Semester 3rd		Contact Hours			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
BGWDS1-301	Data Structures	3	1	0	40	60	100	4
BGWDS1-302	Elements of Design	3	1	0	40	60	100	4
BGWDS1-303	Database Management Systems	3	1	0	40	60	100	4
BGWDS1-304	Image Editing & Photography	3	0	0	40	60	100	3
BGWDS1-305	Software Lab VII (Based on Data Structures)	0	0	4	60	40	100	2
BGWDS1-306	Software Lab VIII (Based on Elements of Design)	0	0	4	60	40	100	2
BGWDS1-307	Software Lab IX (Based on Database Management Systems)	0	0	4	60	40	100	2
BGWDS1-308	Software Lab X(Image Editing & Photography)	0	0	2	20	30	50	1
BGWDS1-309	Mentoring and Professional Development	0	0	1	25	--**	25	1
Total		12	3	15	385	390	775	23

** The Mentoring and Professional Development course will have internal evaluation only. (See guidelines at the last page of this file)

Semester 4th		Contact Hours			Marks			Credits
Subject Code	Subject Name	L	T	P	Int.	Ext.	Total	
BGWDS1-401	Programming in Python	3	1	0	40	60	100	4
BGWDS1-402	Digital Marketing	3	1	0	40	60	100	4
BGWDS1-403	Computer Graphics	3	1	0	40	60	100	4
BGWDS1-404	Video Editing	3	0	0	40	60	100	3
BGWDS1-405	Software Lab XI(Based on Programming in Python)	0	0	4	60	40	100	2
BGWDS1-406	Software Lab XII(Based on Digital Marketing)	0	0	4	60	40	100	2
BGWDS1-407	Software Lab XIII(Based on Computer Graphics)	0	0	4	60	40	100	2
BGWDS1-408	Software Lab XIV(Based on Video Editing)	0	0	2	20	30	50	1
BGWDS1-409	Mentoring and Professional Development	0	0	1	25	--**	25	1
Total		12	3	15	385	390	775	23

** The Mentoring and Professional Development course will have internal evaluation only. (See guidelines at the last page of this file)

Semester 5th		Contact Hours			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BGWDS1-501	Multimedia 2D & 3D Designing	3	1	0	40	60	100	4
BGWDS1-502	Lighting and Rendering	3	1	0	40	60	100	4
BGWDS1-503	Social media And Web Analytics	3	0	0	40	60	100	3
BGWDS1-504	Software Lab XV (Based on Multimedia 2D & 3D Designing Laboratory)	0	0	4	60	40	100	2
BGWDS1-505	Software Lab XVI (Based on Lighting and Rendering Laboratory)	0	0	4	60	40	100	2
BGWDS1-506	Software Lab XVII (Based on social media And Web Analytics)	0	0	4	60	40	100	2
BGWDS1-507	Mentoring and Professional Development	0	0	1	25	--**	25	1
YYYY	Department Elective – I	3	0	0	40	60	100	3
Total		**12**	**2**	**13**	**365**	**360**	**725**	**21**

** The Mentoring and Professional Development course will have internal evaluation only. (See guidelines at the last page of this file)

Department Elective –I Course Title:
Cyber Attack   **(BGWDD1-511)**
Software Testing & Quality Assurance **(BGWDD1-512)**
Artificial Intelligence **(BGWDD1-513)**

Semester 6th		Contact Hours			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BGWDS1-601	Animation Art	3	1	0	40	60	100	4
BGWDS1-602	Motion Graphics & Compositing	3	1	0	40	60	100	4
BGWDS1-603	Introduction to Gaming	3	1	0	40	60	100	4
YYYY	Department Elective -II	3	0	0	40	60	100	3
BGWDS1-604	Software Lab-XVIII (Based on Animation Art)	0	0	4	60	40	100	2
BGWDS1-605	Software Lab-XIX (Based on Motion Graphics & Compositing)	0	0	4	60	40	100	2
BGWDS1-606	Software Lab -XX (Based on Introduction to Gaming)	0	0	4	60	40	100	2
BGWDS1-607	Project	0	0	2	60	40	100	1
BGWDS1-608	Mentoring and Professional Development	0	0	1	25	--**	25	1
Total		**12**	**3**	**15**	**425**	**400**	**825**	**23**

** The Mentoring and Professional Development course will have internal evaluation only. (See guidelines at the last page of this file)

Department Elective - II Course Title
Cyber Forensics **(BGWDD1-611)**
Machine Learning **(BGWDD1-612)**
Software Architectural & Design Pattern **(BGWDD1-613)**

3RD SEMESTER

Data Structures

Subject Code- BGWDS1-301   **L T P C**   **Total Hours: 60 hrs.**
                                                3 1 0 4

Course Outcomes

1. Use appropriate data structures for problem solving and programming.
2. Understand basic data structures such as arrays, linked lists, stacks and queues and solve problems involving graphs, trees and heaps.
3. Apply appropriate searching and/or sorting techniques for application development.

UNIT-I (14 Hrs.)

Introduction to Data Structures: Algorithms and flowcharts, basics analysis on algorithm, complexity of algorithm, introduction and definition of data structure, classification of data, arrays, various types of data structure, static and dynamic memory allocation, function and recursion.

Arrays, Pointers and Strings: Introduction to arrays- definition, one dimensional array and multidimensional arrays, pointer, pointer to structure, array and pointer, strings- introduction to strings, definition, library functions of strings.

UNIT-II (15 Hrs.)

Stack: Introduction to stack, definition, stack implementation, operations of stack, applications of stack, multiple stacks- implementation of multiple stacks.

Queue: Introduction to queue, definition, queue implementation operations of queue, circular queue, de-queue and priority queue.

UNIT-III (17 Hrs.)

Linked List: Introduction, representation and operations of linked lists, singly linked list, doubly linked list, circular linked list, and circular doubly linked list.

Tree: Introduction to tree, tree terminology binary tree, binary search tree, strictly binary tree, complete binary tree, tree traversal, threaded binary tree, avl tree b tree, b+ tree.

UNIT-IV (14 Hrs.)

Graphs: Introduction, representation to graphs, graph traversals, shortest path algorithms.

Searching and Sorting: Searching, types of searching, sorting, types of sorting like quick sort, bubble sort, merge sort, selection sort.

Hashing: Hash function, types of hash functions, collision, collision resolution technique (CRT) and perfect hashing.

Reference Books:

1. Horowitz & Sawhaney: Fundamentals of Data Structures, Galgotia Publishers.
2. Tenenbaum, Y. Lanhghsam and A. J. Augenstein, "Data Structures Using C and C++", Prentice Hall of India.
3. Seymour Lipschutz "Theory & Practice of Data Structures", McGraw Hill..

Elements of Design

Subject Code: BGWDS1-302	L T PC	Total Hours: 60 hrs.
	3 1 0 4	

Course outcomes:

1. Learn about the components of Design..
2. Learn methods & means to create images using the elements of design – space, depth, overlaps, transparency, plane, volume etc.
3. Gain the knowledge of formal systems of visual representation.

UNIT-I (15 Hrs.)

Introduction: Visual perception and design: introduction of art and ideas - visual & critical thinking and analysis of 2 dimensional (2d) art through history, theoretical introduction to the perception, phenomenology, definition of design –different applications of design.

Design Elements: Elements of design: The concepts of design space and concepts of design, visual elements - line and shape, form, value, texture, color - measure, type, direction, character visual elements.

UNIT-II (17 Hrs.)

Principles of Design: Composition in contrast: Black and white, positive and negatives, tessellation, units and their shapes, transformations, alteration, unity and variety / element of interest, contrast, elaboration, dominance, expressive content, color and composition – balance, harmony and rhythm.

UNIT-III (14 Hrs.)

Composition: Three principles- unity, balance, center of interest, achieving emphasis- light shade, details, contrasts, balance- asymmetrical balance, informal balance, radial balance.

Text: Type; text and meaning, typography as text and as image, typography as text and as image combined with pictorial representation.

UNIT-IV (14 Hrs.)

Color Wheel: Mixing of primary, secondary and tertiary colors, tint, shades, hues, tones, warm colors and cool colors, different color schemes (complimentary, split complementary, analogous, triadic etc.).

Reference books:

1. The Elements of Graphic Design, Alex W. White, Second Edition, Allworth Publications, 2011.

Database   Management Systems

Subject Code: BGWDS1-303   **L T P C**   **Total Hours: 60 hrs.**
                                       3 1 0 4

Course outcomes:

1. Understand the basic concepts of DBMS.
2. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
3. Understand the concept of Transaction and Query processing in DBMS.

UNIT-I (14 Hrs.)

Introduction: Introduction of DBMS, data modeling for a database, three level architecture of DBMS, components of a DBMS.

Data Models: Hierarchical, network and relational model, comparison of network, hierarchical and relational model, entity relationship model.

UNIT-II (15 Hrs.)

Relational Database: Relational algebra and calculus, SQL fundamentals, DDL, DML, DCL, PL/SQL concepts, cursors, stored procedures, stored functions, database triggers.

UNIT-III (17 Hrs.)

Introduction to Normalization: First, second, third normal forms, dependency preservation, Boyce-Codd normal form, multi-valued dependencies and fourth normal form, join dependencies and fifth normal form, domain-key normal form (DKNF).

UNIT-IV (14 Hrs.)

Database Recovery: Concurrency management, database security, integrity and control, structure of a distributed database, design of distributed databases.

Reference Books:

1. "SQL, PL/SQL The Programming Language of Oracle", Ivan Bayross, BPB Publications, 4th Revised Edition (2009)
2. "An Introduction to Database Systems", C. J. Date, A. Kannan, S. Swamynathan, 8th Edition, Pearson Education, (2006).

Image Editing & Photography

Subject Code: BGWDS1-304   **L T P C**   **Total Hours: 45 hrs.**
                                                     3 0 0 3

Course outcomes:

1. Know about the basic functions and features of digital camera
2. Understanding of describing image quality and being able to enhance it.
3. Learn the various formats of camera and functioning of SLR camera and its controls.

UNIT-I (11 Hrs.)

Camera Controls: Introduction of camera: its parts and types. Menu items and shooting modes (Auto vs. Scene vs. Priority).

Exposure, Black and White Conversion, Intro to Lighting: Black and White photographs angle and their conceptual editing - Black &White conversion practice Exposure compensation. Concept of high- and low key Studio session.

UNIT-II (13 Hrs.)

The Portrait: Introduction of Portrait Image and its types. Discussion of portrait genres and lighting techniques (studio, natural) Review aperture, shutter speed, ISO. Practice, editing and cropping.

Composition tips, and Shooting: Composition tips and photography shooting methods. Night/Day photography and low light shooting and their differences.

UNIT-III (11 Hrs.)

Conceptual Photography and Contemporary Art: Photography Methods for conceptual click. Contemporary art shoot and editing techniques.

Creating a Body of Work: Sequence editing Trouble shooting with editing.

UNIT-IV (10 Hrs.)

Basics of Editing: Introduction to Editing, fixing blemishes, color correcting and selective edits.

Output: Ready images for final output. Web vs. print. Color space conversion.

Reference Books:

1. Tate - The Photography Ideas Book, Lorna Yabsley, 2019.

Software Lab VII (Based on Data Structures)

Subject Code: BGWDS1-305   **L T P C**   **Total Hours: 60 hrs.**
                                       0 0 4 2

This laboratory course will comprise of following assignments and projects:

1. Program for implementing selection sort.
2. Program for implementing insertion sort.
3. Program for implementing quick sort.
4. Program for implementing merge sort.
5. Program for implementing Stack using array.
6. Program for converting infix to postfix form.
7. Program for implementing Queue using array.
8. Program for implementing Binary Search Tree.
9. Program for implementing Singly Linked list.
10. Program for Breadth First Search (BFS) for graph traversal.
11. Program for Depth First Search (DFS) for graph traversal.

Software Lab VIII (Based on Elements of Design)

Subject Code: BGWDS1-306	L T P C	Total Hours: 60 hrs.
	0 0 4 2	

This laboratory course will comprise of following assignments and projects:

1. Assignment on pattern design by sketching
2. Assignment on creating cartoon character design.
3. Assignment on visual logo designing
4. Assignment on designing 5 different types of conceptual Branding creative.
5. Assignment on magazine covers design by using typography.
6. Assignment on line and shape design
7. Assignment on creating character visual elements design
8. Assignment on Masking and Manipulation of pictures
9. Assignment on to develop one creative by Radial Balance.
10. Assignment on creating design by mixing Primary, Secondary and Tertiary Colors.
11. Assignment on text and as image combined with pictorial representation.
12. Assignment on creating Background design by using Warm Colors and Cool Colors.
13. Assignment on design & Print any five most important activities of your college in a collage.
14. Assignment on designing & Printing any brochure.

Software Lab IX (Based on Database Management Systems)

Subject Code: BGWDS1-307   **L T P C**   **Total Hours: 60 hrs.**
                                      0 0 4 2

This laboratory course will comprise of following assignments and projects:

1. Use of CREATE, ALTER, RENAME and DROP statement in the database tables (relations)
2. Use of INSERT INTO, DELETE and UPDATE statement in the database tables (relations)
3. Use of simple select statements.
4. Use of select query on two relations
5. Use of nesting of queries.
6. Use of aggregate functions.
7. Use of substring comparison.
8. Use of order by statement.
9. Count the customers with grades above Amritsar's average.
10. Find the name and numbers of all salesmen who had more than one customer.
11. List all salesmen and indicate those who have and don't have customers in their cities (Use UNION operation.)
12. Create a view that finds the salesman who has the customer with the highest order of a day.
13. Demonstrate the DELETE operation by removing salesmen with id 1000. All his orders must also be deleted.
14. Write a PL/SQL code to add two numbers and display the result. Read the numbers during run time.
15. Write a PL/SQL code to find sum of first 10 natural numbers using while and for loop.

Software Lab X (Image Editing & Photography)

Subject Code: BGWDS1-308   **L T P C**   **Total Hours: 30hrs.**
                                                  0 0 2 1

This laboratory course will comprise of following assignments and projects:

1. Assignment on lighting techniques for product photography and portrait photography.
2. Assignment on photo shoots (Exposure, Role of different focal lengths, Visual Composition).
3. Assignment on clicking the photos from different genres.
4. Assignment on digital workflow (Editing the image in the software).
5. Assignment on working with strobe lights & on-camera Flash.
6. Assignment on detailed understanding of exposure metering.
7. Assignment on digital workflow (Digital black and white photography).
8. Assignment on High Dynamic Range (HDR Photography).
9. Assignment on studio photography techniques (post shoot processing of photographs).
10. Assignment on the submission of Theme/Project based campaign.

4TH SEMESTER

Programming in Python

Subject Code- BGWDS1-401   **L T P C**   **Total Hours: 60 hrs.**
3 1 0 4

Course Outcomes:

1. Familiar with Python environment, data types, operators used in Python and Learn the use of control structures and numerous native data types
2. Design user defined functions, modules, and packages and exception handling methods.
3. Create and handle files in Python and learn Object Oriented Programming Concepts

UNIT-I (17 Hrs.)

Introduction to Python Programming Language: Programming Language, History and Origin of Python Language, Features of Python, Limitations, Major Applications of Python, Getting, Installing Python, Setting up path and environment variables, Running Python, First Python Program, Python interactive help feature, Python differences from other languages.

Python Data Types & Input/Output: Keywords, Identifiers, Python Statement, Indentation, Documentation, Variables, Understanding Data Type, Python Input and Output Functions, Import command.

Operators and Expressions: Operators in Python, Expressions, Precedence, Associativity of Operators, Non Associative Operators.

UNIT-II (14 Hrs.)

Control Structures: Decision making statements, Python loops, Python control statements.
Python Native Data Types: Numbers, Lists, Tuples, Sets, Dictionary, Functions & Methods of Dictionary, strings.

UNIT-III (15 Hrs.)

Python Functions: Functions, Advantages of Functions, Built-in Functions, User defined functions, Anonymous functions, Pass by value Vs. Pass by Reference, Recursion, Scope and Lifetime of Variables.

Python Modules: Module definition, Need of modules, Creating a module, Importing module, Path searching of a module, module reloading, Standard Modules, Python Packages.

UNIT-IV (14 Hrs.)

Exception Handling: Exceptions, Built-in exceptions, Exception handling, User defined exceptions in Python.

File Management in Python: Operations on files (opening, modes, attributes, encoding, closing), read () & write () methods, tell() & seek() methods, renaming & deleting files in Python.

Classes and Objects: The concept of OOPS in Python, Designing classes, Creating objects, Accessing attributes, Editing class attributes, Built-in class attributes, Garbage collection, Destroying objects.

Reference Books:

1. Python, The complete Reference, Martin C. Brown, Mc Graw Hill Education.

2. Python in a Nutshell, A. Martelli, A. Ravenscroft, S. Holden, OREILLY.

Digital Marketing

Subject Code- BGWDS1-402 **L T P C** **Total Hours: 60 hrs.**
                                 3 1 0 4

Course Outcomes:

1. Learn how to use new media such as mobile, search and social networking.
2. Understand how and why to use digital marketing for multiple goals within a larger
3. Marketing and/or media strategy.
4. Understand the major digital marketing channels - online advertising: Digital display,
5. Video, mobile, search engine, and social media.

UNIT-I (14 Hrs.)

Introduction to Digital Marketing: Difference between Traditional Marketing and Digital Marketing, Benefits of using Digital Media, Inbound and Outbound Marketing, Online marketing POEM: (Paid, Owned, and Earned Media), Components of Online Marketing (Email, Forum, Social network, Banner, Blog), Impact of Online Marketing, Basics of Affiliate Marketing, Viral Marketing, Influencer Marketing, Referral Marketing.

Email Marketing: Email newsletters, Digests, Dedicated Emails, Lead Nurturing, Sponsorship Emails and Transactional Emails, Drawbacks of Email Marketing.

Social Media Marketing (SMM): Different types of Social Media Marketing like Facebook, LinkedIn, Twitter, Video, Instagram etc.

UNIT-II (17 Hrs.)

Search Engine Optimization (SEO): About SEO, Need of an SEO friendly website, Importance of Internet and Search Engines; Role of Keywords in SEO.

On-Page Optimization (Onsite): Basics of Website Designing / Development; HTML Basics for SEO; Onsite Optimization Basics; Website Structure and Navigation Menu Optimization; SEO Content Writing. Keywords Research and Analysis (eg. SWOT analysis of website, finding appropriate keywords).

Off Page Optimization: Introduction; Local marketing of websites depending on locations; Promoting Subsequent pages of the website. Introduction to organic SEO vs non-organic SEO; Social Media Optimization Techniques and Page Rank Technology.

UNIT–III (15 Hrs.)

Website Planning & Creation Content Marketing Strategy: Goals and concepts, Strategic building blocks Content creation & channel distribution, Tools of the trade, Advantages and challenges.
 Keywords Research and Analysis: Introduction to Keyword Research; Business Analysis; Types of Keywords; Keywords Analysis Tools.

Web Presence: How to increase online presence and drive more traffic for a website, Search result visibility in search engines for chosen keyword and phrases, Using e-mail marketing to drive traffic for a website, Posting social media content for lead generation, Tools to create and manage content, Use of Blogging as content strategy.

Creating content: Writing and posting content on the web and in social networks, blog and video; Create, manage and implement a content marketing strategy; Monitoring and recording results to improve content marketing campaigns; Successful content marketing strategies and case studies.

UNIT-IV (14 Hrs.)

Online Advertising, Mobile Marketing and Web analytics: Introduction to Online Advertising and its advantages, Paid versus Organic, Pay Per Click (PPC) Model. Basic concepts Cost per Click (CPC), CPM, CTR, CR etc. About Mobile Marketing, Objectives of Mobile Advertising, Creating a Mobile Marketing Strategy, Introduction to SMS Marketing. About Web.

Reference Books:

1. Ian Dodson, The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted and Measurable Online Campaigns, Publication Wiley India Pvt Ltd.
2. Philip Kotler, Hermawan Kartajaya, Iwan Setiawan, Marketing 4.0: Moving from Traditional to Digital, Publication Wiley India Pvt Ltd.
3. Venkataramana Rolla, "Digital Marketing Practice guide for SMB: SEO, SEM and SMM", CreateSpace Independent Publishing Platform, First edition.
4. Enge, E., Spencer, S., Stricchiola, J., & Fishkin, R. (2012). The art of SEO. "O'Reilly Media, Inc.".

Computer Graphics

Subject Code- BGWDS1-403   **L T P C**   **Total Hours: 60 hrs.**
                                    3 1 0 4

Course Outcomes:

1. Let students understand the basics of Computer Graphics, Input/output primitive and basic transformations, which can be applied to objects of graphics.
2. To Develop The Logical And Reasoning Skills Of The Students.
3. Learn Graphical primitives and their algorithms.

UNIT-I (17 Hrs.)

Introduction to Computer Graphics: Applications of Computer Graphics. Graphs and Types of Graphs.

Input Devices: Light Pens, Graphic Tablets, Joysticks, Track Ball, Data Glove, Digitizers, Image Scanner.

Video Display Devices: Refresh Cathode Ray Tube, Raster Scan Displays, Random Scan Displays, Color CRT-monitors and Color generating techniques (Shadow Mask, Beam Penetration), Flat-Panel Displays; 3-DViewing Devices, Graphics Monitors And Workstations, Color Models(RGB and CMY), Lookup Table.

Introduction Virtual Reality & Environments: Applications in Engineering, Architecture, Education, Medicine, Entertainment, Science, Training.

UNIT-II (14 Hrs.)

Scan-conversions: Process and need of Scan Conversion, Scan conversion algorithms for Line, Circle and Ellipse using direct method, Bresenham's algorithms for line & circle and Midpoint Ellipse Algorithm along with their derivations, Area Filling Techniques, Flood Fill Techniques, Character Generation.

UNIT-III (15 Hrs.)

2–Dimensional Graphics: Cartesian and need of Homogeneous coordinate system, Geometric Transformations (Translation, Scaling, Rotation, Reflection, Shearing),Viewing transformation and clipping (line, polygon and text) using Cohen-Sutherland, Sutherland Hodgeman and Liang Barsky algorithm for clipping

UNIT-IV (14 Hrs.)

3–Dimensional Graphics: Introduction to 3-dimensional Graphics: Geometric Transformations (Translation, Scaling, and Rotation), Mathematics of Projections (Parallel & Perspective).Color Shading. Introduction to Morphing Techniques.

Reference Books:

1. D. Hearn and M.P. Baker, Computer Graphics, PHI New Delhi.
2. J.D. Foley, A.V. Dam, S.K. Feiner, J.F. Hughes, R.L Phillips, Computer Graphics Principles & Practices, Second Edition, Pearson Education,2007.
3. R.A. Plastock and G. Kalley, Computer Graphic, McGraw Hill, 1986.

Video Editing

Subject Code- BGWDS1-404   **L T P C**   **Total Hours:-45 hrs.**
                                3 0 0 3

Course Outcomes:
1. Create different modes using various sounds, which will further help them integrate the same into their film projects.
2. Know about editing basics, tools and broadcast systems.
3. Knowledge of working with footages in an editing software.

UNIT-I (11 Hrs.)

Sound: Introduction to Audio, interrelationship between sound, culture and media theory. Ear Training, Critical listening, Role of sound in film, Storytelling through sound, Sound editing, working with Dialogue.

UNIT-II (10 Hrs.)

Mixing: The mixing process, Monitoring basics of mixing, Basic Mixing Rules and techniques, Equalizing, Audio equipment, Studio Production Techniques, Effects introduction, overview, compression.

UNIT –III (11 Hrs.)

Audio Formats - Digital and Analogue practical assignments and practice, Mastering -Introduction to mastering - Mastering setups – Monitoring (The whole practice will be done practically).

UNIT-IV (13 Hrs.)

Voiceover-The art of voiceover, how to lend voice to a short film, Voice modulation, voice sync. Submission-Design a soundtrack for a short film.

Reference Books:
1. Editing Digital Video (Digital Video and Audio Series, Robert Goodman & Patrick McGrath, McGraw-Hill Education, 2002.

Software Lab XI (Based on Programming in Python)

Subject Code: BGWDS1-405   **L T P C**   **Total Hours: 60 hrs.**
                                      0 0 4 2

This laboratory course will comprise exercises to supplement that is learnt under the Subject.

1. Compute sum, subtraction, multiplication, division and exponent of given variables input by the user.
2. Compute area of following shapes: circle, rectangle, triangle, square, trapezoid and Parallelogram.
3. Compute volume of following 3D shapes: cube, cylinder, cone and sphere.
4. Compute and print roots of quadratic equation $ax^2+bx+c=0$, where the values of a, b, and c are input by the user.
5. Print numbers up to N which are not divisible by 3, 6, 9,, e.g., 1, 2, 4, 5, 7,….
6. Write a program to determine whether a triangle is isosceles or not?
7. Print multiplication table of a number input by the user.
8. Compute sum of natural numbers from one to n number.
9. Print Fibonacci series up to n numbers e.g. 0 1 1 2 3 5 8 13…..n
10. Compute the factorial of a given number.
11. Count occurrence of a digit 5 in a given integer number input by the user.
12. Print Geometric and Harmonic means of a series input by the user.

Software Lab XII (Based on Digital marketing)

Subject Code: BGWDS1-406	L T PC	Total Hours: 60 hrs.
	0 0 4 2	

This laboratory course will comprise exercises to supplement that is learnt under the Subject.

1. Explore Facebook, LinkedIn, Twitter, Video, Instagram, blog etc.
2. Explore Online Display Advertising, Ecommerce Marketing, Mobile Web and Content marketing.
3. Explore Email Marketing; Google AdWords and Google Analytics.
4. How to increase online presence and drive more traffic for a website.
5. Search result visibility in Google for chosen keywords and phrases.
6. Using e-mail marketing to drive traffic for a website.
7. Posting social media content for lead generation.
8. Tools to create and manage content.
9. Use of Blogging as a content strategy.
10. Show results for Search Engine Algorithms & Pagerank Technology
11. How to promote home page, SWOT Analysis of Website & finding right appropriate keywords.

Software Lab XIII (Based on Computer Graphics)

Subject Code: BGWDS1-407   **L T P C**   **Total Hours: 60 hrs.**
                                        0 0 4 2

This laboratory course will comprise exercises to supplement that is learnt under the Subject.

1. Use of basic functions of graphic available like circle, rectangle, arc, ellipse, flood fill, set color etc.
2. Design a logo/poster using primitive functions.
3. Draw a 3D object using palettes.
4. Line Drawing Algorithm: Direct method and DDA.
5. Bresenham's Line Drawing Algorithm
6. Bresenham's Circle Generating Algorithm.
7. Draw an ellipse using the Midpoint Algorithm.
8. Translation transformation on a polygon.
9. Scaling transformation on a polygon.
10. Rotation transformation on a polygon.
11. Shearing transformation on a polygon.
12. Minor project (eg Game/ Animation etc.)

Software Lab XIV (Based on Video Editing)

Subject Code: BGWDS1-408   **L T P C**   **Total Hours: 30 hrs.**
                                       0 0 2 1

This laboratory course will comprise exercises to supplement that is learnt under the Subject.

1. Assignment on creating one short video footage by using basic functions of the software
2. Assignment on designing a background, text and colors editing in video.
3. Assignment on editing a video by using a time in frames.
4. Assignment based on the mixing of 2 or more videos.
5. Assignment based on Audio equipment, Studio Production Techniques.
6. Assignment based on effects introduction, overview, compression.
7. Assignment based on Audio Formats- Digital and Analogue practical assignments and practice.
8. Assignment based on mastering setups – Monitoring the sound, background.
9. Assignment based on video editing by adding Voiceover.
10. Assignment based on voice modulation, voice synchronization.
11. Assignment based on design a soundtrack for a short film

5TH SEMESTER

MULTIMEDIA 2D & 3D DESIGNING

Subject Code- BGWDS1-501   **L T P C**   **Total Hours: 60 hrs.**

                                                    3 1 0 4

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Learn the tools and processes required to create simple animation of cartoons.	2	2	1	1	-	-	-	-
CO2	Create and animate any type of Graphic Design & cartoon in the software.	2	1	1	2	-	-	-	-
CO3	Gain knowledge about tools and interface of 2D & 3D animation software.	2	2	1	2	-	-	-	-
CO4	Learn about the mechanics of motion.	1	2	1	2	-	-	-	-

UNIT 1(14 Hrs.)

Introduction: An introduction of the various drawing and painting software tools and their uses and procedures. Working with timeline, key frames and frame rate. Shape Tween, Motion Tween and Symbols by using shape hints.

Bitmaps, Masks, Text and Special Effects:

Importing and modifying photos and bitmapped images.

UNIT II (15 Hrs.)

Character Animation and Inverse Kinematics Creating and animating armatures.

Sound, Layout and Final Production:

Importing sound files. Cuing and synchronizing sound with timeline animation. Lip Syncing to dialogue. Scene layout procedures and proper scene set up in preparation of final production.

UNIT III (17 Hrs.)

Character Animation: Explaining gestures, Role of expression, emotion in acting and animation. **Introductory exercises**: creativity, ideas, inspiration for stories, acting methods. Getting into character: Acting exercises that illustrate personality and character. Situations & character-driven scenarios. Focus on Shape, Postures, Gestures & key poses

UNIT IV (14 Hrs.)

Working with the recorded voice: Accents, dialects, mouth movements & facial expressions: characterization & performance choices dialogue in Animation. Introduction timing and spacing:

Directing skills, acting exercise, Timing for Acting how Timing is a very important principle for not only creating believable movements but also for creating more appealing in your animations.

Reference Books:

1. The Complete Digital Animation Course: The Principles, Practice and Techniques of Successful Digital Animation, Andy Wyatt, Thames & Hudson, 2010.
2. Cartoon Animation: (Collector's Series), Preston Blair, Walter Foster, 1994.

Subject Code- BGWDS1-502   **L T P C**   **Total Hours: 60 hrs.**

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Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Learn about the available lights in software for character designing.	2	2	1	1	-	-	-	-
CO2	Experiment with lighting using interior and exterior scenes.	1	1	1	2	-	-	-	-
CO3	Get a hand on experience of creating moods with lights.	2	2	1	2	-	-	-	-
CO4	Get clear idea of the rendering process of animation.	1	2	1	2	-	-	-	-

UNIT-I (14 Hrs.)

Fundamentals of Lighting Tools and light behavior: How light works in real world and difference between light in Real world & CG workspace. Introduction of light properties, moods.
Maya Shaders: Working with Shader - Working with Shader Properties - Ambient, Diffuse, Specular, Shininess etc.

UNIT-II (15 Hrs.)

Lighting in CG: Type of Light- Ambient Light, Directional Light, Point Light, Spotlight, Area Light, Volume light, Common attributes of lights- Type, Color, Intensity, Illuminates by Default, Emit Diffuse and Emit Specular,
Working with spotlight- Decay rate, working on Shadows, Depth Map and Retracing Shadows, Shadow Intensity and Color, Linking and Unlinking Lights.

UNIT-III (17 Hrs.)

Three Point light setup. Mental Ray Light- Mia photometric light, mia_physicalsun, mia_portal light etc. **Rendering:** Render Setup- Choosing a Filename, Image Format, Frame Range, Camera, Setting Resolution, selecting a Render Engine, Render Quality, Render View Window Saving /Loading an Image, Keeping/Removing Image.

UNIT-IV (14 Hrs.)

Introduction to Lighting, Mental Ray Physical Sun and Sky, Reflection and Refractions: Vector and Mental Ray, Mental Ray Settings, Global Illumination, Image Based Lighting, Mental Ray Physical Sun and Sky, Reflection and Refractions, Quality Settings- Sampling Mode, Number

of Samples, Anti- aliasing Contrast, Multi-Pixel Filtering Heading, Sample Options, Caustic sand Photons.

Reference Books:
1. Introducing Autodesk Maya 2014, Dariush Derakhshani, Wiley, 2013.
2. Mastering Autodesk Maya 2012, Todd Palamar, Wiley India Private Limited, 2011.

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SOCIAL MEDIA AND WEB ANALYTICS

Subject Code- BGWDS1-503   **L T P C**   **Total Hours: 45 hrs.**

3 0 0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Apply design principles and techniques to create visually appealing websites, graphics, and social media content.	2	2	1	1	-	-	-	-
CO2	Integrate social media strategies with web designing practices to optimize user engagement and brand visibility.	2	1	1	2	-	-	-	-
CO3	Analyze and evaluate the effectiveness of design strategies and social media campaigns using web analytics and metrics.	2	2	2	2	-	-	-	-
CO4	Integrate social media strategies with web design practices to enhance user engagement and brand visibility.	2	2	1	2	-	-	-	-

UNIT-I (9 Hrs.)

Introduction to social media marketing: platforms, strategies, trends, Content creation for social media: images, videos, info graphics, memes, Understanding audience behavior and preferences on social media

Social media analytics and metrics: measuring engagement, reach, and conversions.

UNIT-II (11 Hrs.)

Strategies for integrating social media elements into website design, Creating social media-friendly content and interfaces, Optimizing websites for social media sharing and engagement, Implementing social media sharing buttons, embedded feeds, and user-generated content

UNIT-III (13 Hrs.)

Introduction to web analytics tools: Google Analytics, social media insights Analyzing website traffic, user behavior, and social media engagement metrics, Evaluating the effectiveness of social media campaigns and design strategies, Using data-driven insights to optimize web design, content creation and social media marketing

UNIT-IV (12 Hrs.)

Applying graphic design principles to digital media: posters, banners, social media graphics Designing multimedia content for web and social media: animated GIFs, short videos, Techniques for visual storytelling and narrative design in digital marketing campaigns, Using typography and imagery effectively to convey brand messages and values

Reference Books:
1.   Williams, R. (2014). The Non-Designer's Design Book. Peachpit Press.
2.   Sponder, M. (2011). Social Media Analytics: Effective Tools for Building, Interpreting, and Using Metrics. McGraw-Hill Education.

SOFTWARE LAB XV (BASED ON MULTIMEDIA 2D & 3D DESIGNING LABORATORY)

Subject Code: BGWDS1-504   **L T P C**   **Total Hours: 60 hrs.**
0 0 4 2

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Learn about critical principles of animation like size and overlapping action.	2	2	1	1	-	-	-	-
CO2	Know about technical skills needed and support character animations for all 2D & 3D Animation.	2	1	1	2	-	-	-	-
CO3	Learn to animate the character the recorded voice in animation.	1	2	2	1	-	-	-	-
CO4	Learn about timing and spacing in animation	1	2	1	2	-	-	-	-

Instructions:

1. Assignment on adding life to characters using expressions.
2. Assignment on character eye movements, blinking, talking, and making various gestures.
3. Assignment on animate a character to depict a perfect normal human walk and run.
4. Assignment on human walk and run cycle with appropriate movement from head to toe.
5. Assignment on character to perform an action – Kicking a football - Jump over a small ditch/hole, climbing a wall – Opening a door, going out & then closing the door.
6. Assignment on character animation with perfect gestures, role of expression, emotion in acting.
7. Assignment on shape, Postures, Gestures & key poses of animation object.
8. Assignment on creating short animation scene by adding Accents, dialects, mouth movements & facial expressions.
9. Assignment on adding time frame keys in animation.
10. Assignment on creating design by mixing of Primary, Secondary and Tertiary Colors.
11. Assignment on text and as image combined with animate cartoons.

Reference Books:

1. Timing for Animation, Harold Whitaker, CRC Press, 2009
2. Basics Animation: Digital Animation, Andrew Chong, Bloomsbury Publishing India Private Limited, 2007

SOFTWARE LAB XVI (BASED ON LIGHTING AND RENDERING LABORATORY)

Subject Code: BGWDS1-505   **L T P C**   **Total Hours: 60 hrs.**
                                      0 0 4 2

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Gain the knowledge of using GI, FG, IBL, Raytraced reflections and refraction.	1	2	2	1	-	-	-	-
CO2	Learn about character designing and animation.	2	1	2	2	-	-	-	-
CO3	Learn about adding voice, songs and objects in the animation.	1	2	1	2	-	-	-	-
CO4	Know about the time and space in the animation.	1	2	1	2	-	-	-	-

Instructions

1. Assignment on lighting techniques in the animation.

2. Assignment on designing cartoon with hand and eye movements.

3. Assignment on Ambient & Diffuse animation.

4. Assignment on lights (Ambient Light, Directional Light, Point Light, Spot light, Area Light, Volume light)

5. Assignment on working with type of characters, Color & Intensity.

6. Assignment on animation by adding spot light- Decay rate, Cone Angle, Penumbra Angle, Drop-off, aiming lights.

7. Assignment on digital workflow (Digital black and white photography).

8. Assignment on Working on Shadows, Depth Map and Retracing Shadows.

9. Assignment on Lighting an Interior Scene.

10. Assignment on Render Setup with Image Format, Frame Range, Camera, Setting Resolution, Selecting a Render Engine, Render Quality.

Reference Books:

1. Advanced Maya Texturing and Lighting, Lee Lanier, Second Edition, Wiley Publishing Inc.

2. Exploring Autodesk Revit 2017 for Structure, Sham Tickoo/TIET, BPB publisher, 2017

SOFTWARE LAB XVII (BASED ON SOCIAL MEDIA AND WEB ANALYTICS LABORATORY)

Subject Code: BGWDS1-506   **L T P C**   **Total Hours: 60 hrs.**
                                       0 0 4 2

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Integrate Social Media Strategies with Web Design	1	2	2	1	-	-	-	-
CO2	Optimize Websites for social media and Search Engines	2	1	2	2	-	-	-	-
CO3	Create Visual Content for Social Media Campaigns	1	2	1	2	-	-	-	-
CO4	Analyze Social Media Metrics to Inform Design Decisions	1	2	1	2	-	-	-	-

Instructions

1. Design a website layout for a fictional brand or organization, integrating social media elements such as sharing buttons, embedded feeds, and user-generated content.
2. Identify trends, patterns, and insights to inform website design decisions and social media marketing strategies.
3. Creating Visual Content for Social Media Campaigns
4. Designing Social Media Content Calendar and Strategy
5. Design a visual analytics dashboard to monitor and track key performance indicators (KPIs) for social media and web analytics.
6. Create multiple versions of ad creatives (e.g., images, videos, carousel ads) for a social media advertising campaign.
7. Design a gamified experience to drive user engagement on social media platforms.
8. Develop a visual content strategy for a social media campaign targeting a specific audience segment.
9. Redesign a website to be fully responsive and optimized for social media integration.
10. Create a logo, color palette, typography, and visual elements that reflect the brand's values and personality.

Reference Books:

1. Content Strategy for the Web, Halvorson, K., & Rach, M,2012
2. The Non-Designer's Design Book, Williams, 2014

CYBER ATTACK

Subject Code- BGWDD1-511   **L T P C**   **Total Hours: 45 hrs.**
                              3 0 0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	To define cyber attack terminology and present various reports and trends.	2	2	1	1	-	-	-	-
CO2	To illustrate modus-operandi of well-known attacks and analyze their impacts.	2	1	1	2	-	-	-	-
CO3	To introduce ethical hacking and demonstrate assessment and testing practices.	2	2	1	2	-	1	-	-
CO4	To perform experimental analysis of various attack artifacts.	1	2	1	2	-	2	1	-

UNIT I (14 Hours)

Introduction: Cyber Threat, Definition of Cyber Crime, Classification, Current Threats and Trends, Diversity of Cyber Crime, Cyber Hate Crimes, Cyber Terrorism. Types of Cyber Attacks: Denial-of-service (DoS) and distributed denial-of-service (DDoS) attacks, Manin- the-middle (MitM) attack, Phishing and spear phishing attacks, Drive-by attack, Password attack, SQL injection attack, Cross-site scripting (XSS) attack, Zero-day exploit, Eavesdropping attack, Malware attack, DNS Tunneling.

UNIT II (11 Hours)

Ethical Hacking: Ethical Hacking Concepts and Scopes, Threats and Attack Vectors, Information Assurance, Threat Modelling, Enterprise Information Security Architecture, Vulnerability Assessment and Penetration Testing.

UNIT III (10 Hours)

Attack Artifacts: Virus, Worm, Trojan horse, Rootkits, Botnet, Social Engineering: Types of Social Engineering, Social Engineering Targets and Defence Strategies, Logic Bomb, Time Bomb.

UNIT IV (10 Hours)

Malware and Keylogger Analysis: Malware Analysis and Investigation – Introduction to Malware – Static Malware Analysis - Mobile Phone Hacking & Penetration Testing - Introduction of Keylogger: Art of Spying.

References Books:
1. Protecting National Infrastructure by Edward Amoroso. 2010.
2. Martti Lehto, Pekka Neittaanmäki. Cyber Security: Analytics, Technology and Automation edited, International Publishing Switzerland 2015.

SOFTWARE TESTING & QUALITY ASSURANCE

Subject Code- BGWDD1-512 **L T P C** **Total Hours: 45 hrs.**
3 0 0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Analyse different approaches to software testing and quality assurance	2	2	1	1	-	-	-	-
CO2	Analyse optimal solutions for different situations and projects.	1	2	1	2	-	-	-	-
CO3	Conduct independent research in software testing and quality assurance and apply that knowledge in their future research and practice.	2	2	1	2	-	1	-	-
CO4	Evaluate the work of peers constructively by following proven methods of peer-review, and by using the principles of research ethics.	1	2	1	2	-	1	2	-

Unit-I (10 Hrs.)

Testing Principles: Need of testing, Basic concepts–errors, faults, defects, failures, test bed, unit testing, integration testing system, system testing, regression testing, alpha, beta and acceptance testing, functional testing, performance testing, white box testing, black box testing, verification and validation

Unit-II (11 Hrs.)

Test Management: Testing Life Cycle–Roles and activities, Test Planning, Develop test plan review, Test Cases design strategies. Black box approach: random testing, equivalence class partitioning and boundary value analysis.

Unit-III (12 Hrs.)

Software Metrics: Scope of software metrics, Classifying software measures, Measurement basics – representational theory, scales, meaningfulness, What to measure–GOM technique, Control flow structure, product quality metrics – MTTF, defect density, customer problems, customer satisfaction, function point.

Unit- IV (12 Hrs.)

Quality Standards: Basic concept of–ISO 9000 & 9001, CMM, six sigmas. Development of CMMCMM–Following KPAs: requirements management (RM), software project tracking and oversight (SPTO), software configuration management (SCM), organization process definition (OPD), software product engineering (SPE), peer reviews (PR), quantitative process management (QPM), process change management.

Recommended Books:

1. Glenford J. Myers, ‗The Art Of Software Testing', 3rd Edn., Wiley,2015

ARTIFICIAL INTELLIGENCE

Subject Code- BGWDD1-513   **L T P C**   **Total Hours: 45 hrs.**
                                                          3 0 0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Understand the significance and domains of Artificial Intelligence and knowledge Representation.	2	2	1	1	-	-	-	-
CO2	Examine the useful search techniques; learn their advantages, disadvantages and Comparison.	2	1	1	2	-	1	-	1
CO3	Understand important concepts like Expert Systems, AI applications.	2	2	1	2	-	-	1	1
CO4	Be exposed to the role of AI in different areas like NLP, Pattern Recognition etc.	1	2	1	2	-	1	-	-

Unit-I (12 Hours)

Introduction: What is intelligence? Foundations of artificial intelligence (AI). History of AI. AI problems: Toy Problems, Real World problems- Tic-Tac-Toe, Water Jug, Question-Answering, 8-puzzle, 8-Queens problem. Formulating problems, searching for Solutions.

Knowledge Representation: Propositional Logic, Propositional Theorem Proving Inference and Proofs, Proof by Resolution, Horn Clauses and definite Clauses, Forward and Backward chaining; First order Logic, Inference in First Order Logic

Unit-II (11 Hours)

Uncertain Knowledge and Reasoning: Basic probability, Bayes rule, Belief networks, Default reasoning, Fuzzy sets and fuzzy logic.

Structured Knowledge: Associative Networks, Frame Structures, Conceptual Dependencies and Scripts.

Unit-III (12 Hours)

Uninformed Search strategies- Breadth-first search, Uniform-cost search, Depth-first search, Depth-limited search, Iterative deepening depth-first search, Bidirectional search, Comparing uninformed search strategies.

Informed (Heuristic) Search Strategies- Hill Climbing, Simulated Annealing, Genetic Algorithm, Greedy best-first search, A* and optimal search, Memory- bounded heuristic search.

Unit- IV (10 Hours)

Natural language processing: Grammars, Parsing.

Pattern Recognition: Recognition and Classification Process-Decision Theoretic Classification,

Syntactic Classification; Learning Classification Patterns, Recognizing and Understanding Speech.

Recommended Books:

1. Linux: The complete reference by Richard Petersen, Published by Tata McGraw-Hill Publication.

2. Linux in a Nutshell: A Desktop Quick Reference, 6th Edition by Stephen Figgins, Arnold Robbins, Ellen Siever & Robert Love Published by O'Reilly Media

** Guidelines regarding Mentoring and Professional Development

The objective of mentoring will be development of:

- Overall Personality
- Aptitude (Technical and General)
- General Awareness (Current Affairs and GK)
- Communication Skills
- Presentation Skills

The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are:

Part – A (Class Activities)

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

Part--B (Outdoor Activities)

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part – A & B Mentors/Faculty in charge shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

6TH SEMESTER

ANIMATION ART

Subject Code- BGWDS1-601   **L T P C**   **Total Hours: 60 hrs.**

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Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Learn the different mediums of Drawing and its importance for animation	3	1	3	1	-	-	-	-
CO2	Know about the different medium and techniques of drawing pencils and painting brushes.	3	1	3	2	1	1	-	-
CO3	Draw landscape with proper sketching sense, draw trees, plants, buildings, sky and to create the animation backgrounds.	3	1	2	1	1	1	-	-
CO4	Learn about the light and shadow and surface and texture sketching.	1	1	1	2	-	-	-	-

UNIT-I (17 Hrs.)

Introduction: Starting with the tools for drawing: Types of pencils:- (HB, B, 2B,4B, 6B,8B, 10B, 12B), Charcoal Pencil, Clutch Pencil. Sheets:-Cartridge, Hand Made, Ivory, Art Card, duplex, News Print, Mount board sheet etc. Colors:- Poster color, Water Color, Pastel color, Pencil Color, waterproof ink. Brushes:- Round and Flat.

Object Drawing: Principles of object drawing, Draw common shapes, forms on a Two Dimension (2D) surface with geometry - structure, surface and texture, perspective and points of view, Knowing about line and make effects that can build, definition of light and shadow on objects and an assignment.

UNIT-II (15 Hrs.)

Rendition of the effect of light on simple forms and objects mood changing, quality of surface, solidity, drama, and impact.

Viewpoint Drawing: Viewpoint Drawing. Theory of viewpoint, one point and two point perspective as applied to objects, furniture, interior and exteriors of the buildings, study of light and shade etc.

Unit–III (14 Hrs.)

Study of Living World: Drawing from Nature, Location drawing and learning to represent trees, plants, bushes, shrubs, insects, birds, and animals with attention to structure and morphology, proportion, volume, and behavior.

UNIT-IV (14 Hrs.)

Human Creativity: Explanation to human figure drawing –Drawings from Mannequin, Sketching of person figure from outside as well as inside. To know and catch the signs of the human form, weight, balance, Rhythm and proportion.

Making Storyboard What is storyboard, usage of story board, drawing on storyboard, understand and draw movements of camera in story board.

Reference Books:

1. The Complete Book of Drawing Techniques: A Complete Guide for the Artist, Peter Stanyer, Arcturus Publishing, 2004.

2. Drawing for the Absolute and Utter Beginner, Watson- Guptill, 2018.

<div style="background:yellow">**MOTION GRAPHICS & COMPOSITING**</div>

Subject Code- BGWDS1-602　　　　**L T P C**　　　**Total Hours: 60 hrs.**
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Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Learn the practical knowledge about broadcasting methods used in industry.	3	3	2	1	1	1	-	-
CO2	Learn the fundamentals of motion graphics and television related animations.	2	2	1	1	-	3	-	-
CO3	Animate the videos with effects.	3	3	3	1	1	1	3	-
CO4	Learn about Motion Graphics in detail.	2	2	3	1	-	-	-	-

UNIT-I (14 Hrs.)

Introduction to Motion Graphics: Briefing about compositing and its basic fundamentals. A round-up of broadcast design concepts, looking at specific examples of teasers, promos, typography, openers and pack shots. Introduction to Motion graphics and Principles of Motion Graphics. Workflow for creating motion graphics.

Introduction to Adobe after Effects: Basics of GUI and related terminologies, Managing and setting up workspace. Different file formats. Using project panel, Footage, Composition, Timeline, Effects and Presets. Importing and Organizing footages and files, Using Ram preview for playback.

UNIT-II (15 Hrs.)

Compositions and Layers: Creating, saving and back up of projects. Broadcasting fundamentals, Pixel aspect ratios, frame rates and various terminologies behind broadcasting. Trimming, Splitting and concept of in and out points. Layer stacks, modes and switches. Shape layers and solid layers. Mask and transparent layers. Pre-composing, nesting, and Pre-rendering.

Layer effects: Using color depth and HDR colors. Color correction and color adjustment. Color Management, color profiles and broadcast safe colors. Using layer markers, composition markers and XMP metadata. Using 3D layers and coordinate systems in Adobe after Effects. Light Layer, Null Layer and Adjustment Layer.

UNIT-III (17 Hrs.)

Animation and Dynamics: Animation basics in after effects. Introduction to graph editor. Applying, selecting, editing, moving, copying and deleting keyframes. Animating objects with Motion paths, motion blur and smoothing animation. Adding Randomness to key values. Learning Interpolation types like Linear, Bezier and Auto Bezier, Continuous Bezier Interpolation and Hold Interpolation. Controlling speed of the animation. Using time remapping and frame blending. Animating footage using Expressions.

UNIT-IV (14 Hrs.)

Audio and Transitions: Fundamentals of Audio. Technical terminologies related to audio and Sound. Using Audio files, Synchronizing and editing audio, Controlling Pitch and Temp, Adding effects like Echo, Reverb etc. Separating Bass and Treble and Audio equalizing.

Rendering: Fundamentals of rendering and exporting, Using Render Queue. Using proxies. Exporting still images and sequences. Learning output formats, codec, compression ratios and other terminologies related to rendering. Converting footages from NTSC to Pal. Using Pull down.

Reference Books:
1. Broadcast Graphics on the Spot, Richard Harrington, Routledge, 1 Edition, 2017.
2. Adobe after Effects CC Classroom in a Book, Lisa Fridsma, Pearson Education, 1st edition, 2018. Emails and Transactional Emails, Drawbacks of Email Marketing.

INTRODUCTION TO GAMING

Subject Code- BGWDS1-603   **L T P C**   **Total Hours: 60 hrs.**
                                       3 1 0 4

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Know the entire development process from a concept to a final playable game, in an easier and simulated environment.	1	3	2	1	1	3	1	-
CO2	Know about video games, their various forms and the career options available within.	1	1	1	2	1	1	-	-
CO3	Know practically dabble in making small video games and get real-time experience of game development and create small playable segments of a game.	3	2	2	1	1	1	1	-
CO4	Know the electronic game design and development careers	1	1	2	2	3	1	-	-

Unit-I (14 hours)

Introduction to Gaming: Introduction to gaming. The definitions of "Game". History, current affairs, popular titles of today, etc. Different Genres of gaming. Different platforms where games exist and how they differ.

Unit-II (15 hours)

Gaming Roles: Different roles that exist in Game Development. Some on Programming for games. A general overview of what fields exits inside programming for games and how, they differ.

Unit-III (17 hours)

Different theories of Game Designing: An introduction to different theories of fun and flow (Extremely basic to let them know there is a LOT to study about). Level Design: Various approaches: A description of different ways studios makes levels and real life examples of level design from Theme parks: a roller-coaster ride and a Disneyland "Haunted Mansion" to illustrate a level.

Unit-IV (14 hours)

Game Level designing in build Box: A case study of a popular game by the faculty to practically showcase all the concepts of game design and Elements that constitutes a game.

Reference Books:

1. Level Up! The Guide to Great Video Game Design, Scott Rogers John Wiley & Sons; 2nd edition, 2014

2. The Art of Game Design: A Book of Lenses, Jesse Schell, A K Peters/CRC Press, 2edition, 2014

SOFTWARE LAB XVIII (BASED ON ANIMATION ART)

Subject Code- BGWDS1-604   **L T P C**   **Total Hours: 60 hrs.**
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Course Outcomes (Cos) and mapping with program outcomes (POs)

Cos	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Create basic shapes and forms on a two-dimensional surface using geometry	3	2	2	1	1	1	-	-
CO2	Learn observation, visualization and visually experiencing the content.	2	1	3	1	1	1	-	-
CO3	Study about human figure for character drawing	3	3	3	1	-	-	-	-
CO4	Develop skills in digital drawing and animation techniques, including keyframing, tweening, rigging, and character animation.	1	2	1	1	1	1	1	1

Instructions:
1. Assignment on sketching by using Drawing pencils:- (HB, B, 2B,4B, 6B,8B, 10B, 12B), Charcoal Pencil, Clutch Pencil.
2. Assignment on drawing scenery by using colors (poster color, Water Color, Pastel color, Pencil Color, waterproof ink).
3. Assignment on poster designs with shades by using sheets (Cartridge, Hand Made, Ivory, Art Card, duplex, News Print, Mount board sheet etc.).
4. Assignment on Round and Flat brush painting.
5. Assignment on design based on geometry - structure, surface and texture.
6. Assignment on light and shadow on objects and an assignment.
7. Assignment on design based on objects mood changing, quality of surface, solidity, drama, and impact.
8. Assignment on one point and two point perspective.
9. Assignment on furniture, interior and exteriors of the buildings Designs.
10. Assignment on drawing Nature & Location scene.
11. Assignment on Design based on light and shade of the pencils and brushes.

Reference books:

1. Sketching for Animation: Developing Ideas, Characters and Layouts in Your Sketchbook, Peter

Parr, Fairchild Books, 2016.

SOFTWARE LAB XIX (BASED ON MOTION GRAPHICS & COMPOSITING)

Subject Code- BGWDS1-605   **L T P C**   **Total Hours: 60 hrs.**
                                       0 0 4 2

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Learn about the color keying, tracking and the Effects panel in After effects.	2	3	3	1	1	1	-	-
CO2	Learn about the color keying, tracking and the Effects panel in After effects.	2	3	3	1	1	1	-	-
CO3	Edit or create animation, dynamics and composition for visual effects.	1	2	2	1	1	1	-	-
CO4	Know about audio and rendering after implementation of visual effects on footage	1	2	3	1	1	2	1	1

Instructions:
1. Assignment on A round-up of broadcast design concepts.
2. Assignment on designing teasers, promos, typography, openers and pack shots with motion effects
3. Assignment on short logo motion video using project panel.
4. Assignment on motion video of poster using Footage, Composition, Timeline, Effects and Presets.
5. Assignment on workflow for creating motion graphics.
6. Assignment on editing video with managing and setting up workspace.
7. Assignment on combining different motion effects together (text effect & background).
8. Assignment on one point and two point perspective.
9. Assignment on project panel, Footage, Composition, Timeline, Effects and Presets.
10. Assignment on editing short text motion video with layer effect (by using color depth and HDR colors)

Reference Book:
1. Motion Graphics with Adobe Creative Suite 5 Studio Techniques, Richard Harrington, Adobe Press; 1 edition, 2010.

SOFTWARE LAB XX (BASED ON INTRODUCTION TO GAMING)

Subject Code- BGWDS1-606   **L T P C**   **Total Hours: 60 hrs.**
                                  0 0 4 2

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO 1	Learn the elements of game mechanics	1	3	2	1	1	3	1	-
CO 2	Know about game testing.	1	1	1	2	1	1	-	-
CO 3	Know about the entire game designing process from the concept to final playable game.	3	2	2	1	1	1	1	-
CO 4	Know about Game Assets Development, efficient Import/ Export of assets for Games.	1	1	2	2	3	1	-	-

Instructions:

1. Assignment on creating Gaming background by adding background.
2. Assignment on theme based character visualization design.
3. Assignment on designing realistic, Semi Realistic cartoons.
4. Assignment on designing the gaming props, weapons and accessories according to the theme.
5. Assignment on game theme and creating game map according to scene.
6. Assignment based on layout designing, creating illustrations for levels.
7. Assignment based on Audio Formats- Digital and Analogue practical assignments and practice.
8. Assignment on Game Environment design.
9. Assignment based on creating architecture stuff based on the theme of the game.
10. Assignment based on compiling the scene of the game.

Reference Book:

1. Creating 3D Game Art for the iPhone with Unity: Featuring modo and Blender pipelines, Wes McDermott, Routledge, 1 edition, 2010

CYBER FORENSICS

Subject Code- BGWDD1-611   **L T P C**   **Total Hours: 45 hrs.**
                                        3 0 0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Understand the fundamentals of Cyber-crimes and analyze its impact on the society.	1	3	1	2	1	3	3	2
CO2	Examine the evidence collected and apply it for the reconstruction of past events.	1	1	3	2	2	2	3	1
CO3	Understand the legal and ethical aspects of Cyber-crimes.	1	3	1	2	1	3	3	2
CO4	Design and develop a security architecture for an organization.	2	2	3	1	2	3	3	2

UNIT I (10 Hours)

Overview of Cyber Crime: Nature and Scope of Cyber Crime, Types of Cyber Crime, Introduction to Cyber forensics: Information Security Investigations, Corporate Cyber Forensics, Scientific method in forensic analysis, investigating large scale Data breach cases. Analyzing malicious software.

UNIT II (12 Hours)

Types of Computer Forensics Systems: Internet Security Systems, Intrusion Detection Systems, Firewall Security Systems, Storage Area Network Security Systems, Network Disaster Recovery Systems, Public Key Infrastructure Systems, Wireless Network Security Systems, Satellite Encryption Security Systems, Instant Messaging (IM) Security Systems, Net Privacy Systems, Identity Management Security Systems, Identity Theft, Biometric Security Systems.

UNIT III (14 Hours)

Ethical Hacking: Essential Terminology, Windows Hacking, Malware, Scanning, Cracking. Digital Evidence in Criminal Investigations: The Analog and Digital World, Training and Education in digital Ethical Hacking: Essential Terminology, Windows Hacking, Malware, Scanning, Cracking. Digital Evidence in Criminal Investigations: The Analog and Digital World, Training and Education in digital evidence, Evidence Collection and Data Seizure: Why Collect Evidence, Collection Options Obstacles, Types of Evidence, The Rules of Evidence, Volatile Evidence, General Procedure, Collection and Archiving, Methods of Collection, Artifacts.

UNIT IV (9 Hours)

Identification of Data: Timekeeping, Forensic Identification and Analysis of Technical Surveillance Devices, Reconstructing Past Events: How to Become a Digital Detective, Useable

File Formats, Unusable File Formats, Converting Files, Investigating Network Intrusions and Cyber Crime, Network Forensics and Investigating logs, Investigating network Traffic, Investigating Web attacks, Router Forensics. Cyber forensics tools and case studies.

Reference Books:
1. John R VACCA, Computer Forensics: Computer Crime Scene Investigation, Firewall Media, 2009 edition Reprint 2012.
2. Bill Nelson, Amelia Phillips, Christopher Stuart Cengage, Guide to Computer Forensics and Investigations, Learning publications, latest edition.

MACHINE LEARNING

Subject Code- BGWDD1-612   **L T P C**   **Total Hours: 45 hrs.**
                                 3 0 0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8
CO1	Know about the Learning methodologies of Artificial Neural Networks	2	3	3	1	2	3	-	-
CO2	Learn the concept of clustering	2	2	3	1	1	2	-	-
CO3	Differentiate supervised and unsupervised learning	2	2	2	1	1	1	1	-
CO4	Understand the concept of Reinforcement learning	1	1	2	2	-	-	-	-

Unit-I (8 Hours)

Introduction: What is Machine Learning, Unsupervised Learning, Reinforcement Learning Machine Learning Use-Cases, Machine Learning Process Flow, Machine Learning Categories, Linear regression and Gradient descent.

Unit-II (14 Hours)

Supervised Learning: Classification and its use cases, Decision Tree, Algorithm for Decision **Tree Induction:** Creating a Perfect Decision Tree, Confusion Matrix, Random Forest. What is Naïve Bayes, How Naïve Bayes works, Implementing Naïve Bayes Classifier, Support Vector Machine, Illustration how Support Vector Machine works, Hyper parameter Optimization, Grid Search Vs Random Search, Implementation of Support Vector Machine for Classification.

Unit-III (11 Hours)

Clustering What is Clustering & its Use Cases, K-means Clustering, How Kmeans algorithm works, C-means Clustering, Hierarchical Clustering, How Hierarchical Clustering works.

Unit- IV (12 Hours)

Why Reinforcement Learning, Elements of Reinforcement Learning, Exploration vs Exploitation dilemma, Epsilon Greedy Algorithm, Markov Decision Process (MDP) Q values and V values, Q – Learning, α values.

Recommended Books:
1. Pattern Reorganization and Machine learning by Christopher M. Bishop.
2. The elements of Statistical learning by Jeromeh. Friedman, Robert Tivshirani and Trevorhaspie.
3. Introduction to Machine Learning by Ethem Alpaydin. PHI Publisher.

SOFTWARE ARCHITECTURAL & DESIGN PATTERN

Subject Code- BGWDD1-613　　　**L T P C**　　　　　**Total Hours: 45 hrs.**
　　　　　　　　　　　　　　　　　　　　　3　0　0 3

Course Outcomes (Cos) and mapping with program outcomes (POs)

COs	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	Design and implement codes with higher performance and lower complexity.	2	2	2	1	1	-	-	-
CO2	Be aware of code qualities needed to keep code flexible	2	3	3	1	1	1	3	-
CO3	Capable of applying these principles in the design of object-oriented systems.	2	3	2	1	1	2	-	-
CO4	Demonstrate an understanding of a range of design patterns.	2	3	2	1	1	2	2	-

Unit-I (12 Hours)

Introduction: Introduction to design pattern, describing design patterns, the catalog of design pattern, organizing the catalog, how design patterns solve design problems, how to select a design pattern, how to use a design pattern. object-oriented development, key concepts of object-oriented design, other related concepts, benefits and drawbacks of the paradigm.

Unit-III (11 Hours)

Analysis a System: Overview of the analysis phase, stage 1: gathering the requirements functional requirements specification, defining conceptual classes and relationships, using the knowledge of the domain. Design and Implementation, discussions and further reading.

Unit- III (13 Hours)

Interactive systems and the MVC architecture: Introduction, The MVC architectural pattern, analyzing a simple drawing program , designing the system, designing of the subsystems, getting into implementation, implementing undo operation , drawing incomplete items, adding a new feature , pattern based solutions.

Unit- IV (9 Hours)

Designing with Distributed Objects: Client server system, java remote method invocation, implementing an object-oriented system on the web (discussions and further reading) a note on input and output, selection statements, loops arrays.

Recommended Books:

1. Object-oriented analysis, design and implementation, brahma dathan, sarnath rammath, universities press, 2013
2. Design patterns, erich gamma, Richard helan, Ralph johman, john vlissides, PEARSON Publication, 2013

** Guidelines regarding Mentoring and Professional Development

The objective of mentoring will be development of:
• Overall Personality
• Aptitude (Technical and General)
• General Awareness (Current Affairs and GK)
• Communication Skills
• Presentation Skills

The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are:

Part – A (Class Activities)
1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises Part
– B (Outdoor
Activities)
1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part – A & B Mentors/Faculty in charge shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.