Compositing stereoscopic 3D.
• Working with particles.
• Creating particle simulation.
• Working with smart vectors.
• Understanding and working with deep compositing.
• Using python script to animate.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Understand the visual appeal in the films.
• Create new visual effects for their production.
• Develop a 3D environment.
• Merge live-action footage with the visual effects.
• Simulate particle items.
• Code Python scripts for visual effect.

SOFTWARE
• Nuke.

REFERENCES
MV5314 INDUSTRIAL PROJECT (SUMMER)  
L T P C  
- - - 2  

The students shall undertake an internship for a minimum of four weeks in any media organization during the summer vacation (after the end semester examination of the second semester) and submit a consolidated report of the work done within a fortnight after the beginning of the third semester. The students will be evaluated based on presentation and oral examination.

MV5411 DISSERTATION  
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OBJECTIVE  
The main objective is to instill research interest in students and allow them to explore the various research techniques of multimedia. The students will carry out research under the guidance of a faculty member and submit a dissertation.

GUIDELINES FOR STUDENTS CHOOSING RESEARCH TOPIC  
The students will be allowed to choose a research topic of their choice under the supervision of a faculty member. The topic should be related to multimedia/media studies. Interdisciplinary studies are allowed only if there is a multimedia/media element in the research topic.

RESEARCH PROJECT REVIEWS  
The students will present before a screening committee to finalize the topic. This is followed by the first review to present their aim, objectives, scope, and need for the study, second review to present their review of literature and methodology, third review to present their findings before the research review panel. The review panel will be constituted by the Project Coordinator with approval of the Head of the Department. The review committee consists of the Supervisor, subject expert and Coordinator.

FINAL VIVA-VOCE EXAMINATION AND DISSERTATION SUBMISSION  
The final evaluation will be an external evaluation, where the students will present their research findings through a presentation and also by submitting a dissertation. The students have to follow the Anna University guidelines for dissertation preparation. The external evaluator will be from another University / College and will be approved by the Head and the Chairperson, Science and Humanities, Anna University. The student's dissertation will be scrutinized for plagiarism. Plagiarized works will not be considered for evaluation. The students are encouraged to present their research findings in conferences or publish their work in national / international journals with approval from their Supervisor.

OUTCOMES  
At the end of the semester, the students will understand the importance of research, the need to employ research techniques and tools, and they will gain confidence to work in a contemporary research area independently under guidance.

TOTAL: 360 PERIODS
OBJECTIVES
- To understand the functions of cinema as an institution for production and distribution of social knowledge and entertainment.
- To expose students to a variety of film styles, narrative conventions, visual styles, genres and analyze the dominant forms of popular cinema.
- To develop a critically informed sense of the history and development of film conventions, both mainstream and alternative.
- To impart knowledge on the historical development and cultural impact of film as an art form.
- To analyse the ideologies on ethics and social justice through representations of culture on film.

UNIT I  INTRODUCTION TO FILMS

UNIT II  FILM THEORIES

UNIT III  WORLD CINEMA
Introduction to world cinema – Film movements from Soviet, France, Germany, Italy, Korean etc. – Hollywood and its history – Convergence and films production, distribution and consumption in digital era.

UNIT IV  INDIAN CINEMA

UNIT V  TAMIL CINEMA
History of Tamil cinema – Cinema as an institution – Cinema as popular culture – Influence of cinema on social, cultural economic, political milieu in India and Tamil Nadu – Understanding audiences – Censorship and regulation of films – Need for media literacy in society.

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Demonstrate a broad knowledge on film history, world cinemas and national cinemas.
- Understand, analyze, and critically evaluate films using various theories for its aesthetic as well as cultural constructs.
- Recognize the social, economic, and technological factors that shape films from different historical periods, ideological perspectives and cultural contexts.
- Apply critical thinking and aesthetic judgment in the analysis of fiction and non-fiction film, experimental and mainstream cinema, feature and short form narratives.
- Demonstrate their understanding of the critical and technical language associated with film studies.
- Understand how films as a cultural force, intersect with religion, politics, race, gender, values, and globalization.
REFERENCES
1. Andrew Dix, Beginning Film Studies, Atlantic Publishers, U.S.A., 2010

UNIT I     INTRODUCTION TO MEDIA MANAGEMENT
9
Media Management – Definition, history, scope. Different types of media and its exclusive features – Print, electronic and digital media. Understanding the different terms of media management – Overview of print, electronic and digital media industry and its role in media management – Understanding the management setups in different media houses – Levels of management function – Management roles – Skills required for various levels of media management team — Functions of media management – Strategies of media management – Ethical aspects to be followed in media management.

UNIT II     MEDIA MARKET PLACE AND THEORIES OF MANAGEMENT
9

UNIT III     HUMAN RESOURCE MANAGEMENT
9
Personnel management – Understanding the importance of human resources in media industry – Strategic human resources framework - Process and working of human resources team, Human resources research – Responsibilities of HR Team – Role of HR management in the development of media industry – Powers of HR in industry – Hiring process of the industry – Interviewing orientation – Performance reviews – Legal issues in personnel management – Power of communication in HR management – Employee welfare and grievances: Working with unions, Understanding labour laws in India, structure, communication strategies and personnel. HR planning, policies, development, evaluation and compensation.
UNIT IV  
**FINANCIAL MANAGEMENT**  

UNIT V  
**PROGRAMMING: STRATEGY AND DISTRIBUTION**  
Broadcast programming, sales, promotion and marketing strategies: Its implication in media business – Print media programming, radio programming, television programming, digital media programming and its challenges – Management issues in programming – Audience research & its importance: Research and analysis, source of audience research data, using audience data, intense competition for audiences, uses of audience research in media management – Media business: regulatory bodies, guidelines, and media ownership in India.

**TOTAL: 45 PERIODS**

**REFERENCES**

MV5003  
**BIG DATA ANALYTICS**  

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**OBJECTIVES**
- To handle and processing Big Data
- To know how and when data can be used to make key decisions
- To learn data processing and create Algorithms
- To introduce the data mining skills.
- To develop student skills on web mining.

UNIT I  
**FUNDAMENTALS OF BIG DATA ANALYSIS**  
Introduction to Big Data and Big Data Analysis, Handling and Processing Big Data, Methodological Challenges and Problems, Example Applications, Big Data Analysis in Practice, Introduction to different big data analytical tools.

UNIT II  
**DATA SCIENCE**  
Introduction to Data Science, Relational Databases and SQL, Data Cleansing and Preparation, Building a Data Model, Data Summarization and Visualization, Association Analysis and Cluster Analysis.

UNIT III  
**DATA MINING**  
Pre-processing Data: Filters, Missing Value, Data Mining, Decision Trees, Classification / Regression Algorithms. Normalization, Distance, Correlations, Machine Learning, Compare Items, Predictive Revenue Model, Class Prediction Model

UNIT IV  
**LANGUAGE R**  
UNIT V WEB MINING

Case Study Session, Preparation of Case Study Report and Presentation and Case Study Presentation.

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:

- Apply the methods of data collection and data analytics to solve business and related problems in support of decision-making.
- Develop the skills necessary to use related software tools to perform data collection, cleansing, and analytics.
- Have deep knowledge about data consumer, recognizing the good and the bad in terms of data collection and applications.
- Understand how leading companies are using analytics.
- Learn about relevant legal and ethical issues.
- Explore the Machine Learning techniques.

REFERENCES

MV5004 EDITING TECHNIQUES

OBJECTIVES

- To appreciate editing as a creative element of storytelling.
- To understand procedures, techniques and standard practices involved in video editing.
- To understand the aesthetic principles and concepts of video editing.
- To understand the processes of mastering the AV for different platforms.
- To understand both aesthetic and technical aspects of post-production.

UNIT I INTRODUCTION TO EDITING

History of editing – Analog or Linear editing techniques, editing workflow – Principles of editing – Roles and responsibilities of editing – Skills required for a successful editor – Elements of an edit – Format and codec, assessing the footage – Selecting the best shots.

UNIT II VISUAL GRAMMAR

Definition of shot, scene, sequence – Five shot rule – Types of edit, transition, treatment of editing, time manipulation within shot & sequence – Cuts to display time – Walter Murch’s criteria to cut, shot-reverse shot – Axial cut, B-roll, cutaway, Insert, Kuleshov effect – Parallel cutting, cross-cutting and dynamic cutting – Temporal editing, and associate editing.

UNIT III EDITING TECHNIQUES

Order of shots – Duration of shots/ ASL, Dimensions of edit, Establishing continuity, Importance of tone, pace and rhythm – How to edit for different film genres – Montage, Colour and culture – 5 common film colour schemes, components in sound design – Stylistic uses of sound.
UNIT IV  INTRODUCTION TO SOFTWARE AND BASIC EDITING  9

UNIT V  GRADING AND MASTERING  9
Colour correction – Effects: Pleasantville effect, censor effect, ken burns, draw mask, ramping – Export and sharing, finishing, mastering and delivery – Preparation for various medium distribution techniques behind it.

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Know the workflow of the post-production process in various fields.
• Produce various projects using different editing styles and layouts.
• Produce professional-quality video projects for various platforms.
• Produce videos without any copyright issues.
• Inspire the audience with their skillful editing techniques.
• Work in various visual production industries.

REFERENCES
1. Alexis Van Hurkman, Colour Correction Look Book: Creative, 2013

MV5005  ADVANCED ILLUSTRATION  L T P C
3 0 0 3

OBJECTIVES
• To acquire knowledge on the fundamentals of illustration.
• To understand the principles of illustration.
• To understand the steps involved in creating an illustration.
• To acquire knowledge on various illustration styles.
• To express ideas in the form of illustrations.

UNIT I  UNDERSTANDING ILLUSTRATION  9

UNIT II  PRINCIPLES OF ILLUSTRATION  9
Principles of illustration – Balance, contrast, emphasis, proportion, hierarchy, repetition, rhythm, pattern, white space, movement, variety and unity – Illustration composition principles – Design focus, leading lines, aligning, layout grids – Colour mode, colour theory, colour wheel, warm and cool colours, colour harmony, rule of the thirds, rule of odds – Working with shapes and objects – Working with colours, gradients, pattern fills, blends, points and paths.
UNIT III  
ILLUSTRATION PROCESS  
Illustration process – Concept, inspiration, sketch – Colour scheme, building shapes, embrace feedback, finalize details – Tracing a hand-drawn sketch – Converting to illustration – Working with the type tool – Grouped vectors and compounding vector shapes.

UNIT IV  
ILLUSTRATION STYLES  

UNIT V  
CREATIVE ILLUSTRATIONS  
Illustration types – Corporate illustrations, Advertising illustrations, Publication illustrations, Packaging illustrations – UI design, Environmental illustrations, Information illustrations – Professionalism in illustration and Perspectives for illustration.

OUTCOMES
At the end of the course, the student will be able to:

- Understand the fundamentals of illustration.
- Learn the principles of illustration.
- Know the steps involved in creating an illustration.
- Gain knowledge of various illustration styles.
- Acquire the skills required to create illustrations.
- Express their ideas in the form of a creative illustration.

REFERENCES

MV5006 LIGHTING AND RENDERING

OBJECTIVES
- To introduce the basics of lighting in 3D.
- To create photorealistic still imagery.
- To impart knowledge on lighting and rendering techniques.
- To introduce virtual lighting technologies and tools necessary to create photorealistic imagery.
- To inculcate enhanced techniques for lighting the scene.

UNIT I  LIGHTING THE 3D MODEL USING BASIC LIGHTING  
Preview lights and to choose its colours– Point light and its properties – Direction light and its properties – Spotlight, penumbra angle, Barn doors and its settings – Area light and its implementation in a real-time environment.

UNIT II  LIGHTING TECHNIQUES AND MENTAL RAY RENDERING  
Software lighting techniques – Light intensity and digital colours– Light linking & object linking – Introduction about mental ray nodes – Interior scene lighting using mental ray-1 – Interior scene lighting using mental ray-2
UNIT III   PRODUCT LIGHTING & ENVIRONMENT LIGHTING
Three-point lighting technique – Lighting a product using three-point lighting techniques – Photons and caustics lighting methods – global illumination and final gathering.

UNIT IV   ADVANCED RENDERING MATERIALS

UNIT V   EXTERIOR AND IBL RENDERING

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Learn the basic concepts of lighting in 3D.
- Gain awareness of the physical and virtual technology of lighting.
- Understand the interaction of lights with a 3D surface.
- Use advanced rendering materials.
- Incorporate lighting on a live reference.

REFERENCES

MV5007   HUMAN-CENTRED INTERACTION DESIGN

OBJECTIVES
- To acquire knowledge on the fundamentals of Human-Centred Interaction Design.
- To understand the step-by-step process involved in the development of Human-Centred Design.
- To impart knowledge on the field of Interactive Experience Designing in media, products and computer application designs.
- To help students develop good analytical abilities to gain knowledge of specific techniques and to develop creative solutions.
- To sensitize students about the needs of Indian users and the Indian industry.

UNIT I   INTRODUCTION TO DESIGN
Historical evolution of the field – Interactive system design (theory and practice) – Concept of usability – definition and elaboration – HCI and software engineering – GUI design and aesthetics – Prototyping techniques.

UNIT II   MODEL-BASED DESIGN AND EVALUATION
UNIT III  
EMPIRICAL RESEARCH METHODS  
12
Motivation – issues – research question formulation techniques – Experiment design and data analysis – Task modeling and analysis – Hierarchical task analysis (HTA) – Engineering task models and Concur Task Tree (CTT).

UNIT IV  
DIALOG DESIGN  
12
Introduction to formalism in dialog design – design using Finite State Machines – State charts and Petri Nets in dialog design – Cognitive architecture – Introduction to CA, CA types, the relevance of CA in IS design – Model Human Processor (MHP) – Object-Oriented Programming.

UNIT V  
IMPLEMENTATION AND EVALUATION  
12

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Understand the basic concepts in human-computer interaction.
- Understand the process involved in the development of a human-centred design.
- Comprehend the importance of design principles and the evaluation methods for user interfaces.
- Develop creative solutions through good analytical abilities.
- Devise creative solutions for issues and needs of Indian users and the Indian industry.

REFERENCES

MV5008  
GAME PSYCHOLOGY  
L T P C
2 0 2 3

OBJECTIVES
- To understand the fundamentals of game psychology.
- To introduce social psychology theories and concepts for a better understanding of how people perceive, think and feel about the social world through the game.
- To understand the influence of gaming technologies on human behaviour, culture and society.
- To understand the mind of the gamer.
- To understand the psychology of the gaming world.

UNIT I  
INTRODUCTION TO GAME PSYCHOLOGY  
12
Definitions – Foundations of game psychology – Positive psychology approach, pro-social & antisocial behavior learning through the game – Stereotyping, prejudice, and discrimination: causes, effects, and cures – Global gaming industry: game effects on society, individuals and cultures.
UNIT II  GAME AND GAMER PERCEPTION  12
Learning social life lessons through the game – Understanding human values, Social representations, social norms, social cognition – Gamer attitude among people – Game psychology – History and development of the game and its engine – Game as an industry for earning.

UNIT III  GAME INFLUENCE ON BEHAVIOUR & RELATIONSHIPS  12

UNIT IV  SOCIAL INFLUENCE  12
Approaches – Prejudice, stigma, reducing intergroup conflict, aggression, attraction, altruism, application, propaganda and persuasion – The fine art of persuasion – Social Influence – Conformity – Bystander intervention through the game, learning of obedience to authority – Social facilitation – Social Status – Social roles – Social conformity, Interpersonal attraction, Behavioural influences on attitudes – Attitude formation – Cognitive dissonance.

UNIT V  GAME WORLD  12
Understanding psychology & internet – Psychological issues in addressing through playing online games – Interactive & emerging technologies, social influence in the virtual world – Social connection & social capital, personal media – Mobile, progress and future scope.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Apply the appropriate psychological theory.
• Analyze the complex gaming environment.
• Develop skills towards all generalizations about game psychology.
• Develop critical thinking attitude.
• Evaluate game messages based on evidence.

REFERENCES

MV5009  CHARACTER DESIGNING  L T P C 2 0 2 3

OBJECTIVES
• To learn basic anatomy of a character.
• To apply basic properties of physics to the scene.
• To create a character walk cycle.
• To work with poly to develop the characters.
• To create motion for a character.
UNIT I  3D SURROUNDINGS  12

UNIT II  CHARACTERS  12
Construction of animal character – Pantomime horse construction, Cartoon four-legged construction, four types of animal locomotion – walking, trotting, cantering and galloping, walk cycle or run cycle.

UNIT III  HUMAN ANATOMY  12

UNIT IV  PHYSICS IN 3D  12
Emotions – Eight basic efforts: pressing, flicking, wringing, dabbing, slashing, gilding, thrusting, floating – Body language – body postures, basic modes, palm, hand-arm and leg gestures.

UNIT V  EMOTION FOR THE CHARACTER  12

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Understand different principles involved in character animation.
• Understand human anatomy in character animation.
• Design the characters sketched by them.
• Animate their characters.
• Create animatics.
• Independently create characters for the animation movie.

REFERENCES

MV5010  PROGRAMMING FOR GAMING  L T P C
2 0 2 3

OBJECTIVES
• To understand the concepts of Game design and development.
• To learn the processes, mechanics and issues in Game Design.
• To understand the concepts of Game programming.
• To know about Game programming platforms, frameworks and engines.
• To enable students develop games.
UNIT I  3D GRAPHICS FOR GAME PROGRAMMING  12

UNIT II  GAME ENGINE DESIGN  12

UNIT III  GAME PROGRAMMING  12
Application layer – Game logic, Game views – Managing memory – Controlling the main loop, loading and caching game data – User Interface management – Game event management.

UNIT IV  GAMING PLATFORMS AND FRAMEWORKS  12
2D and 3D Game development using Flash, DirectX, Java, Python, Game engines – Unity – DX Studio.

UNIT V  GAME DEVELOPMENT  12
Developing 2D and 3D interactive games using DirectX or Python – Isometric and tile-based games – Puzzle games, Single player games, Multi-player games.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Understand the concepts of game design and development.
- Design the game and use mechanics for game development.
- Explain the core architecture of the game's programming.
- Use game programming platforms, frameworks and engines.
- Create interactive games.

REFERENCES

MV5011  IMAGE PROCESSING  L T P C
2 0 2 3

OBJECTIVES
- To identify the users and learn various methods to collect user behavior data.
- To develop a deep understanding of business-centred design.
- To create efficient prototype to communicate and validate the design definition.
- To apply UX process to web, mobile & small screen device.

UNIT I  INTRODUCTION TO IMAGE PROCESSING  12
Image Representation and Image Processing Paradigm - Elements of digital image processing – Image model – Sampling and quantization – Relationships between pixels – Connectivity, Distance Measures between pixels – Colour image (overview, various colour models) – Various image formats bmp, jpeg, tiff, png, gif, etc.
UNIT II  DIGITAL IMAGE – OPERATIONS & IMAGE ENHANCEMENT  12

UNIT III  DIGITAL IMAGE RESTORATION & FEATURE EXTRACTION  12

UNIT IV  IMAGE SEGMENTATION  12

UNIT V  IMAGE CODING & COMPRESSION  12

TOTAL: 60 PERIODS

OUTCOMES
At the end of this course, students will understand/learn/develop:
- The basics of image processing concepts, image transforms and image enhancement techniques involved
- Demonstrate image restoration process and experiment the various image segmentation and morphological operations for a meaningful partition of objects
- Design the various basic feature extraction and selection procedures
- the various image compression techniques and their applications and analyze and implement image processing algorithms for various real-time applications

REFERENCES
OBJECTIVES
- To understand instructional systems design and processes for effective instruction.
- To establish a learning environment that fosters positive learning experiences.
- To apply the communication techniques and instructional strategies for varied teaching and learning contexts.
- To promote technology-enabled teaching learning experiences.

UNIT I INSTRUCTIONAL SYSTEMS DESIGN
12

UNIT II MODELS OF INSTRUCTIONAL DESIGN
12

UNIT III TEACHING-LEARNING STRATEGIES
12

UNIT IV EVALUATION OF INSTRUCTIONAL SYSTEMS
12
Components of the instructional package — Selecting existing instructional materials — The designer’s role in material development and instructional delivery — Developing instructional materials — Formative evaluation — Rough draft materials — Human-computer interaction — Validation of instructional material — Outcome-based education (OBE) assessment — Printed materials, still pictures, and graphics — One-to-one evaluation with learners — Small-group evaluation — Field trials — Educational Decisions Model (CIPP Model).

UNIT V DIGITAL TECHNOLOGIES FOR CONTENT DELIVERY
12
Introduction to Learning Management Systems — Web technologies for content delivery — Open educational resources — The learner and the intelligent tutoring systems — Research methods in instructional technology — Educational game design — Learning analytics — Educational data mining Strategies — Delivery and management — Production — The future of ISD — Instructional design and technology — Metacognition in instructional design.

OUTCOMES
- To provide rationales for using a systematic approach to instructional design.
- To identify and summarize the steps and methods of the instructional design process.
- To function independently and cooperatively in teamwork.
- To compare and contrast various instructional design perspectives.
- To apply LMS and web technologies for online learning.
REFERENCES

MV5013 DEEP LEARNING

OBJECTIVES
- To present theoretical foundations, algorithms, methodologies, and applications of neural networks and deep Learning.
- To train and test application-specific deep learning models and to provide the practical knowledge
- To apply the deep learning models in various real-world applications

UNIT I BASIC CONCEPTS OF DEEP LEARNING

UNIT II DEEP LEARNING IN IMAGE PROCESSING AND COMPUTER VISION
How deep learning can be applied in media and technology? -- Introduction to computer vision -- Introduction to Tensorflow and keras -- Computer vision and their real-life applications -- Scope of computer vision -- Generating alternative texts using computer vision [applied examples with Facebook & Instagram.

UNIT III DEEP LEARNING IN TEXT & SPEECH ANALYSIS
Basic linguistics and terms – Language analysis – Natural Language Processing (NLP) projects: characteristics, planning, and other factors -- Sentiment Analysis -- Topic Modelling -- Visualization of speech data -- Transformations in speech data -- Applications based on speech data.

UNIT IV APPLICATION OF DEEP LEARNING IN MASS MEDIA ENVIRONMENT
Deep learning and their applications in digital marketing -- Processing and manipulating structured and unstructured data -- Working with social media data -- Caches and cookies -- Introduction to AI-based recommendation systems -- Implementation of AI-based recommendation systems -- Working with Netflix metrics.

UNIT V DEEP LEARNING FOR BUSINESS ANALYTICS
Deep learning to evaluate TRP metrics and content performance -- Predicting content scope with regression models -- Analyzing product performance by processing user reviews -- Building predictive models with text data as an input.

TOTAL: 60 PERIODS
OUTCOMES
At the end of the course, the student will be able to:

• Understand different methodologies to create application
• Recognize the characteristics of deep learning models that are useful to solve real-world problems
• Identify and apply appropriate algorithms
• Design and implement different deep learning algorithms
• Develop various models for real world problems solving and encoding the original data and reconstruct data.

REFERENCES

MV5014 ADVANCED COMPOSITING TECHNIQUES

OBJECTIVES

• To understand the pipeline of visual effects.
• To study the new techniques involved in Compositing.
• To understand the working of visual effect shots.
• To instill knowledge about colour correction.
• To make students work with particles.

UNIT I BASIC VISUAL ELEMENTS
To understand the UI of software, viewer, metadata, creating stick nodes, postage stamps, working with tracking – single, double, four-point tracking – rotation and scaling. To understand the x and y-axis of footage and to stabilize running footage. Match move an object to the footage and rendering.

UNIT II INTRODUCTION TO ROTOSCOPING
To understand and work with rotostaking, Bezier, B – Splines, shapes, feather – Compositing with different footage using roto – Exporting and importing the alpha channel – Retouching with the Rotopaint – Working with wire removal shots – Creating and working with a clean plate, Working with Graph editors – Understanding and working with the match move process.

UNIT III MATTE AND COLOUR CORRECTION
Working with blue/green matte footage, Using different keyers, IBK colour, Key light, Chroma key, Alpha key – Creating a garbage mask – Matching light space and adjusting for brightness and colour, Copying channel and working with shuffle channel options – Adding noise in the live-action videos, Removing grain and dust – Creating and working with titles, Particles in compositing, Creating the digital crowd, Colour correction and Grading the footage – Time warping, Understanding and working with distorted images and videos.

UNIT IV WORKING WITH 3D
Working with 3D space in compositing – Creating the multiple pass render – Working with camera tracking – Applying the camera movement to footage – Creating an external geometry – Importing camera data and normalize it – Using HDRI images to light the source – Working with keyframe – Creating a Matte paint – Creating and merging the set extensions object to live-action – Obtaining the clean plate from the footage – Merging the multi-pass render to a single output – Matching the Lights and shadows.
UNIT V  ADDING ELEMENTS
Creating the depth map – Understanding the Z-Depth – Composite stereoscopic 3D – Working with particles, creating particle simulation – Working with Smart vectors – Understanding and working with deep compositing – Animating using python script.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
- Understand the visual treat in the films.
- Create new visual effects for their production.
- Develop the 3D Environment.
- Merge the live-action footage with visual effects.
- Simulate particle items.

REFERENCES

MV5015  MOTION GRAPHICS  L  T  P  C
2  0  2  3

OBJECTIVES
- To become visually literate and competent with the non-verbal languages of art and design.
- To develop visual, verbal and written responses to visual phenomena. To develop perception and create conceptualizations both rationally and intuitively.
- To learn the basic principles of storyboarding and project mapping.
- To learn the concept of tracking.
- To understand the usage of 3D in live-action.

UNIT I  INTRODUCTION TO GRAPHICS
General principles of Motion Graphics – Different software used for motion graphics, Photoshop, Final cut pro, Premier Pro, After Effects, Combustion, Nuke – Creating a Pipeline for production – Exercises for different software – Creating a storyboard.

UNIT II  KEYING, ROTO AND TRACKING

UNIT III  GRADING
UNIT IV  3D GRAPHICS  12
Camera tracking in different software – Combining of graphics elements into live-action – Creating and modifying 3D objects, importing 3D materials to various software – Creating a 3D title.

UNIT V  AUDIO  12
Understanding audio properties – Working with different levels of audio – Different types of audio formats – Working with multi-track audio – Rendering the final mix-down audio – Lip syncing with the visual – Exporting the final output.

OUTCOMES
At the end of the course, the student will be able to:
- Shoot graphic videos on their own.
- Understand the concept of grading.
- Assemble the green /blue screen footage.
- Work with 3D environment digitally.
- Work with audio.
- Understand the concept of rendering.

REFERENCES

MV5016  3D GAME DEVELOPMENT  L T P C
2 0 2 3

OBJECTIVES
- To understand the 3D game design process.
- To understand the 3D game development process.
- To understand the physics and mechanisms involved in the 3D game development process.
- To inculcate the knowledge of effective programming in gaming.
- To understand the various concepts of Game Engineering.

UNIT I  INTRODUCTION TO GAME ENGINEERING  12

UNIT II  UNDERSTANDING 3D GAME ENGINE  12
Creating and destroying game objects – Access the components – Events for game objects – Dealing with vector variables and timing variables – Physics oriented events – Coroutine and return types – Physics components: coordinates, vectors, rigid bodies and forces – Colliders and collisions. Creating ticker-taker game - Understand and implement the law of physics. Create ball and hitter - Add light - Add physics to the game - Create a MouseFollow script.
UNIT III  INTRODUCTION TO C# SCRIPT  12
Introduction to C# – Scripts as behaviour components – Data types – Variable and functions – Conditional statements – Loops, classes, instantiate, scope and access modifiers – Arrays – Invoke and enumerations – Awake and start – Update and fixed update – Vector math – Activating game objects – Linear interpolation – Events – Event handlers – Delta time – Creating scenes-based games -- Create a Robot Repair game -- Set up two scenes -- Create GUI -- Create button UI control -- Build the card flipping function -- Prepare the clock script.

UNIT IV  GAME BEHAVIOUR  12

UNIT V  BUILDING AND SHARING 3D GAME  12
Introduction to 3D Canvas – Adding and Updating UI Elements to Game Canvas – Adding Sound Effects to Game – Building settings – Adapting for Web build – Texture compression and debug stripping – Quality settings – Player input settings – Sharing the game – Testing and finalizing -- Create a shoot the moon game -- Duplicate the game project -- Add and tweak the character. Add two cameras and lights-- Setup camera rig -- Animate the bouncer-- Animate the runner -- Deploy the game.

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Understand the concept of game development.
• Implement the concept of programming in Gaming.
• Demonstrate using a game engine to create 3D games.
• Use the skills to write C# scripting language to give actions to game objects.
• Implement different gameplay elements.

REFERENCES

MV5017  VIRTUAL AND AUGMENTED REALITY DEVELOPMENT  L T P C
2 0 2 3

OBJECTIVES
• To explore both history of virtual reality (VR).
• To explore the physiology and perception involved in VR.
• To impart the practical and conceptual knowledge on VR development as well as to divulge relevant theory behind VR technologies.
• To familiarize students with tracking and simulation processes involved in VR.
• To get familiarize with modeling objects and rendering them to make VR
UNIT I  INTRODUCTION TO VR AND AR

UNIT II  VISUAL PHYSIOLOGY AND PERCEPTION
Parts of the human eye, photoreceptors and densities, scotopic and photopic vision, display resolution requirements, eye movements, neural vision structures, sufficient display resolution, other implications of physiology on VR – Photoreceptors – Sufficient resolution for VR, Light intensity, Eye movements, Neuroscience of vision – Depth perception, Motion perception, Frame rates and displays.

UNIT III  TRACKING
Overview, Orientation tracking, Tilt drift correction, Yaw drift correction – Tracking with a camera, Perspective n-point problem, Filtering, Lighthouse approach – Velocities, acceleration, vestibular system, virtual world physics, simulation, collision detection, Avatar motion.

UNIT IV  RENDERING

UNIT V  AUDIO AND INTERFACES
Audio: Physics and physiology, Auditory perception, Auditory localization, Rendering, Spatialization and display, Combining other senses – Interfaces: Locomotion, Manipulation, System control, Social interaction – Evaluation of VR systems/

TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to
- Describe the history of VR.
- Describe the physiology and perception involved in VR.
- Demonstrate an understanding of the theory behind VR technologies
- Demonstrate an understanding of tracking and simulation processes involved in VR.
- Design models and render them to make VR
- Develop interface and sounds to create VR environment.

REFERENCES

MV5018  MOBILE GAMING

OBJECTIVES
- To understand the history and development of mobile games.
- To introduce the android mobile interface.
- To test several games in a mobile environment.
- To develop a user-friendly game in a mobile environment.
- To understand the best practices in mobile game development.
UNIT I  INTRODUCTION TO MOBILE GAMING  12

UNIT II  DESIGNING GAME  12
Generic UI Development – Android interface working – Intents on UIs, VUIs and mobile apps – Characteristics of mobile applications – Storing and retrieving data – Getting the model right – Working with a content provider.

UNIT III  DEVELOPING GAME  12
Android networking and web – Deciding scope of an app – Wireless connectivity and mobile apps – Notifications and alarms – Performance and multithreading – Android graphics and multimedia – Mobility and location-based services.

UNIT IV  TESTING GAME  12

UNIT V  PACKAGING AND DEPLOYING  12
Performance best practices – Android field service app – Active transactions – Mobile app development hurdles – Rendering – Deploying and hosting in server. TOTAL: 60 PERIODS

OUTCOMES
At the end of the course, the student will be able to:
• Create a game prototype that mimics the mechanics and "game already exist".
• Create an original game prototype.
• Evaluate existing game technologies.
• Deploy their prototype in the testing environment.
• Recreate industry’s best practices.

REFERENCES

MV5019  SENSOR-BASED DATA COLLECTION AND MANAGEMENT  L T P C  2 0 2 3

OBJECTIVES:
• To impart the fundamental aspects and principles of sensor technologies.
• To know the internals of the hardware and software components involved in the development of sensor enabled applications.
• To learn about the sensor processing units and their architectures.
• To gain knowledge about sensor application development.
• To evaluate the sensor-based applications.
UNIT I  INTRODUCTION TO SENSORS  12
Introduction to Sensors – Definition – Transduction principles – Anatomy of sensors –
Interdisciplinary strategy – Sensor technology drivers – Trends in sensor development–
Planning sensor technology research.

UNIT II  SENSORS TYPES  12
IR sensors – Ultrasonic sensor -- Temperatures, humidity, proximity, moisture, LDR, Touch,
PIR- Application development using sensor.

UNIT III  SENSORS IN AR:VR  12
System structure of augmented reality – Key technology in AR – 3D vision –Approaches to
augmented reality – Alternative interface paradigms – Spatial AR – Input devices – 3D position
trackers – Performance parameters – Types of trackers – Navigation and manipulation
interfaces – Gesture interfaces – Types of gesture input devices – Output devices – Graphics
display – Human visual system – Personal graphics displays – Large volume displays – Sound
displays – Human auditory system - Holographic video.

UNIT IV  PERSONAL GADGETS SENSORS  12
Mobile phone sensors, Laptop, Internet of Things (IoT) – Applications of sensor-based Smart

UNIT V  CASE STUDIES  12
Medical Applications – Education, arts and entertainment – Military applications – Emerging
applications – Applications in manufacturing – Applications in robotics – Information
visualization –Wearable computing – Games.

TOTAL: 60 PERIODS

OUTCOMES
On completion of the course, the student will be able to:
1. Discuss the basic concepts of Sensors.
2. Design and develop the sensor based applications in different domains.
3. Design various models using sensors
4. Perform sensor programming with toolkits.
5. Understand the working principles of real time components that uses sensors.
6. Evaluate sensor-based applications.

REFERENCES
   2006.
2. Charles Palmer, John Williamson, Virtual Reality Blueprints: Create Compelling VR
   Experiences for Mobile, Packt Publisher, 2018.

OPEN ELECTIVE COURSES (OEC)

MP5491  NUCLEAR ENERGY IN HEALTH CARE AND INDUSTRY  L T P C
        3 0 0 3

OBJECTIVES
- To provide the student about the action of radiation on living cells and the response.
- To make the student to understand the basic nuclear medicine physics and newer
technology systems.
- To enable the students to understand the diagnostic and therapeutic nuclear medicine
  techniques.
- To provide a broad knowledge in radiation hazard evaluation and control
UNIT I  BASICS OF NUCLEAR SCIENCE AND RADIATION EFFECTS  9
Radioactivity, nuclear reactions and interaction of ionizing radiation with matter, with emphasis on radiation detection, radiation shielding - photoelectric - Compton effect and pair production - biological effects on human health - Action of radiation on living cells - direct and indirect physical damage - Cell response to radiation - somatic and genetic radiation effects - Radiation side effects - Acute and chronic effects of low dose effects.

UNIT II  DIAGNOSTIC APPLICATIONS OF NUCLEAR ENERGY  9
Production of X rays and its applications X-ray radiography - CT scan - contrast studies in x ray imaging - fluoroscopic applications - Mammography - physics of nuclear medicine and nuclear imaging - radio isotopes in diagnosis of nuclear imaging - Tc-99m extraction - radiopharmaceuticals - scanning instruments and techniques.

UNIT III  THERAPEUTIC APPLICATION OF NUCLEAR ENERGY  9
Production of nuclear radiations - alpha, beta and gamma rays and X-rays - External radiation therapy - telecobalt unit and linear accelerators - and internal radiation therapy - Iridium -192 HDR brachy therapy unit - Therapeutic nuclear medicine.

UNIT IV  INDUSTRIAL APPLICATIONS OF NUCLEAR ENERGY  9
Industrial applications — Non-destructive testing - industrial radiography - tracing, gauging, Radiation sterilization of medical equipment - food preservation and other applications.

UNIT V  NUCLEAR RADIATION SAFETY MEASURES  9

TOTAL: 45 PERIODS

OUTCOMES
After successful completion of the course
- Students will be able to handle radioactive source carefully for treatment purpose.
- will develop competence in radioactive waste disposal management
- Will be develop competency to face radiation emergency
- Students will develop critical thinking skills in radiation safety and protection.
- Will be able to safe guard the radioactive sources used in hospitals.

REFERENCES

MP5492  SMART MATERIALS FOR ENERGY AND ENVIRONMENT APPLICATIONS  L T P C
3 0 0 3

OBJECTIVES
- To provide fundamental understanding on smart and intelligent materials.
- To enhance students’ understanding on the structure-property relationship.
- To enable students appreciate novel materials and their usage in current cutting edge technologies.
UNIT I  BASICS OF SMART MATERIALS AND STRUCTURES  9

UNIT II  INTELLIGENT MATERIALS FOR ENERGY GENERATION  9
Artificial Intelligence in Materials, Ferroelectricity: Introduction - Piezoelectric effect, Piezoelectric materials as sensors, Actuators and bimorphs - Transparent Conducting Materials – Band-gap and electrical conductivity, Conditions for transparency – role of defects on conductivity - Applications: Solar cells, Touch screen, etc.

UNIT III  SHAPE MEMORY MATERIALS FOR ENERGY STORAGE  9
Introduction to structure types, Structure-property relationships, Shape memory effect (SME), One way and two-way SME, Shape memory alloys (SMAs), Intelligence in the form of SMA, Functional properties of SMAs. Thermal-storage, and aerospace materials. Shape-memory polymers, and their applications.

UNIT IV  MULTIFERROIC MATERIALS FOR NOVEL REFRIGERATION  9
Ferromagnetism and ferroelasticity, Magneto-electric materials: Types of magnetic ordering phenomena, Conditions for multiferroicity – Applications of multiferroic materials. Magnetostrictive smart materials – Magneto-caloric materials for emission-less refrigeration - Magneto-Optic (MO) Materials: Examples (Heusler alloys, double perovskites) and applications.

UNIT V  INTELLIGENT OPTICAL MATERIALS FOR ENVIRONMENT  9

TOTAL: 45 PERIODS

OUTCOMES
- The student will understand the working principle of smart materials
- The student will get an overview on various types of smart materials and their application areas.
- The student will get ideas to use smart materials in green energy and environment applications
- The student will get motivated to find novel applications of these multifunctional materials in new technologies.
- The student will get an idea on different synthesis and characterization techniques

REFERENCES
OBJECTIVES
- To offer a comprehensive approach to reporting climate change.
- To impart knowledge about political, economic, and ethical questions raised by the need for transformative change of societies in the wake of climate change.
- To reflect on the development of climate change as an issue of nature and society.
- To synthesize knowledge from different areas related to climate change.
- To reflect on the norms and values of journalism in the context of climate change.

UNIT I  HUMAN INFLUENCES
- Anthropocene Era (anthropo: man, and cene: new) - Freshwater scarcity - The decline of our oceans, fish, and wildlife - Environmental health - Sustainable energy, agriculture, and food systems – Role and responsibility of journalists – Making climate change relevant as a society issue – Politics and economics of climate change – Environmental ethics – Human health – Species migration.

UNIT II  PUBLIC NARRATIVES
- Complex science and uncertainty - Public apathy and politics - Well-funded counter-narratives - Zealous stakeholders - What can (incorrectly) appear due to a lack of news hook for stories - Two centuries of CO2 emissions.

UNIT III  JOURNALISTIC CHALLENGES
- Environmental Journalism as a craft - Roles and differences between journalism and communications – Finding the most accurate, credible and timeliest information on science and issues – Essentials of environmental reporting – Discerning uncompromised expert sources – Using human narratives and descriptive storytelling to relate real-world impact – Tapping the databases, records and other tools commonly used by environmental reporters.

UNIT IV  CLIMATE ISSUES
- The lack of diversity in environmental journalism – “Junk science” – Battling climate denial - Covering GMOs – The problem of doomsday climate reporting – Digital security for journalists and researchers etc.

UNIT V  JOURNALISTIC SKILLS
- Hands-on journalistic series – Reporting, developing, funding, crafting and publishing environmental stories – Writing diverse stories on environmental history, a wildlife or ocean story, a clam-aquaculture story, a work of nature writing, etc. – A polished, fact-checked, final story with questions answered and edits made from the first draft and at least two added elements such as photos, audio or video clips, graphics, timelines or others to draw people in.

TOTAL: 45 PERIODS

OUTCOMES
- Students will understand the importance of climate issues.
- Students will understand the various aspects of climate change and its effect in society.
- Students will learn to cover the climate change issues.
- Students will understand the need of journalistic skills for covering climate issues.
- Students will learn the various strategies, approaches on covering climate issues in various media.

REFERENCES

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OBJECTIVES
- To create opportunities for professional and creative expression through the practice and art of photography.
- To inculcate aesthetic sense involved in creativity.
- To get to know the genres of photography

UNIT I CAMERA

UNIT II LENS AND ELEMENTS OF PHOTOGRAPHY
Different type of Lenses - Basic Shots and Camera Angles, Photographic Composition - View point and Camera angle-Eye Level, Low and High, Balance- Aspects of Balancing, Shapes and Lines, Pattern, Volume, Lighting, Texture, Tone, Contrast- and Colour, Framing, various Perspectives.

UNIT III COLOUR AND LIGHTING
Colour Theory, Colour Temperature, Electromagnetic spectrum, Lighting Philosophies – Basic styles of Lighting – Properties of Light – Additive and Subtractive Light – Contrast and Lighting Ratios – Direct and Indirect Light – Three point and Five Point Lighting – Light Sources. Light meters and filters

UNIT IV PEOPLE AND PORTRAIT PHOTOGRAPHY
Indoor and outdoor lighting techniques for portraits, the Casual Portrait, Environmental Portraits, Group Portraits, Familiar Subjects, Hands and Other Details.

UNIT V GENRES OF PHOTOGRAPHY
Basic shooting and Lighting Techniques and Equipment required for different genres of Photography like Black and White, Landscape, Cityscape, Architecture, Advertising, Table top photography Fashion, Food, Automobile, Sports, Travel, Children, Portrait, wild life, Still Life, Event, Silhouette, Festival and Themes.

TOTAL: 45 PERIODS

OUTCOMES
- Students will be able to utilize the principles of good composition in photography.
- Students will be able to develop an individual style in representing the society through photographs.
- Students will have a thorough understanding of how to create visual variety
- Students will understand the foundation principles of design
- Students will gain understanding in Depth of field
- Students will understand the different genres of photography.
REFERENCES
2. Balakrishna Aiyer, Digital Photojournalism, Authors press, 2005

AC5491 GREEN CHEMISTRY L T P C 3 0 0 3

OBJECTIVES
- To introduce the basic concept and principles of green chemistry for environmental management.
- To make the students know about green reagents and its importance to the environment
- To acquaint the student with green solvents and its impacts in green chemistry
- To familiarize the synthesis of materials using green methods
- To impart the knowledge on applications of green synthesis technology

UNIT I PRINCIPLES OF GREEN CHEMISTRY 9

UNIT II GREEN REAGENTS AND CATALYSTS 9
Choice of starting materials – reagents (Dimethyl carbonate, polymer supported reagents) – catalysts (microencapsulated Lewis acids, zeolites, basic catalysts polymer supported catalysts, introduction to biocatalysts).

UNIT III GREEN SOLVENTS 9
Aqueous phase reactions (Claisen rearrangement, Aldol condensation, wurtz reaction, reduction of carbon carbon double bond, oxidation of amines into nitro compounds – Electrochemical synthesis (synthesis of adiponitrile) - Ionic liquids – reactions in acidic ionic liquids- reactions in neutral ionic liquids (hydrogenations, diels - Alder reactions, Heck reactions, O-alkylation and N-alkylation, methylene insertion reactions.

UNIT IV GREEN SYNTHESSES 9
Microwave induced green synthesis (Hoffmann Elimination and Oxidation of alcohols) – Ultra sound assisted green synthesis (Esterification, Saponification and Cannizaro reaction) – Solid state green synthesis (Dehydration of alcohols to alkenes, Grignard reaction)- Solid supported organic synthesis (Synthesis of furans and pyrrole)

UNIT V APPLICATIONS OF GREEN SYNTHESIS 9

TOTAL: 45 PERIODS

OUTCOMES
- To be familiar with basic concepts of green chemistry and apply to them in various field
- To recognize the catalytic reaction with green reagents and its importance. To identify available green solvents and apply them to various synthesis process
• To recognize the preparations of materials with green process and its application to the environment.
• To gain the knowledge of preparation of various drugs using green synthesis methods
• To have the skills and technology towards green chemistry and apply in industry.

REFERENCES

AC5492 FOOD CHEMISTRY  L T P C
3 0 0 3

OBJECTIVES
• To enable the students to acquire knowledge on the macro and micro constituents of the food
• To know the structure and chemical characteristics of constituents of food.
• To demonstrate the knowledge of food chemistry and applying, the principles and concepts of chemistry as they apply to food systems.
• To familiarize the student with the relationship between water and food.
• To explain the rationale for certain food processes and preservation

UNIT I INTRODUCTION TO FOOD AND ITS PROPERTIES 12
Proteins - Enzymes - Chemistry and structure, kinetics, Maillard reaction. Food carbohydrates: Structural, nutritional and functional aspects. Emulsifiers - role of emulsifiers selection of emulsifiers based on hydrophilic and Lipophilic balance (HLB) and its application. Thickeners-definition, chemical structure, gel formation, list of permitted thickeners and food application. Chemical and biochemical changes: changes occur in foods during different processing.

UNIT II PROCESSING AND PRESERVATION 12
Scope and benefits of industrial food preservation. Preservation of foods by chemicals, antibodies, antioxidants, salt and sugar. Principles of food freezing: freezing point of foods Psychrometric chart, Freeze concentration, freeze drying, IQF. Nanotechnology: Principles and application in foods, Hurdle technology: Types of preservation techniques and their principles, concept of hurdle technology and its application.

UNIT III FLAVOURS AND COLOURING AGENTS 9
Chemistry of food flavor, definitions, Flavourmatics / flavouring compounds, flavor retention-off flavours and food taints. Colour -Natural and synthetic food colours, their chemical structure, stability, permitted list of colours, usage levels and food application.

UNIT IV WATER RELATIONS IN FOOD 6
Moisture in food: Structure, properties, Types of water in food and their specific function water activity and stability.

UNIT V FOOD ADDITIVES 6
Definitions, uses and functions of: Acids, Bases, Buffer system, chelating/sequestering agents, Antioxidants, Anti-caking agents, Firming agents. Flour bleating agents and Bread improvers. Anti-microbial agents/ class I & II.

TOTAL: 45 PERIODS

OUTCOMES
• Will know about the factors governing the food quality and chemical constituents.
• Will be able to name and describe the general chemical structures of the major components of foods and selected minor components
• Will come to know about the techniques involved in food processing and preservation

67
• Will be acquitted with food additives and their function in preservation
• Will be familiarize with the nature of packed food from industrial processes

REFERENCES

AG5491 NATURAL HAZARDS AND MANAGEMENT L T P C
                  3 0 0 3

OBJECTIVES
• To understand natural hazards.
• To learn mitigation methods for natural hazards.
• To provide knowledge on assessment and management of natural hazards.

UNIT I DISASTER PHENOMENON
Disaster threat - characteristics-parameters – mapping aspects for earthquake, landslides, tsunami, cyclones, flood, drought and epidemics.

UNIT II MITIGATION

UNIT III ASSESSMENT

UNIT IV MANAGEMENT

UNIT V CASE STUDIES AND ADVANCED TOOLS
Post disaster review – role of remote sensing and GIS – National and state level case studies on various disasters.

TOTAL: 45 PERIODS

OUTCOMES
On completion of this course, the students expected to be able to:
• Gain knowledge on natural hazards and their characteristics
• Have better understanding on geological and hydrological hazards
• Appreciate various mitigation techniques.
• Carryout risk assessment and vulnerability mapping
• Understand the role of remote sensing and GIS in natural hazard risk reduction.

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OBJECTIVES

- To understand the Sources of Marine Minerals.
- To understand the various energy resources pertain to marine system
- To understand the importance and economic aspects of marine minerals

UNIT I INTRODUCTION TO OCEANS

UNIT II OCEAN RESOURCES

UNIT III ENERGY RESOURCES
Wind Energy - Wave Energy - Tidal Energy - Ocean Current Energy - Ocean thermal energy conversion (OTEC) - osmotic power plant-Petroleum resources and radioactive nuclear mineral deposits

UNIT IV OCEAN RESOURCE EXPLORATION AND EXPLOITATION
Marine sampling - Water Samplers - Bottom Samplers - Instrumentation

UNIT V OCEAN MINERAL MINING
Mining aspects of deep-sea polymetallic sulphides - Manganese Nodules - Methane Hydrates. Sand, Sand Mining & Beach replenishment-Marine maps of Exclusive Economic Zone (EEZ)

TOTAL: 45 PERIODS

OUTCOMES

- Students will understand the various sources of marine minerals.
- Students will able to understand the Mineral deposits derived from land sources.
- Students will learn about the energy resources of marine system.
- Students will learn about various sampling methods and instrumentation.
- Students will able to understand the economic aspects of marine minerals.
REFERENCES
   Dordrecht Heidelberg London New York

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MC5491 BASIC CRYSTALLOGRAPHY AND CRYSTAL GROWTH LTPC 3 0 0 3

OBJECTIVES
- To introduce the basics of crystal symmetry and crystal structures.
- To provide students with a background to X-ray generation and detection
- To provide instruction on the steps involved in single crystal structure determination
- To teach the concept of powder X-ray diffraction and its applications
- To teach various crystal growth techniques

UNIT I CRYSTAL SYMMETRY AND STRUCTURES 9

UNIT II X-RAYS 9
X-rays - generation of X-rays - sealed tube and rotating anode generators – synchrotron radiation – continuous and characteristic X-rays - X-ray absorption – X-ray monochromators – collimation – Soller slits - X-ray detectors (principles only)

UNIT III SINGLE CRYSTAL STRUCTURE DETERMINATION 9

UNIT IV POWDER X-RAY DIFFRACTION 9
UNIT V  CRYSTAL GROWTH TECHNIQUES


TOTAL: 45 PERIODS

OUTCOMES
Upon completion of the course the students will
• understand crystal symmetry, crystal planes and simple crystal structures
• gain a knowledge of X-ray generation, absorption, monochromatization and detection
• get a working knowledge of single crystal structure determination
• get some insight into the powder diffraction and its applications
• be able to understand the basics of various crystal growth techniques

REFERENCES

MC5492  NONLINEAR SCIENCE  L T P C
3 0 0 3

OBJECTIVES
• The students will be introduced to the basics of nonlinear dynamics and its applications.
• The students will learn about the mathematical models needed to study the concepts of fixed points, oscillations, bifurcations and integrability.
• The students will know about the nonlinear dynamical phenomena in chemical systems.
• The students will understand the importance of nonlinear dynamics in biological systems.
• The students will be introduced to the concepts of nonlinear dynamical analysis in geological systems.

UNIT I  NONLINEAR DYNAMICS

UNIT II  MATHEMATICAL MODELS
First-order differential equations - separation of variables - slope fields - Euler’s method - equilibria and phase plane - bifurcations - higher-order equations - trace-determinant plane - harmonic oscillators - equilibrium point analysis - non-autonomous systems and chaos - finite dimensional integrable systems - dispersive systems - solitary waves - solitons - analysis of soliton solutions.

UNIT III  CHEMICAL SYSTEMS
UNIT IV  BIOLOGICAL SYSTEMS  

UNIT V  GEOLOGICAL SYSTEMS  

TOTAL: 45 PERIODS

OUTCOMES
After completing this course, the students should able to
- Understand the basics of nonlinear dynamics and its applications.
- Gain knowledge on the concepts of fixed points, oscillations, bifurcations and integrability.
- Appreciate the importance of nonlinear dynamical phenomena in chemical systems.
- Understand the role of nonlinear dynamics in biological systems.
- Apply nonlinear dynamical analysis for geological systems.

REFERENCES

MT5491  STATISTICAL METHODS  
L T P C  
3 0 0 3

OBJECTIVES
- To organize and describe the data and hence compute the various descriptive measures
- To give an idea of testing the statistical hypothesis claimed based on a set of data points using standard sampling distributions
- To expose to the basic principles of experimental design and hence carry out the analysis of variance
- To use non parametric methods on data sets which are not from normally distributed population
- To prepare the students to implement the various concepts in statistics using R statistical tool

UNIT I  DESCRIPTIVE STATISTICS  
Frequency distribution - Graphs of frequency distribution - Descriptive Measures - Quartiles and Percentiles - Calculation of sample mean and population mean
UNIT II  HYPOTHESIS TESTING  9
Sampling Distributions - Central Limit Theorem - Testing a Statistical Hypothesis - Tests Concerning Means and variances - Independence of Attributes - Goodness of Fit

UNIT III  ANALYSIS OF VARIANCES  9
One way and two way classification - Completely Randomized Design - Randomized Block Design - Latin Square Design

UNIT IV  NONPARAMETRIC METHODS  9
Sign Test - Wilcoxon's Signed Rank Test - Rank Sum Tests - Tests of Randomness - Kolmogrov Smirnov and Anderson Darling Tests

UNIT V  CALCULATIONS USING R  9

TOTAL: 45 PERIODS

OUTCOMES
- It equips the student to compute mean, variances, quartiles and percentiles for a large set of data points obtained from a series of measurements
- It imparts the knowledge of various test statistics used in hypothesis testing for mean and variances of large and small samples
- It enables the students to compare several means
- It makes the students use sign test and rank test which can be applied to any raw data without the underlying assumptions that the observations are from normal population.
- It equips the students to implement the various concepts learnt using R tool for statistics

REFERENCES

HS5491  PROFESSIONAL EMAIL COMMUNICATION  L T P C
3 0 0 3

UNIT I  Email as a medium of professional communication (1 hour)
   a. Clear, grammatically correct sentences
   b. Clear and coherent paragraphs
   c. Polite and professional expression
   d. Accurate punctuation

The nature of the e-mail in its present technological state
   a. The pros and cons of using email for professional communication

UNIT II  Standard email conventions and etiquette
   a. Conventions for effective emailing intra and inter workplaces (inclusive of formatting)
   b. Interpersonal etiquette to be used in professional emailing
   c. Cross-cultural dos and don’ts when using email across borders
UNIT III  Understanding email messages accurately (2 hours)
   a. Understanding the core message
   b. Understanding the writer’s intention and expectation accurately
   c. Interpreting the style and tone of the message
   d. Reading and understanding messages quickly

UNIT IV  Writing clear and contextually appropriate responses (12 hours)
   a. Writing appropriate opening and closing sentences
   b. Structuring the email logically and coherently
   c. Positioning the core message for reader attention and action
   d. Writing messages for a range of professional functions such as giving an update, reporting, requesting, clarifying and confirming, giving instructions etc.

UNIT V  Using a range of professional styles (10 hours)
   a. Maintaining courtesy and professional poise in all messages
   b. Being direct or indirect as necessary
   c. Being elaborate or brief as necessary
   d. Being assertive and decisive when needed

Learning outcome: At the end of the course, the students should
   • Understand email as a professional communication medium and as it is used in workplaces today.
   • Use standard e-mailing conventions and etiquette used in workplaces internationally.
   • Use appropriate style and tone for communicating a variety of professional messages that are generally communicated via e-mail in work and business communication.
   • Read and interpret e-mail messages accurately and write contextually appropriate responses.
   • Use English accurately while writing emails in generic professional contexts.
   • Use punctuation accurately while writing e-mail messages.

Assessment (with individualised feedback for mid-course tests):
   Mid-course Assessment -1 hour + 1 hour for feedback after evaluation
   Mid-course Assessment -2 (1 hour + 1 hour for feedback after evaluation)
   Final Assessment – 2 hours (inclusive of Email English test)

Classroom teaching methodology: Concept familiarisation will be accompanied with practice in generic professional emailing contexts. Practice tests and individualised feedback will be used feedback.

Material for the course will be teacher generated

HS5492   PROJECT REPORT WRITING   L T P C
         3 0 0 3

OBJECTIVES
The Course aims to:
   • Develop project writing skills
   • Give engineering and technology students practice in writing a project report
   • Enhance their awareness on the importance of report writing in the professional context
UNIT I  WRITING

UNIT II  REPORT WRITING

UNIT III  PROJECT REPORT
Structure of the Project Report: (Part 1) Framing a Title – Content – Acknowledgement – Funding Details - Abstract – Introduction – Aim of the Study – Background - Writing the research question - Need of the Study/Project Significance, Relevance – Determining the feasibility – Theoretical Framework

UNIT IV  STRUCTURE OF REPORT
Structure of the Project Report: (Part 2) – Literature Review, Research Design, Methods of Data Collection - Tools and Procedures - Data Analysis - Interpretation - Findings –Limitations - Recommendations – Conclusion – Bibliography

UNIT V  PROOF READING
Proof reading a report – Avoiding Typographical Errors – Bibliography in required Format – Font – Spacing – Checking Tables and Illustrations – Presenting a Report orally – Techniques

TOTAL: 45 PERIODS

OUTCOMES
At the end of the course students will be able to,
- Write reports successfully
- Analyze issues threadbare and arrive at findings based on the analysis
- Write reports for different purposes

REFERENCE BOOKS:

HS5493  BASIC PRESENTATION SKILLS  L  T  P  C
3  0  0  3

OBJECTIVES
The course aims to:
- Develop public speaking skills among students of engineering and technology
- Enhance the presentation skills of students
- Heighten the awareness related to the fundamentals of presentations

UNIT I  PRESENTATION SKILLS
Presentation skills – Characteristics of an effective Oral Presentation – Audience - Context, Content, Speaker Status - Purpose – Modus Operandi – Extempore
UNIT II PRESENTATION DO S AND DON’TS
Emphasis on syllable stress, pronunciation, intonation, pauses, pace - Preparation for a presentation – Avoiding plagiarism – Ample use of Referencing skills – Efficient ways of Collecting and Collating data (due emphasis on important information)

UNIT III STRUCTURE

UNIT IV TIME MANAGEMENT

UNIT V GROUP PRESENTATION
Presentation skills – Guidelines – Group Presentation- Creative approaches to presenting – Technical presentation - Speaking under time constraint – variations in pitch, tone & intonation - Credibility in presentation (Use of authentic data/information) Podium panache – Effective Delivery

TOTAL: 45 PERIODS

REFERENCES

AUDIT COURSES (AC)
AX5091 ENGLISH FOR RESEARCH PAPER WRITING

OBJECTIVES
- Teach how to improve writing skills and level of readability
- Tell about what to write in each section
- Summarize the skills needed when writing a Title
- Infer the skills needed when writing the Conclusion
- Ensure the quality of paper at very first-time submission

UNIT I INTRODUCTION TO RESEARCH PAPER WRITING
Planning and Preparation, Word Order, Breaking up long sentences, Structuring Paragraphs and Sentences, Being Concise and Removing Redundancy, Avoiding Ambiguity and Vagueness
UNIT II  PRESENTATION SKILLS  6
Clarifying Who Did What, Highlighting Your Findings, Hedging and Criticizing, Paraphrasing and Plagiarism, Sections of a Paper, Abstracts,

UNIT III  TITLE WRITING SKILLS  6
Key skills are needed when writing a Title, key skills are needed when writing an Abstract, key skills are needed when writing an Introduction, skills needed when writing a Review of the Literature, Methods, Results, Discussion, Conclusions, The Final Check

UNIT IV  RESULT WRITING SKILLS  6
Skills are needed when writing the Methods, skills needed when writing the Results, skills are needed when writing the Discussion, skills are needed when writing the Conclusions.

UNIT V  VERIFICATION SKILLS  6
Useful phrases, checking Plagiarism, how to ensure paper is as good as it could possibly be the first-time submission

TOTAL: 30 PERIODS

OUTCOMES
CO1 – Understand that how to improve your writing skills and level of readability
CO2 – Learn about what to write in each section
CO3 – Understand the skills needed when writing a Title
CO4 – Understand the skills needed when writing the Conclusion
CO5 – Ensure the good quality of paper at very first-time submission

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AX5092 DISASTER MANAGEMENT  L T P C
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OBJECTIVES:
• Summarize basics of disaster
• Explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.
• Illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
• Describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
• Develop the strengths and weaknesses of disaster management approaches
UNIT I  INTRODUCTION TO DISASTER  6
Disaster: Definition, Factors and Significance; Difference between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

UNIT II  REPERCUSSIONS OF DISASTERS AND HAZARDS  6

UNIT III  DISASTER PRONE AREAS IN INDIA  6
Study of Seismic Zones; Areas Prone To Floods and Droughts, Landslides and Avalanches; Areas Prone To Cyclonic and Coastal Hazards with Special Reference to Tsunami; Post-Disaster Diseases and Epidemics

UNIT IV  DISASTER PREPAREDNESS AND MANAGEMENT  6
Preparedness: Monitoring of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological And Other Agencies, Media Reports: Governmental and Community Preparedness.

UNIT V  RISK ASSESSMENT  6
Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People’s Participation in Risk Assessment. Strategies for Survival

TOTAL: 30 PERIODS

OUTCOMES
CO1: Ability to summarize basics of disaster
CO2: Ability to explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.
CO3: Ability to illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
CO4: Ability to describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
CO5: Ability to develop the strengths and weaknesses of disaster management approaches

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OBJECTIVES

- Illustrate the basic Sanskrit language.
- Recognize Sanskrit, the scientific language in the world.
- Appraise learning of Sanskrit to improve brain functioning.
- Relate Sanskrit to develop the logic in mathematics, science & other subjects enhancing the memory power.
- Extract huge knowledge from ancient literature.

UNIT I  ALPHABETS  6
Alphabets in Sanskrit

UNIT II  TENSES AND SENTENCES  6
Past/Present/Future Tense -- Simple sentences

UNIT III  ORDER AND ROOTS  6
Order - Introduction of roots

UNIT IV  SANSKRIT LITERATURE  6
Technical information about Sanskrit literature

UNIT V  TECHNICAL CONCEPTS OF ENGINEERING  6
Technical concepts of Engineering - Electrical, Mechanical, Architecture, Mathematics

TOTAL: 30 PERIODS

OUTCOMES

- CO1 - Understanding basic Sanskrit language.
- CO2 - Write sentences.
- CO3 - Know the order and roots of Sanskrit.
- CO4 - Know about technical information about Sanskrit literature.
- CO5 - Understand the technical concepts of Engineering.

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REFERENCES

1. “Abhyaspustakam” – Dr. Vishwas, Samskrita-Bharti Publication, New Delhi

AX5094  VALUE EDUCATION  L T P C  2 0 0 0

OBJECTIVES

Students will be able to

- Understand value of education and self-development
- Imbibe good values in students
- Let the students know about the importance of character
UNIT I SELF DEVELOPMENT

UNIT II CULTIVATION OF VALUES

UNIT III BEHAVIOUR DEVELOPMENT

UNIT IV CHARACTER AND COMPETENCE

TOTAL: 30 PERIODS

OUTCOMES
Students will be able to
- Knowledge of self-development.
- Learn the importance of human values.
- Developing the overall personality.

SUGGESTED READING
1. Chakroborty, S.K. Values and Ethics for Organizations Theory and Practice, Oxford University Press, New Delhi

AX5095 CONSTITUTION OF INDIA

OBJECTIVES
Students will be able to:
- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional
- Role and entitlement to civil and economic rights as well as the emergence nationhood in the early years of Indian nationalism.
- To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

UNIT I HISTORY OF MAKING OF THE INDIAN CONSTITUTION
History, Drafting Committee, (Composition & Working)

UNIT II PHILOSOPHY OF THE INDIAN CONSTITUTION:
Preamble, Salient Features
UNIT III CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES
Fundamental rights, right to equality, right to freedom, right against exploitation, right to freedom of religion, cultural and educational rights, right to constitutional remedies, Directive Principles of State Policy, Fundamental Duties.

UNIT IV ORGANS OF GOVERNANCE
Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.

UNIT V LOCAL ADMINISTRATION

UNIT VI ELECTION COMMISSION
Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners - Institute and Bodies for the welfare of SC/ST/OBC and women.

TOTAL: 30 PERIODS

OUTCOMES
Students will be able to:
- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
- Discuss the passage of the Hindu Code Bill of 1956.

SUGGESTED READING
1. The Constitution of India, 1950 (Bare Act), Government Publication.

AX5096 PEDAGOGY STUDIES

OBJECTIVES
Students will be able to:
- Review existing evidence on the review topic to inform programme design and policy
- Making under taken by the DfID, other agencies and researchers.
- Identify critical evidence gaps to guide the development.

UNIT I METHODOLOGY
Aims and rationale, Policy background, Conceptual framework and terminology - Theories of learning, Curriculum, Teacher education - Conceptual framework, Research questions - Overview of methodology and Searching.
UNIT II THEMATIC OVERVIEW
Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries - Curriculum, Teacher education.

UNIT III EVIDENCE ON THE EFFECTIVENESS OF PEDAGOGICAL PRACTICES
Methodology for the in depth stage: quality assessment of included studies - How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? - Theory of change - Strength and nature of the body of evidence for effective pedagogical practices - Pedagogic theory and pedagogical approaches - Teachers’ attitudes and beliefs and Pedagogic strategies.

UNIT IV PROFESSIONAL DEVELOPMENT
Professional development: alignment with classroom practices and follow up support - Peer support - Support from the head teacher and the community - Curriculum and assessment - Barriers to learning: limited resources and large class sizes

UNIT V RESEARCH GAPS AND FUTURE DIRECTIONS
Research design – Contexts – Pedagogy - Teacher education - Curriculum and assessment - Dissemination and research impact.

TOTAL: 30 PERIODS

OUTCOMES
Students will be able to understand:
- What pedagogical practices are being used by teachers’ informal and informal classrooms in developing countries?
- What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
- How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?

SUGGESTED READING

AX5097 STRESS MANAGEMENT BY YOGA

OBJECTIVES
- To achieve overall health of body and mind
- To overcome stress
UNIT I  YOGA
Definitions of Eight parts of yoga (Ashtanga)

UNIT II  DOS AND DON'TS
Yam and Niyam - Dos and Don't's in life - i) Ahinsa, satya, astheya, bramhacharya and aparigraha, ii) Ahinsa, satya, astheya, bramhacharya and aparigraha.

UNIT III  PRANAYAM
Asanand Pranayam - Various yoga poses and their benefits for mind & body - Regularization of breathing techniques and its effects - Types of pranayam.

TOTAL: 30 PERIODS

OUTCOMES
Students will be able to:
- Develop healthy mind in a healthy body thus improving social health also.
- Improve efficiency

SUGGESTED DREADING
1. ‘Yogic Asanas for Group Training - Part I’ Janardan Swami Yogabhya Mandal, Nagpur
2. ‘Raja yoga or conquering the Internal Nature” by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata.

AX5098 PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS L T P C

OBJECTIVES
- To learn to achieve the highest goal happily
- To become a person with stable mind, pleasing personality and determination
- To awaken wisdom in students

UNIT I  HOLISTIC DEVELOPMENT
Neetisatakam - holistic development of personality - Verses- 19, 20, 21, 22 (wisdom) - Verses- 29, 31, 32 (pride & heroism) – Verses- 26, 28, 63, 65 (virtue) - Verses- 52, 53, 59 (don'ts) - Verses- 71, 73, 75, 78 (dos)

UNIT II  DUTIES
Approach to day to day work and duties - Shrimad Bhagawad Geeta: Chapter 2 - Verses 41, 47, 48 - Chapter 3 - Verses 13, 21, 27, 35 Chapter 6 - Verses 5, 13, 17, 23, 35 - Chapter 18 - Verses 45, 46, 48.

UNIT III  BASIC KNOWLEDGE
Statements of basic knowledge - Shrimad Bhagawad Geeta: Chapter 2 - Verses 56, 62, 68 Chapter 12 - Verses 13, 14, 15, 16, 17, 18 - Personality of role model - Shrimad Bhagawad Geeta - Chapter 2 - Verses 17, Chapter 3 - Verses 36, 37, 42 - Chapter 4 - Verses 18, 38, 39 Chapter 18 – Verses 37, 38, 63

TOTAL: 30 PERIODS

OUTCOMES
Students will be able to:
- Study of Shrimad - Bhagwad - Geeta will help the student in developing his personality and achieve the highest goal in life
- The person who has studied Geeta will lead the nation and mankind to peace and prosperity
- Study of Neetisatakam will help in developing versatile personality of students.
SUGGESTED READING
1. Gopinath, Rashtriya Sanskrit Sansthanam P, Bhartrihari’s ThreeSatakam, Niti-Sringar-Vairagya, New Delhi, 2010