Detailed Syllabus for

Bachelor of Science (Graphics & Animation)

(Three Years Full Time Undergraduate Degree Programme)
Effective from July 2020

Department of New Media Technology
MAKHANLAL CHATURVEDI NATIONAL UNIVERSITY OF JOURNALISM
& COMMUNICATION, BHOPAL
B-38, Press Complex, Zone -1, M.P. Nagar, Bhopal (M.P.)-462011

Bachelor of Science (Graphics & Animation): B.Sc. (GA)

1. ABOUT THE PROGRAMME:

B.Sc. (Graphics & Animation) is a Three year (Six Semesters) Undergraduate programme that prepares a Student to work for the Digital Media industry as a creator of Graphics and Animation content, while working on convergence of elements like Text, Graphics, Audio, Video and Animation.

The programme has compulsory and elective core courses including Aesthetics and Technicality of Design, Foundational Components of Multimedia, Editing of Image, Audio and Video, 2D & 3D Animation, Color Theory & Color Composition, Game Design, Video Editing, Augmented and Virtual Reality, 3D Design with MAX, 3D Design with MAYA, Visual Effects, Animation for New Media, and UI/UX Design in addition to other courses. The Skill enhancement courses include Graphics Design, Visual Communication & Media, Graphics Design for Gaming, Design and Business Management. The Ability Enhancement Compulsory Courses are given as per UGC specification. The Open Elective (OE) courses offered include Word Processing and Presentation for Multimedia, Digital Content Production, Character Animation, Advertising for New Media, Data Analytics for Journalism, Social Media Analytics, whereas the student is free to choose One Open Elective per semester from the pool of Open Elective offered by various Departments of the University.

This programme is highly recommended for students who are creative and focused to upgrade their skill set for Graphics and Animation content creation. The content developed helps better understanding and improved human communication in day to day life, at professional and personal space.

2. ELIGIBILITY: The eligibility for 3-Year B.Sc. (GA) programme is 10+2 level from a recognized board.

3. CAREER AVENUES:

The major areas where one could plan a career through this programme are: Graphics Design, Animation Industry, Digital Media, Advertising, Entertainment Industry, Fashion and Interior designing, Publishing Industry, E-learning, Cartoon Production, Visual content creation, Digital Marketing and many more.

4. PROGRAMME OBJECTIVES (PO):

The B.Sc. (GA) programme is designed with the following educational objectives:

   i.   To inculcate Art, Aesthetics and Technology of Graphics and Animation elements in Students.

  ii.   To equip the Students with skills for Digital Media Content Development, ranging from Graphics Design for Gaming to Advertising for New Media.

 iii.   To make the Students understand the theoretical aspects of Graphics and Animation and develop the practical ability for Content creation, Editing and Visual Effects.

 iv.   To empower the Students to work as trained professional for Online Platforms, with the capability of Social Media Analytics.

  v.   To prepare the Students to become, Entrepreneur creating Employability, Professional with Media Ethics and Researcher questing for New Dimensions of Societal issues.

5. PROGRAMME EDUCATIONAL OUTCOMES (PEO):

On successful completion of B.Sc. (GA), Students shall be able to

   i.   Understand and identify the requirements of various Graphics and Animation elements for a given task.

  ii.   Demonstrate Skills in Designing, and Developing Graphics and Animation Content for Digital Media.

 iii.   Develop competence in understanding the theoretical aspects and choose appropriate platform for implementing any given concept.

 iv.   Analytically explore the Social Media Content in different platforms.

  v.   Demonstrate Skills to distinguish between work responsibility and accountability in Digital Media Platforms, as an Entrepreneur and an Individual.

Makhanlal Chaturvedi National University of Journalism & Communication
(Department of New Media Technology)
B.Sc. (Graphics & Animation)

	Course	Core Course (Compulsory) (CCC) (6Credits)	Core Course (Elective) (CCE) (6 Credits)	Ability Enhancement Compulsory Course (AECC) (3 Credits)	Skill Enhancement Course (SEC) Elective (3 Credits)	Open Elective (3 Credits)	Total Credits
SEM 1	**1CCC-1**	Principles of Art & Design		**1AECC-1** Communicative English		(Any one in Each semester From Pool of OE)	24
	1CCC-2	Fundamentals of Multimedia					
	1CCC-3	Basics of Communication					
SEM II	**2CCC-4**	Digital Photography		**2AECC-2** Environmental Studies		(Any one in Each semester From Pool of OE)	24
	2CCC-5	Basic Mathematics					
	2CCC-6	Layout Design					
SEM III	**3CCC-7**	Audio Editing	**3CCE-1** Website Design OR **3CCE-2** Design Concept & Technology		**3SEC-1** Graphics Design	(Any one in Each semester From Pool of OE)	24
	3CCC-8	Script Writing & Storyboarding					
SEM 1V	**4CCC-9**	Color Theory & Color Composition	**4CCE-3** Game Design OR **4CCE-4** Video Editing		**4SEC-2** Visual Communication & Media	(Any one in Each semester From Pool of OE)	24
	4CCC-10	2D Animation					
SEM V	**5CCC-11**	Augmented and Virtual Reality	**5CCE-5** 3D Design with MAX OR **5CCE-6** 3D Design with MAYA		**5SEC-3** Graphics Design for Gaming	(Any one in Each semester From Pool of OE)	24
	5CCC-12	Visual Effects					
SEM V1	**6CCC-13**	Portfolio Management	**6CCE-7** Animation for New Media OR **6CCE-8** UI/UX Design		**6SEC-4** Design and Business Management	(Any one in Each semester From Pool of OE)	24
	6CCC-14	Project					
Total Credits		84	24	6	12	18	144

	Open Elective Courses offered by Department of New Media Technology
OE-1	Word Processing and Presentation for Multimedia
OE-2	Digital Content Production
OE-3	Character Animation
OE-4	Advertising for New Media
OE-5	Data Analytics for Journalism
OE-6	Social Media Analytics

CCC   -   Core Course Compulsory (CCC) (6 Credits Each)
CCE   -   Core Course Elective (CCE) (6 Credits Each, Any One)
AECC -   Ability Enhancement Compulsory Course (AECC) (3 Credits Each)
SEC   -   Skill Enhancement Course (SEC) (3 Credits Each)
OE   -   Open Elective (3 Credits Each, Any One)

Programme Structure

Semester – 1

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	1CCC-1	1 BSc (GA) 1	Principles of Art & Design	6	50	30	20	100
2	1CCC-2	1 BSc (GA) 2	Fundamentals of Multimedia	6	80	-	20	100
3	1CCC-3	1 BSc (GA) 3	Basics of Communication	6	80	-	20	100
4	1AECC-1	1 BSc (GA) 4	Communicative English	3	40	-	10	50
5	OE-1	1 BSc (GA) 5	Select any one Course from Open Elective	3	-	40	10	50

Semester – 2

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	2CCC-4	2 BSc (GA) 1	Digital Photography	6	50	30	20	100
2	2CCC-5	2 BSc (GA) 2	Basic Mathematics	6	80	-	20	100
3	2CCC-6	2 BSc (GA) 3	Layout Design	6	50	30	20	100
4	2AECC-2	2 BSc (GA) 4	Environmental Studies	3	40	-	10	50
5	OE-2	2 BSc (GA) 5	Select any one Course from Open Elective	3	-	40	10	50

Semester – 3

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	3CCC-7	3 BSc (GA) 1	Audio Editing	6	50	30	20	100
2	3CCC-8	3 BSc (GA) 2	Script Writing &Storyboarding	6	80	-	20	100
3	3CCE-1	3 BSc (GA) 3	A. Website Design OR	6	50	30	20	100
	3CCE -2		B. Design Concept and Technology	6	50	30	20	100
4	3SEC-1	3 BSc (GA) 4	Graphics Design	3	-	40	10	50
5	OE-3	3 BSc (GA) 5	Select any one Course from Open Elective	3	-	40	10	50

Semester – 4

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	4CCC-9	4 BSc (GA) 1	Color Theory & Color Composition	6	50	30	20	100
2	4CCC-10	4 BSc (GA) 2	2D Animation	6	50	30	20	100
3	4CCE -3	4 BSc (GA) 3	A. Game Design OR	6	80	-	20	100
	4CCE -4		B. Video Editing	6	50	30	20	100
4	4SEC-2	4 BSc (GA) 4	Visual Communication & Media	3	-	40	10	50
5	OE-4	4 BSc (GA) 5	Select any one Course from Open Elective	3	-	40	10	50

Semester – 5

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	5CCC-11	5 BSc (GA) 1	Augmented and Virtual Reality	6	50	30	20	100
2	5CCC-12	5 BSc (GA) 2	Visual Effects	6	50	30	20	100
3	5CCE -5	5 BSc (GA) 3	A. 3D Design with MAX OR	6	50	30	20	100
	5CCE -6		B. 3D Design with MAYA	6	50	30	20	100
4	5SEC-3	5 BSc (GA) 4	Graphics Design for Gaming	3	-	40	10	50
5	OE-5	5 BSc (GA) 5	Select any one Course from Open Elective	3	-	40	10	50

Semester – 6

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	6CCC-13	6 BSc (GA) 1	Portfolio Management	6	50	30	20	100
2	6CCC-14	6 BSc (GA) 2	Project	6	-	80	20	100
3	6CCE -7	6 BSc (GA) 3	A. Animation for New Media OR	6	50	30	20	100
	6CCE -8		B. UI/UX Design	6	50	30	20	100
4	6SEC-4	6 BSc (GA) 4	Design and Business Management	3	40	-	10	50
5	OE-6	6 BSc (GA) 5	Select any one Course from Open Elective	3	-	40	10	50

Open Electives

S. No	Course	Course ID	Course Name	Credit	Marks			
					Th.	P.	IA	Total
1	OE-1	1BSc (GA) 5	Word Processing and Presentation for Multimedia	3	-	40	10	50
2	OE-2	2 BSc (GA) 5	Digital Content Production	3	-	40	10	50
3	OE-3	3BSc (GA) 5	Character Animation	3	-	40	10	50
4	OE-4	4BSc (GA) 5	Advertising for New Media	3	-	40	10	50
5	OE-5	5BSc (GA) 5	Data Analytics for Journalism	3	-	40	10	50
6	OE-6	6BSc (GA) 5	Social Media Analytics	3	-	40	10	50

B.Sc. (GA) Programme Education Outcome(PEOs)/ Programme Graduate Aptitude (PO):														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
PE01	3	3	3	3	3	2	2	2	3	3	2	2	1	1	2
PE02	3	3	3	3	3	2	2	3	3	3	3	2	2	3	3
PE03	3	3	3	3	3	2	2	3	3	3	2	2	3	2	3
PE04	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3
PE05	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Programme Graduate Aptitude (PO):

PO1 Disciplinary Knowledge   PO2 Communication Skills   PO3   Critical Thinking
PO4 Problem Solving   PO5 Analytical Reasoning   PO6   Research Related Skills
PO7 Cooperation/Team Work   PO8 Scientific Reasoning   PO9   Reflective Thinking
PO10 Information /Digital Literacy PO11 Self-Directed Learning   PO12 Multicultural Competence
PO13 Moral and Ethical Awareness/Reasoning   PO14 Leadership
Readiness/Qualities   PO15 Lifelong Learning

Mapping Value: 3-Strong 2- Moderate 1-Weak

PO1: Disciplinary Knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

PO2: Communication Skills: Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.

PO3: Critical Thinking: Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.

PO4: Problem Solving: Capacity to extrapolate from what one has learned and applies their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.

PO5: Analytical Reasoning: Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyse and synthesise data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.

PO6: Research Related Skills: A sense of inquiry and capability for asking relevant/appropriate questions, problematising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation.

PO7: Cooperation/Team Work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.

PO8: Scientific Reasoning: Ability to analyse interprets and draws conclusions from quantitative/qualitative data; and critically evaluates ideas, evidence and experiences LOCF 4 from an open-minded and reasoned perspective.

PO9: Reflective Thinking: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.

PO10: Information/Digital Literacy: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO11: Self-Directed Learning: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

PO12: Multicultural Competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.

PO13: Moral and Ethical Awareness/Reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstrating the ability to identify ethical issues related to

one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

PO14: Leadership Readiness/Qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.

PO15: Lifelong Learning: Ability to acquire knowledge and skills, including "learning how to learn", that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.

1 B.Sc. (GA) 1
1CCC-1: Principles of Art and Design

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES
1. To understand the basic of art, drawing & sketching
2. Use drawing for observation, recording and analysis, as a means of thinking and for communication and expression
3. To develop a sense of personal identity and self-esteem through practical achievement in the expressive
4. To develop elements of design in works of art
5. To develop the artistic skills within students

COURSE OUTCOMES (CO)
1. Demonstrate drawing and transforming objects
2. Students learn how to use the tools to create digital artwork
3. The evaluate in Drawing, two-dimensional Art, Craft and Design
4. To promote in the student a practical understanding of and competence in the principles and skills underlying visual
5. Demonstrate knowledge of Adobe Illustrator through a variety of skill-based activities

UNIT-1	Basics of Art	L	T	P
1.1	Definition and concept of Art, History of Art and Utility (Lecture, Practical, Demonstration)	**2**	**-**	**1**
1.2	Visual and Performing Art (Lecture, Practical, Demonstration)	**1**	**2**	**1**
1.3	Elements of Art : Point, Line, Curve (Lecture, Practical, Demonstration)	**2**	**1**	**-**
1.4	Form, Colour, Texture Tone, Space, Proportion Colour Theory, Colour Wheel (Lecture, Practical, Demonstration)	**2**	**1**	**2**
1.5	Principles of Art : Unity, Rhythm, Harmony, balance, Perspective (Lecture, Practical)	**2**	**-**	**1**

UNIT-2	Types of Art	L	T	P
2.1	Calligraphy, Typography, Poster, Layout (Lecture, Practical, Demonstration)	2	-	1
2.2	Press and Magazine, Logo, Monogram Hording (Lecture, Practical)	1	2	1
2.3	Aesthetic, Shading, Object drawing, Human Anatomy, Memory drawing, Model drawing (Lecture, Demonstration)	2	1	1
2.4	Caricature: Definition and examples, cartoonists in India Definition of Cartoon (Lecture, Demonstration)	2	1	1
2.5	Types of Cartoons, Cartoon Characters, Utility of Cartoons Face expression. Traditional Art Forms (Lecture, Practical)	2	-	1

UNIT-3	Techniques of Drawing	L	T	P
3.1	Definition, Techniques, Area of application, Tools used for Drawing (Lecture, Practical, Demonstration)	2	-	1
3.2	Pencil Tool: Importance, use etc (Lecture, Practical, Demonstration)	1	2	1
3.3	Difference between a photograph and pencil drawing (Lecture, Practical, Demonstration)	2	1	-
3.4	Mediums of drawing: Pencils, Wax Colour, Water Colours (Lecture, Demonstration)	2	1	2
3.5	Themes of Cartoons - Oil Paint, Portrait, landscape composition (Lecture, Demonstration)	2	-	1

UNIT-4	Sketching	L	T	P
4.1	Definition, Types of sketches, Area of application (Lecture, Practical, Demonstration)	2	-	1
4.2	Tools used for sketching, Features of real Photograph and sketching (Lecture, Practical)	1	2	1
4.3	Sketching: Practical steps, Use of Colours and shades (Lecture, Practical)	2	1	1
4.4	Converting techniques of photographs to sketches (Lecture, Demonstration)	2	1	1

4.5	software used for sketching, Preparation of pocket cartoons and strips (Lecture, Demonstration)	2	-	1

UNIT-5	Adobe Illustrator	L	T	P
5.1	Introduction, Vector Graphics, Interface - Menu, Tool bar (Lecture, Practical)	2	-	1
5.2	Option Bar, Palettes layer, Path and Anchor points (Lecture, Practical, Demonstration)	1	2	1
5.3	Curve Path, Crating Text, Text around the picture (Lecture, Practical, Demonstration)	2	1	1
5.4	Importing and placing graph; background border (Lecture, Demonstration)	2	-	1
5.5	Implementing Colours, File formats. Prevention (Lecture, Demonstration)	2	1	1

Practical / Projects/Assignments:
1. Presentation on drawing, and sketching
2. Performing art work using digital software
3. Create graphics using Adobe Illustrator
4. Calligraphy writing
5. Object drawing with shading

Suggested Readings:
1. The Design of Everyday Things: Revised and Expanded Edition: Nov 2013, Don Norman
2. Barnet, S. A Short Guide to Writing About Art, New York: Harper Collins Publishers, 1993
3. Boxer, D. and Poupeye, V. Modern Jamaican Art, Kingston: Ian Randle Publishers, 1998
4. Cummings, A., Thompson, A. and Whittle, N. Art in Barbados, Kingston: Ian Randle Publishers, 1998
5. The principles of art- by Robin George Collingwood
6. Elements of Art by Jane Castillo.
7. Adobe Illustrator Bible
8. Anatomy & Drawing by Victor Perard

E- Resources:
1. Principles of Art accessed at http://learn.leighcotnoir.com/artspeak/principles/
2. How to do Modern Calligraphy accessed at https://www.lettering-daily.com/modern-calligraphy/
3. Art techniques accessed at https://www.creativebloq.com/features/art-techniques
4. How to draw accessed at https://www.creativebloq.com/features/how-to-draw-animals-people-landscapes
5. Sketching Tutorials accessed at https://www.tutorialspoint.com/sketching/index.htm
6. How to Sketch accessed at https://rapidfireart.com/2017/04/06/lesson-1-how-to-sketch/
7. Adobe Illustrator Tutorial accessed at https://www.javatpoint.com/adobe-illustrator
8. View all Adobe Illustrator tutorials accessed at https://helpx.adobe.com/illustrator/view-all-tutorials.html

1 B.Sc. (GA) 2
1CCC-2: Fundamentals of Multimedia

Theory	80	Practical	00	Internal	20	Credits	6

COURSE OBJECTIVES

1. To understand Computer, Software and Operating System
2. To learn about Multimedia and Hypermedia
3. To get the perspectives of Multimedia
4. To understand the various elements of multimedia
5. To understand the Multimedia on the web

COURSE OUTCOMES (CO)

1. Understanding of computer hardware and applications
2. Design multimedia applications
3. Basic understanding of multimedia elements
4. Apply audio and video in various applications
5. Apply various multimedia elements for web

UNIT-1	Basics of Computer	L	T	P
1.1	Computer System Concepts, Types Of Computers, Basic Components of a Computer System, Memory (Lecture, Discussion, Assignment)	3	1	-
1.2	Input Devices, Output Devices, Various Storage Devices (Lecture, Discussion, Participation)	3	1	-
1.3	Software Types, System software, Application software. System Software - Operating System, Utility Program, Assemblers, Compilers and Interpreter (Lecture, Discussion, Practice)	2	-	-
1.4	Application Software - Word processing, Spreadsheet, Presentation Graphics, Database Management System, Multimedia (Lecture, Discussion, Practice, Assignment)	3	1	-
1.5	Understand IT Communication (Lecture, Discussion, Quiz)	3	1	-

UNIT-2	Introduction to Multimedia	L	T	P
2.1	Multimedia - Introduction, applications, Components (Lecture, Discussion, Practice, Assignment)	3	1	-
2.2	Hardware and Software requirements, Characteristics of effective multimedia presentation (Lecture, Discussion, Practice, Assignment)	3	-	-
2.3	Overview of Multimedia Authoring Tools, Interactive media	3	-	-

	(Lecture, Discussion, Practice)			
2.4	Hypermedia, Distributed Multimedia Applications (Lecture, Discussion, Practice)	**3**	**1**	**-**
2.5	Multimedia Database Systems, Virtual Reality (Lecture, Discussion, Group activity)	**2**	**2**	**-**

UNIT-3	**Basics of Text and Graphics**	**L**	**T**	**P**
3.1	Text - Introduction, Standards - ASCII, Unicode. Fonts (Lecture, Discussion, Practice)	**3**	**1**	**-**
3.2	Graphics - Introduction, Types, Color and color models, digital images (Lecture, Discussion, Practice, Assignment)	**2**	**2**	**-**
3.3	Image processing, Graphic file formats (Lecture, Discussion, Practice, Quiz)	**1**	**2**	**-**
3.4	Graphics input and output devices (Lecture, Discussion, Assignment)	**2**	**2**	**-**
3.5	Graphics Software (Lecture, Discussion, Practice)	**1**	**2**	**-**

UNIT-4	**Introduction to Audio and Video**	**L**	**T**	**P**
4.1	Audio - Introduction, attributes, Mono V/s Stereo audio, audio channels (Lecture, Discussion)	**2**	**1**	**-**
4.2	Analog V/s Digital audio, Musical Instrument Digital Interface (MIDI), File formats (Lecture, Practice)	**1**	**2**	**-**
4.3	Audio recording and editing - hardware and software (Lecture, Practice)	**3**	**2**	**-**
4.4	Video - Introduction, Video frames and frame rate, video recording and editing - hardware and software, File formats (Lecture, Discussion, Practice)	**1**	**2**	**-**
4.5	Animation - Introduction, Principles, Types and Uses, Animation Software (Lecture, Discussion, Practice)	**3**	**1**	**-**

UNIT-5	**Multimedia on the Web**	**L**	**T**	**P**
5.1	Introduction of web site and web page, Bandwidth (Lecture, Discussion)	**1**	**2**	**-**
5.2	Text on the web - Dynamic and embedded font technology	**2**	**2**	**-**

	(Lecture, Discussion, Practice)				
5.3	Audio and video on the web, buffering and streaming (Lecture, Discussion, Practice)	2	2	-	
5.4	Hypermedia and Hyperlink (Lecture, Discussion)	1	2	-	
5.5	Webcasting, video conferencing (Lecture, Discussion)	2	2	-	

Practical / Projects/Assignments:
1. To prepare a multimedia element project.
2. To prepare a project of graphics file format.
3. To develop an Audio Storytelling project.
4. List with title and duration.
5. To prepare a list of web elements.

Suggested Readings:
1. An Introduction to Multimedia, John Villamil- Casanova, Louis Molina. ISBN 1575765578 / ISBN 9781575765570.
2. Designing Interactive Multimedia Systems, Mohammad Dastbaz. ISBN: 9780077098636
3. Multimedia Networking, Bohdan O. Szuprowicz. ISBN-978-0070631083
4. Multimedia on the Web, Stephen McGloughlin.
5. Adobe Photoshop CS6 Bible, Lisa DanaeDayley , Brad Dayley, Wiley publication. ISBN: 978-1-118- 12388-1
6. Photoshop CS6 in Simple Steps, Kogent Learning Solutions Inc. ISBN 9789350045879
7. Sound Forge 9.0 in Simple Steps, Kogent Solutions Inc., Dreamtech Press, ISBN-13: 978-8177228649
8. Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill, 2007
9. AnirbanMukhopadhyay and Arup Chattopadhyay, "Introduction to Computer Graphics and Multimedia", Second Edition, Vikas Publishing House.
10. Joey Lott and Robert Reinhardt. : Flash 8 Action Script Bible. Published by Wiley India (P) Ltd.2006
11. Kelly L. Murdock, 3ds max TM 4 Bible, John Wiley & Sons

E- Resources:
1. Li, Z., & Drew, S. (2004). Fundamentals of Multimedia [Ebook]. Pearson Education International.
2. Parekh, Ranjan. (2012). 2012: Principles of Multimedia (2/e).
3. https://www.strumentimusicali.net/manuali/SONY_SOUNDFORGEPRO10_ENG.pdf

1 B.Sc. (GA) 3
1CCC-3: Basics of Communication

Theory	80	Practical	00	Internal	20	Credits	6

COURSE OBJECTIVES

1. Introduce basic aspects of communication
2. To inculcate knowledge of human communication
3. To acquaint students with knowledge of the various types of communication
4. To orient students towards the barriers and modes of Communication
5. Correlate the theoretical aspects of communication

COURSE OUTCOMES (CO)

1. Develop an understanding of the nature of communication
2. Identify the concept of human communication
3. Apply various types and skills of communication
4. Compare the barriers of Communication.
5. Analysis about the theories & Models of Communication

UNIT-1	Communication Basics	L	T	P
1.1	Communication: Definitions, Meaning and Scope (Lecture, Discussion)	3	-	-
1.2	Communication: Elements, Processes and Functions (Lecture, Discussion and Participation)	3	1	-
1.3	Communication and Information, Communication and Languages Languages (Lecture and Participation)	3	1	-
1.4	Evolution of Social Groups and Organic Structure of Society (Lecture, Group activity)	3	-	-
1.5	Essentiality of Communication in Social Groups (Lecture, Participation, Quiz)	3	1	-

UNIT-2	Human Communication	L	T	P
2.1	Definition and Elements of Human Communication (Lecture and Assignment)	3	1	-
2.2	Socialization and Role of Communication in Socialization (Lecture, Discussion)	3	-	-
2.3	Essentials of Communication to Build the Society (Lecture and Group Activity)	3	1	-
2.4	Mutual Dependency of Language and Communication (Lecture, Practice, Assignment)	3	1	-
2.5	Culture and Communication	3	-	-

	(Lecture, Discussion)			

UNIT-3	Communication Types and Skills	L	T	P
3.1	Basic Classification: Intrapersonal Communication, Interpersonal Communication, Group Communication, Mass Communication (Lecture and Assignment)	3	1	-
3.2	Verbal Communication, Non verbal Communication, Importance of Body Language, Appropriate Body Postures (Lecture, Discussion)	2	1	-
3.3	Oral Communication, Written Communication, Visual Communication, Signs, Symbols and Code System (Lecture, Group Activity)	3	1	-
3.4	Communication Skills, Mannerism, Accent and Etiquettes (Lecture, Discussion)	3	1	-
3.5	Listening Skills —Important and Art of Developing Listening Habits (Lecture, Group activity)	2	1	-

UNIT-4	Communication Barriers & Modes	L	T	P
4.1	Different Barriers of Communication (Lecture, Discussion)	3	1	-
4.2	Removal of Barriers (Lecture, Group activity)	3	-	-
4.3	Traditional Modes of Communication (Lecture, Asassignment, In Class Exercise)	3	-	-
4.4	Telephone Communication, Mobile Communication, Video Conferencing and Television Communication (Lecture, Discussion)	3	1	-
4 .5	Satellite Communication, Internet, Multimedia Communication (Lecture, Discussion)	3	1	-

UNIT-5	Communication (Theories & Models)	L	T	P
5.1	Brief Introduction to Communication Theories & Models (Lecture, In Class Exercise)	3	1	-

5.2	Different Communication Theories: Multistep Theory, Selective Exposure, Selective Perception, Selective Retention, Play Theory (Lecture, Discussion)	3	1	-
5.3	Different Communication Theories: Uses & Gratification Theory, Cultivation Theory, Agenda Setting Theory (Lecture, Group Activity)	3	1	-
5.4	Different Communication Models: SMCR Model, Shannon & Weaver Model, Wilbur Schramm Model (Lecture, Quiz)	2	1	-
5.5	Different Communication Models: Lasswell Model, Gate Keeping Model, Sadharanikaran Model of Communication (Lecture, Assignment)	2	1	-

Practical/ Projects/ Assignment:
1. Discuss basic communication processes as well as self perception in communication
2. Write an essay/article on Communication and Society (500-800) words.
3. Assignment on audience understanding
4. Discuss effective communication in organization
5. Other assignment given by the concerned faculty

Suggested Readings:
1. McQuail Denis. Mass Communication Theory, 4th ed., Sage Publication Ltd., London, 2000
2. Rogers M. Everett. A History of Communication Study, New York, Free Press, 1997
3. Littlejohn, W. Stephen. Theories of Human Communication, 3rd ed., Belmont, California, 1989
4. Mass communication in India by Keval J. Kumar - A Jaico Book
5. Communication Mosaics: An introduction to the Field of Communication, 2001 By Wood, Julia T, Wadsworth
6. Communication by C.S. Raidu, Himalaya Publishing House
7. Barnlund, D. C. (2008). A transactional model of communication. In. C. D. Mortensen (Eds.), Communication theory (2nd ed., pp47-57). New Brunswick, New Jersey: Transaction
8. Adhikary, N. M. (2007d). Hindu awadha ranamagaira shabdik sanchar. In N. M. Adhikary, Sanchar shodhara media paryavekshan (pp. 139-180). Kathmandu: Prashanti Pustak Bhandar

E-Resources:
1. Communication Theory: http://communicationtheory.org
2. Mass Communication Theory: https://masscommtheory.com/
3. Human Communication: https://www.sciencedirect.com/topics/neuroscience/human-communication
4. Communication Theory: http://communicationtheory.org
5. Mass Communication Theory: https://masscommtheory.com/
6. Communication Types and Skills: https://www.youtube.com/watch?v=nvmZK_aBzGQ
7. Communication Barriers & Modes : http://www.jmpcollege.org/Adminpanel/AdminUpload/Studymaterial/BARRIERS%20TO%20COMMUNICATION-SEM%201.pdf

1 B.Sc. (GA) 4
1AECC-1: Communicative English

Theory	40	Practical	00	Internal	10	Credits	3

COURSE OBJECTIVE
1. To improve basic Grammar and essential of language skill
2. To train to identify the nuances of Phonetics, intonation and enhance pronunciation skills
3. To enable students to practice modern usage of English as it is spoken and written today with speech practice, reading passages and comprehension
4. To enhance with English vocabulary and Language Proficiency
5. To enable students to acquire a basic knowledge of phonetics required for effective communication

COURSE OUTCOMES (CO)
1. Use Grammatical English and essentials of language skills and identify the numbers of phonetics, intonation and flawless pronunciation
2. Implement English Vocabulary at command and Language Proficiency
3. Identify common error in Spoken and Written Communication
4. Understand and Improve the Non verbal Communication and Kinesics
5. Perform well in campus recruitment, engineering and all other general competitive examination

UNIT-1	Introduction to Sentence and Grammar	L	T	P
1.1	Sentences: Simple, Compound, Complex, Assertive, Interrogative, Imperative, Exclamatory (Lecture, Practice)	1	1	-
1.2	Clauses: Co-ordinate, Sub-ordinate, Relative, Adverb, Comparative (Adverb + Adjective) Articles: Usage of 'A', 'AN', 'THE' Preposition (Lecture, Practice)	1	1	-
1.3	Position of Prepositions, Place Relations Time Relations and other relations (Lecture, Practice)	1	1	-
1.4	Basic English Grammar and Part of Speech- Noun, Pronoun (Lecture, Practice)	1	1	-
1.5	Adjective, Verbs, Adverbs, Preposition, Articles, Conjunctions (Lecture, Practice)	1	-	-

UNIT-2	Tenses	L	T	P
2.1	The Sequence of Tenses, Tenses: Simple Present (Lecture, Practice)	1	1	-
2.2	Progressive Perfect (Lecture, Practice)	1	1	-

2.3	Present Perfect Progressive along-with Past Tense (Lecture, Practice)	1	1	-
2.4	Indications of futurity, Reported speech Modals (Will, Shall, Would and Other) (Lecture, Practice)	1	1	-
2.5	Voice: Active and Passive (Lecture, Practice)	1	-	-

UNIT-3	**Introduction to Listening Skills and Phonetics**	**L**	**T**	**P**
3.1	Introduction to Phonetics, Sound Mispronounced, Silent and non silent letter (Lecture, Practice)	1	1	-
3.2	Homonyms, Aspiration, Pronunciation of The, word ending age, some Plural forms (Lecture, Practice)	1	1	-
3.3	Articles: Use of articles-Indefinite an Definite Articles (Lecture, Practice)	1	1	-
3.4	Speech Sound: Vowels and Consonants: Exercises on it, Propositions Kind of Proposition and Prepositions often Confused (Lecture, Practice)	1	1	-
3.5	Word Accent - Rules for Word Accent, Stress Shift, Question Tags, Question Tags for Assertive Sentences, One word Substitutes and Exercises (Lecture, Practice)	1	-	-

UNIT-4	**Comprehension of Unseen Passage, Vocabulary and Speaking Skills**	**L**	**T**	**P**
4.1	Short answer type questions to test understanding of the passage (Lecture, Practice)	1	1	-
4.2	Usage of Dictionary and Thesaurus, Diction - Words meaning and Usage (Lecture, Practice)	1	1	-
4.3	Spelling rules, Verb patterns, Idioms and Phrases , Common error in Spellings and Sentences (Lecture, Practice)	1	1	-
4.4	Words formation, Strong and Weak forms of words, Extempore and Public Speaking (Lecture, Practice)	1	1	-
4.5	Information Transfer, Listening Comprehension, Common Errors in	1	-	-

	Pronunciation (Lecture, Practice)			

UNIT-5	**Paragraph Writing**	L	T	P
5.1	Paragraph writing based on expansion of given ideas Note taking /Note making (Lecture, Practice)	1	1	-
5.2	Introducing one self and others, Letter Formats & writing (Lecture, Practice)	1	1	-
5.3	Dialogue speaking and Writing in different situations (Lecture, Practice)	1	1	-
5.4	Developing ability of questioning and answering in a discourse (Lecture, Practice)	1	1	-
5.5	Practice of Introducing to an Interview board, Emergence of new English's (Lecture, Practice)	1	-	-

Practical / Projects/Assignments:

1. Paper reading before an audience (reading unseen passages)
2. Study of spelling Rules
3. Study of essentials of a good speech to respond and comprehend visual, oral themes, situations or stimulus and practice before select gathering
4. To depict the perceptions of assignment using Communication strategies.
5. Study of the Mechanics of writing.

Suggested Readings:

1. A Text Book of English Phonetics for Indian Students by T. Balasubramaniam. (Macmillan India Limited)
2. A Practical Course in English Pronunciation by J.Sethi, KamleshSadanand&D.V.Jindal (Prentice-Hall of India Private Limited)
3. English Grammar Practice – Raj N. Bakshi(Orient Longman)
4. Comfort, Jeremy, et al. Speaking Effectively: Developing Speaking Skills for Business English.
 Cambridge University Press, Cambridge: Reprint 2011
 Dutt P. Kiranmai and RajeevanGeeta. Basic Communication Skills, Foundation Books: 2013

E- Resources:

1. Basic English Grammar rules with example sentences accessed at https://basicenglishspeaking.com/basic-english-grammar-rules/
2. Basic English Grammar rules accessed at https://grammar.yourdictionary.com/grammar-rules-and-tips/basic-english-grammar-rules.html
3. English Grammar accessed at https://www.englishgrammar101.com/
4. Basics of English Grammar accessed at https://www.talkenglish.com/grammar/grammar.aspx

5. Complete Handbook of English Grammar accessed at
   https://www.learngrammar.net/english-grammar
6. Listening for Pronunciation Practice accessed at http://orelt.col.org/module/unit/1-listening-pronunciation-practice
7. Phonetics: The Sounds of Language
   https://scholar.harvard.edu/files/adam/files/phonetics.ppt.pdf

2 B.Sc. (GA) 1
2CCC-4: Digital Photography

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES
1. To acquaint students with knowledge of the digital camera
2. To teach various aspects of lighting and its impact on photography
3. Learn students about different camera lenses and other basic photographic equipment
4. Introduce various aspects of Photography
5. To develop the concept of color and composition in digital photography

COURSE OUTCOMES (CO)
1. Define the various theoretical and practical aspects digital photography
2. Identify the various aspects of digital camera
3. Apply the usage of light in taking pictures
4. Generate their technical skills for different types of photography
5. Identify the various aspects of different color tones and composition

UNIT-1	Basics of DSLR/SLR Camera	L	T	P
1.1	Evolution of Camera (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1
1.2	History of Photography (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	1	2	1
1.3	Photography Camera basics (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
1.4	Types of DSLR/SLR camera (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
1.5	Parts of DSLR /SLR camera: Lens, Aperture, Shutter, Camera Sensor, ISO Setting (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1

UNIT-2	Aesthetics of Photography	L	T	P
2.1	Impact of color in Photography Association of color moods hue, saturation (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1
2.2	Tone, shade, brightness, color contrast, Complimentary color (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	1	2	1
2.3	Rule of Third, Balancing Elements, Leading lines (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
2.4	Texture, Viewpoint, Depth of field, Patterns, Color	2	1	1

	(Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)			
2.5	Symmetry, Background, Compositional Rules (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1

UNIT-3	Lighting Technique in Photography	L	T	P
3.1	Color Temperature, White balance (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1
3.2	Basic lighting technique, Three point lighting and its effects (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	1	2	1
3.3	Lighting angles and directions (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
3.4	Lighting for set, Atmosphere (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
3.5	Types of Photography lights (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1

UNIT-4	Photography Lenses and Equipments	L	T	P
4.1	Controlling The Image (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1
4.2	Using different Focal Length Lenses, Filters and, its types (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	1	2	1
4.3	Close up equipments (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
4.4	Camera mounting device- Tripods, monopod (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
4.5	Storage media, Flash (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1

UNIT-5	Photoshop Software and Types of Photography	L	T	P
5.1	Sports & Action Photography, Portrait Photography, Candid Photography (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1
5.2	Product Photography, Wildlife & Nature Photography, Archaeological Photography, Architecture Photography, Aerial Photography	1	2	1

	(Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)			
5.3	Fundamental photo-editing techniques in Photoshop (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
5.4	Crop and straighten, Improve lighting and color, Remove unwanted content, Add creative effects, Sharpen and save (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	1	1
5.5	Non-Destructive Edits With Photoshop Layers, Edit Pictures Using Adjustment Layers, Select Areas with the Marquee and Lasso Tools, Using Masks (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1

Practical / Projects/Assignments:

1. Digital Portfolio With Print(Nature photography, Product Photography, Candid Photography, Architecture Photography)
2. Exercises demonstrating various types of Photography
3. Indoor photography techniques
4. Outdoor photography techniques
5. Lighting for product photography

Suggested Readings:

1. Handbook of Photography- Pradeep Tiwari- MCNUJC, Bhopal
2. Langford's Basic Photography: The Guide for Serious Photographers, Edition 0ISBN9781317964728.
3. The Digital Photography by Scott Kilby
4. Digital Photography Quicksteps-by Doug Sahlin
5. Langford's Basic Photography: The guide for serious photographers, Edition 8
6. Photoshop Elements 2020 For DummiesBarbara ObermeierTed PadovaOct 2019John Wiley & Sons
7. Photoshop: Your Ultimate Beginner Guide To Learning Adobe Photoshop BasicsRyan B. Morrissey 2018,Author's Republic

E- Resources:

1. http://edit.educ.ttu.edu/site/jcheon/manual/Digital_Photography.pdf
2. http://vision.cse.psu.edu/courses/CompPhoto/PhotoIntro.pdf
3. https://www.biofos.com/esystem/olydigfaq.pdf
4. http://myy.haaga-helia.fi/~woljo/photoshop/an-introduction-to-adobe-photoshop.pdf

2 B.Sc. (GA) 2
2CCC-5: Basic Mathematics

| Theory | 80 | Practical | 00 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES
1. To introduce the students about Numbers and basic Algebra
2. To practice the students about Geometry
3. To introduce the students about Trigonometry and Cartesian Coordinates
4. To practice the students about Vectors
5. To introduce the students about Matrices and Interpolation

COURSE OUTCOMES (CO)
1. Evaluate the roots of a Quadratic equation and also recognize the number
2. Evaluate the area of regular and irregular shapes
3. Calculate the values of Trigonometric function and also compute Pythagoras theorem in 2D and 3D objects
4. Compute operations on vectors as well as scalar
5. Evaluate the Matrix Operations (Matrix Addition, Matrix Subtraction, Matrix Multiplication,) and also calculate Linear, Non-linear interpolation

UNIT-1	Numbers and Basic Algebra	L	T	P
1.1	Numbers: Natural Numbers, Prime Numbers, Integers, Rational Numbers, Irrational Numbers (Lecture, Discussion)	3	1	-
1.2	Real Numbers, The Number Line, Complex Numbers (Lecture, Discussion)	2	1	-
1.3	Algebra: Notation, Algebraic Laws: Associative Law, Commutative Law, Distributive Law (Lecture, Discussion, Assignment)	3	1	-
1.4	Solving the Roots of a Quadratic Equation, Indices: Laws of Indices (Lecture, Discussion, Assignment)	2	1	-
1.5	Logarithms, Further Notation ($<$ less than, $>$ greater than, $\leq$ less than or equal to, $\geq$ greater than or equal to $\sim=$ approximately equal to, $\equiv$ equivalent to, $=$ not equal to) (Lecture, Discussion, Assignment)	3	1	-

UNIT-2	Geometry	L	T	P
2.1	Points, Lines, Planes and Angles (Lecture, Discussion)	2	1	-
2.2	Parallel Lines & Transversals (Lecture, Discussion)	2	1	-

2.3	Polygons, Angles in a Polygon, Triangles, Quadrilaterals (Lecture, Discussion, Assignment)	2	2	-
2.4	Circles, Congruent Figures, Perimeter & Circumference (Lecture, Discussion)	2	2	-
2.5	Area (Polygon, Triangle, Circle, Square), Area of Irregular Shapes (Lecture, Discussion, Assignment)	2	2	-

UNIT-3	Trigonometry and Cartesian Coordinates	L	T	P
3.1	Trigonometry: The Trigonometric Ratios, Inverse Trigonometric Ratios (Lecture, Discussion, Assignment)	2	1	-
3.2	Trigonometric Relationships, The Sine Rule, The Cosine Rule (Lecture, Discussion, Assignment)	2	1	-
3.3	Compound Angles, Perimeter Relationships (Lecture, Discussion)	2	1	-
3.4	Cartesian Coordinates: The Cartesian xy-plane (Function Graphs, Geometric Shapes, Polygonal Shapes, Areas of Shapes, Theorem of Pythagoras in 2D) (Lecture, Discussion)	3	2	-
3.5	3D Coordinates: Theorem of Pythagoras in 3D, 3D Polygons (Lecture, Discussion)	3	1	-

UNIT-4	Vectors	L	T	P
4.1	Vector Notation, Graphical Representation of Vectors, Magnitude of a Vector (Lecture, Discussion)	3	1	-
4.2	Vector Manipulation , Multiplying a Vector by a Scalar (Lecture, Discussion, Assignment)	3	1	-
4.3	Vector Addition and Subtraction (Lecture, Discussion, Assignment)	2	1	-
4.4	Position Vectors, Unit Vectors, Cartesian Vectors (Lecture, Discussion)	2	1	-
4.5	Vector Multiplication, Scalar Product (Lecture, Discussion, Assignment)	3	1	-

UNIT-5	Matrices and Interpolation	L	T	P

5.1	Matrices: Systems of Notation, The Determinant of a Matrix (Lecture, Discussion, Assignment)	3	1	-
5.2	Operations on Matrices (Lecture, Discussion, Assignment)	2	1	-
5.3	Interpolation: Linear Interplant (Lecture, Discussion)	2	1	-
5.4	Non-Linear Interpolation: Trigonometric Interpolation, Cubic Interpolation (Lecture, Discussion, Assignment)	3	1	-
5.5	Interpolating Vectors, Interpolating Quaternion's (Lecture, Discussion)	3	1	-

Practical / Projects/Assignments:

1. Assignments are given by subject teacher.
2. Study of application of geometry in practice.
3. Study of application of trigonometry in practice.
4. Study of application of Matrices in practice.
5. Study of application of Interpolation in practice.
6. Study of application of 3D shapes in practice.

Suggested Readings:

1. John Vince, "Mathematics for Computer Graphics", Springer
2. Prof. M L Khanna, "Coordinate Geometry", Jai Prakash Nath& Co
3. B. S. Grewal, "Engineering Mathematics", Khanna Publication
4. R.D. Sharma, "Mathematics for Class 12 by R D Sharma", DhanpatRai Publications
5. R.D. Sharma, "Mathematics for Class 11 by R D Sharma", DhanpatRai Publications
6. R.D. Sharma, "Mathematics for Class 10 by R D Sharma", DhanpatRai Publications
7. R.D. Sharma, "Mathematics for Class 9 by R D Sharma", DhanpatRai Publications
8. R.D. Sharma, "Mathematics for Class 8 by R D Sharma", DhanpatRai Publications

E-Resources:

1. Mathematics for Computer Graphics accessed at http://pdf.nsc.ac.id/1-buku%20komputer%20grafis-20170515052347.pdf
2. Basic Algebra accessed at https://www.intmath.com/basic-algebra/basic-algebra-intro.php
3. Basics of Geometry accessed at https://www.toppr.com/guides/maths/lines-and-angles/basics-of-geometry/

2 B.Sc. (GA) 3
2CCC-6: Layout Design

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES
1. Create layouts based on the Principles of Design and Page Layout Concepts
2. Develop projects through the design process and methods
3. Evaluate layouts using design vocabulary
4. Understand the tools in Adobe InDesign
5. Identify and apply appropriate tools in Adobe InDesign for producing e publications

COURSE OUTCOMES (CO)
1. Understanding the core principles of design
2. Identify effective and aesthetically pleasing Layout and the relevant design elements associated with it
3. Demonstrate typographic, page layout and document-construction skills
4. Develop Skill to produce print publications like brochures, magazines
5. Develop Skill to produce digital publications like an interactive Adobe PDF with form fields

UNIT-1	Introduction	L	T	P
1.1	Principles of Design, Golden Rules of Design, Design Elements (Lecture)	2	-	-
1.2	Design Vocabulary, Design Process and Methods (Lecture, Practice)	2	-	1
1.3	Page Layout concepts, Layout and Page Design Fundamentals (Lecture, Practice)	2	-	2
1.4	Layout Process Golden Section and harmonious page formats (Lecture, Practice)	3	-	3
1.5	Design Grid, Types of Page Layout (Lecture)	3	-	-

UNIT-2	Page Layout in Cross Media World	L	T	P
2.1	Interactive e books (Lecture, Practice)	2	-	1
2.2	Scrolling Web pages (Lecture, Practice)	1	-	2
2.3	Interactivity, Sound, Animation (Lecture, Practice)	2	-	1
2.4	Movies, Slideshows (Lecture, Practice)	3	-	3

2.5	Colour Theory (Lecture, Practice)	2	-	1

UNIT-3	Adobe InDesign - 1	L	T	P
3.1	Introducing the Workspace (Lecture, Practice)	2	-	2
3.2	Getting to Know InDesign (Lecture, Practice)	1	-	1
33	Setting Up a Document and Working with Pages (Lecture, Practice)	2	-	2
3.4	Working with Objects (Lecture, Practice)	2	-	2
3.5	Flowing Text (Lecture, Practice)	2	-	2

UNIT-4	Adobe InDesign -2	L	T	P
4.1	Editing Text (Lecture, Practice)	1	-	2
4.2	Working with Typography (Lecture, Practice)	2	-	2
4.3	Working with Colour (Lecture, Practice)	2	-	2
4.4	Working with Styles (Lecture, Practice)	1	-	2
4.5	Importing and Modifying Graphics (Lecture, Practice)	2	-	2

UNIT-5	Adobe InDesign -3	L	T	P
5.1	Creating Tables (Lecture, Practice)	1	-	2
5.2	Working with Transparency (Lecture, Practice)	2	-	2
5.3	Printing and Exporting (Lecture, Practice)	2	-	2
5.4	Creating Adobe PDF Files with Form Fields (Lecture, Practice)	1	-	2

5.5	Creating a fixed-Layout epub (Lecture, Practice)	**2**	**-**	**2**

Practical/Projects/Assignments:
1. Preparation of Corporate Profiles (Ex. Logo, Letter Head, Visiting Card, Envelope, Brochure) using Adobe InDesign
2. Preparation of public interest posters (Ex. World Peace Day/Child Labour Day/Anti-Ragging or Drug Addiction or Smoking.
3. Preparation of Press Ad of given product digitally.
4. Preparation of media layout (Ex. Banner) and selection of art materials related with Multimedia.
5. Preparation of visual design on particular advertising media, publicity using digital platform.
6. Preparation of interactive application design: digital publications like an interactive Adobe PDF with form fields

Suggested Readings:
1. Art and Print Production N.N.Sarkar, Oxford University Press; 2 edition (13 May 2013), ISBN-10:
   0198085567, ISBN-13: 978-0198085560
2. Adobe InDesign CC Classroom in a Book, Kelly Kordes Anton & Tina DeJarld, Pearson Education; First edition (15 June 2018) ISBN-10: 935286901X, ISBN-13: 978-9352869015
3. Universal Principles of Design; by William Lidwell , Kritina Holden, Jill Butler, Publish by : Rockport , 2010, January 1, 2010; ISBN 978-1631590405
4. Deconstructing Product Design: by William Lidwell , Gerry Manacsa; Publish by : Rockport November 1, 2009; ISBN: 161673602X, 9781616736026

E- Resources:
1. The Basic Elements of Design accessed at https://design.tutsplus.com/articles/the-basic-elements-of-design--cms-33922
2. Basic Elements and Principles of Graphic Design accessed at https://1stwebdesigner.com/graphic-design-basics-elements/
3. Website layout in 27 steps accessed at https://www.creativebloq.com/web-design/steps-perfect-website-layout-812625
4. How to create balanced page layouts accessed at https://www.creativebloq.com/netmag/create-balanced-page-layouts-7-pro-tips-121310009
5. Design and layout, graphic design, web design accessed at http://websitetips.com/layout/
6. Adobe InDesign CC Tutorial accessed at https://www.tutorialspoint.com/adobe_indesign_cc/index.html
7. InDesign tutorials accessed at https://helpx.adobe.com/in/indesign/tutorials.html
8. InDesign Tutorials and Essential Tips accessed at https://redokun.com/blog/indesign-tutorial
9. Adobe InDesign Tutorial accessed at https://www.javatpoint.com/adobe-indesign

2 B.Sc. (GA) 4
2AECC-2: Environmental Studies

| Theory | 40 | Practical | 00 | Internal | 10 | Credits | 3 |

COURSE OBJECTIVE

1. To demonstrate a congenial learning of Environment Factors to students
2. To generate in students the awareness about Environmental Problems
3. To define the types of Environmental Ecosystems & its formation to students
4. To associate the knowledge of various Environmental Ethics to students
5. To illustrate to the students problems relating to Human Population on Environment

COURSE OUTCOMES (CO)

1. Recognize various environmental factors
2. Analyze environmental problems
3. Characterize ethical issue for environmental related issue
4. Identity methods to protect environmental
5. Recognize effect to population on environmental

UNIT-1	The Multidisciplinary Nature of Environmental Studies and Natural Resources	L	T	P
1.1	Definition; Scope and importance, Need for public awareness. Natural resources and associated problems. Forest resources: Use and Over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people (Class room lectures)	1	1	-
1.2	Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems (PPTs)	1	1	-
1.3	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies (PPTs & Class room lectures)	1	1	-
1.4	Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies (PPTs & case study of Microsoft)	1	1	-

1.5	Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles (Class room lectures)	1	-	-

UNIT-2	Ecosystems, Biodiversity and its Conservation	L	T	P
2.1	Concept, structure and function of an ecosystem, producers, consumers and decomposers, energy flow in the ecosystem, ecological succession, food chains, food webs and ecological pyramids (Class room lectures & PPTs)	1	1	-
2.2	Introduction, types, characteristic features, structure and function of the following ecosystem: - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (PPTs)	1	1	-
2.3	Biodiversity introduction-Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, biodiversity at global, national and local levels, India as a mega-diversity nation, Hot-spots of biodiversity (PPTs & Class room lectures)	1	1	-
2.4	Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, endangered and endemic species of India (PPTs & Case study related to Kanha Wild life reserve)	1	1	-
2.5	Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity (PPTs & Class room lectures)	1	-	-

UNIT-3	Environmental Pollution	L	T	P
3.1	Definitions. Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards (PPTs)	1	1	-
3.2	Solid waste Management: Causes, effects and control measures of urban and industrial wastes (PPTs & Class room Lectures)	1	1	-
3.3	Role of an individual in prevention of pollution (PPTs & Class room lectures,)	1	1	-
3.4	Pollution case studies (Case Study)	1	1	-

3.5	Disaster management: floods, earthquake, cyclone and landslides (PPTs & Class room lectures)	1	-	-

UNIT-4	Social Issues and the Environment	L	T	P
4.1	From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people; its problems and concerns. Case studies (PPTs &Case Studies related to watershed management)	1	1	-
4.2	Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies (PPT)	1	1	-
4.3	Wasteland reclamation, Consumerism and waste products (PPT & class room lectures)	1	1	-
4.4	Environment Protection Act- Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act (PPT & class room lectures)	1	1	-
4.5	Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness (PPT)	1	-	-

UNIT-5	Human Population and the Environment	L	T	P
5.1	Population growth, variation among nations (PPT & class room lectures)	1	1	-
5.2	Population explosion-Family welfare Program (PPTs)	1	1	-
5.3	Environment and human health (PPTs , class room lectures& GDs)	1	1	-
5.4	Human Rights, Value Education, HIV/AIDS, Women and Child Welfare (PPTs & Class room lectures)	1	1	-
5.5	Role of information Technology in Environment and human health, Case Studies (Class room lectures)	1	-	-

Practical / Projects / Assignments:
1. Project report on ill effects of environmental pollution.
2. Group Study on biotic & a biotic components of environment.

3. Perform a case study on 10 households in your vicinity and mention the type of natural and renewable resources they use or consume on a day-to-day basis.
4. Mention along with photographs and small description of major types of biotic (fauna and Flora (5 each) and a biotic components (minimum 5) that are present in your surrounding areas.
5. Prepare a short story with picture illustrations of the ill effect of environmental pollution in your surrounding areas.
6. Mention the legal Acts to Prevent and Control Pollution.
7. Mention the role of media towards prevention, control and awareness towards future environmental pollution impacts and consequences.

Suggested Readings:
1. Srivastava, Smriti.(2009). Environmental Studies.NewDelhi:S.K. Kataria& Sons
2. Dhankar, Rajesh.(2006).Environmental Studies.New Delhi: Daya Books Pvt. Ltd.
3. Kanagasabai, S.(2010). Environmental Studies.NewDelhi:PHI Learning Pvt. Ltd
4. Bagad,Anjali.(2009). Environmental Studies. New Delhi: Technical Publications.

E- Resources:
1. https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf
2. https://www.kopykitab.com/Environmental-Studies-by-J-P-Sharma
3. https://www.tutorialspoint.com/environmental_studies/environmental_studies_tutorial.pdf
4. https://www.ametuniv.ac.in/exam_attachment/Question%20Bank/UG/Marine-Bio-Technology/EVS.pdf

3 B.Sc. (GA) 1
3CCC-7: Audio Editing

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES
1. Introduce basic audio terminology and concepts
2. To understand the basic working of audio production equipment
3. To understand the Software for digital audio recording and editing
4. Learn students about significance of effective audio productions
5. To develop students about significance technical skills for audio production

COURSE OUTCOMES (CO)
1. Know the various theoretical and practical aspects of audio
2. Describe the audio production equipment and Its Practice
3. Implement the Uses and Strategies for digital audio recording and editing
4. Assess their Skills for audio productions
5. Generate their technical skills for editing tools and techniques of audio

UNIT-1	Introduction of Digital Audio	L	T	P
1.1	Introduction to Audio components, Sound and its Attributes, Effect and use of in multimedia products (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	2	-	1
1.2	Analog V/s Digital sound (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation)	1	2	1
1.3	Basics of digital Sounds - Sampling, Frequency, Sound Depth, Channels (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
1.4	Advantages of Digital Audio (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
1.5	Audio Input/output devices (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1

UNIT-2	Introduction of Microphones & Audio Cable & Connectors	L	T	P
2.1	Types of microphone (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1
2.2	Types of microphone construction & pickup pattern (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	1	2	1
2.3	Audio cable, different types of audio connectors (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
2.4	Portable audio Mixer for outdoor shoot (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1

2.5	Audio console for multi camera production (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1

UNIT -3	Audio Production	L	T	P
3.1	Selection and use of different microphones and other in-camera recording modes (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1
3.2	Indoor audio production, outdoor/ field audio production (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	1	2	1
3.3	Portable audio mixer, audio console (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
3.4	Field recording, sound recorders, audio mixer (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
3.5	Single camera production sound recording and multi camera production sound recording (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1

UNIT-4	Audio File Formats and Editing	L	T	P
4.1	Types of Audio file formats, Conversion of audio files, Audio File Compression - Compressed file formats (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1
4.2	Advantages & Disadvantages of compressed files, Audio file formats: Track, WAV, MP3 etc. MIDI files (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	1	2	1
4.3	Basic Editing in Adobe Audition editing software: Overview of Editing Tools - Selection, Cutting and Copying of Data, Pasting of Data, Paste Special, Multiple Paste, Deleing etc. Editing the Cut lists (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
4.4	Audio Effects in Sound Forge- Echo Effects, Pitch Effects, Volume Effects, Reverberation Effects, Wave Hammer Effect (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
4.5	Synthesis, Synthesizing Audio, Sampling, Batch Processing (Lecture, Discussion, Practice, Demonstration, Assignment, Presention, Practical)	2	-	1

UNIT-5	Audio Post Production	L	T	P
5.1	Foley artist (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1
5.2	create background sound (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	1	2	1
5.3	Dialog (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
5.4	Voice over (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	1	1
5.5	Audio effect (Lecture, Discussion, Practice, Demonstration, Assignment, Presentation, Practical)	2	-	1

Practical/Projects/Assignments:
1. To create Audio recording for different types of microphone use.
2. To create Outdoor audio recording.
3. To create Indoor audio recording
4. To create Audio Advertisements
5. To create Audio Jingles
6. To create Audio PSA(Public Service Announcements)

Suggested Readings:
1. Designing Sound; Andy Farnell; MIT Press, ISBN :20100262014416, 9780262014410
2. Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema; by David Sonnenschein ; ISBN:0941188264 (ISBN13: 9780941188265) ; 2001 by Michael Wiese Productions
3. Digital Audio Editing: Correcting and Enhancing Audio in Pro Tools, Logic Pro, Cubase, and Studio One, Simon LangfordOct 2013, CRC Press
4. Adobe Audition CC Classroom in a Book Paperback – Import, 24 December 2018 by Adobe Creative Team (Author), Maxim Jago (Author)

E-Resources:
1. https://www.bhphotovideo.com/explora/pro-audio/buying-guide/a-guide-to-voice-over-equipment
2. https://training.npr.org/2018/10/31/mixing/
3. https://training.npr.org/2017/01/31/the-ear-training-guide-for-audio-producers/
4. https://helpx.adobe.com/pdf/audition_reference.pdf

3 B.Sc. (GA) 2
3CCC-8: -Script Writing and Storyboarding

| Theory | 80 | Practical | 00 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES

1. Introducing writing, its purpose and different types
2. Identifying basics forms of writing for various media
3. Perceive the contribution of screenplay in script writing
4. Understanding screenplay, plot & style in script writing
5. Introduce storyboard and its effectiveness

COURSE OUTCOMES (CO)

1. Generate scripts in different formats
2. Categorized different forms of writing for various mediums
3. Construct and design screenplay for a short film
4. Construct and design screenplay for animation or film genre
5. Author storyboard and visualize for a short story

UNIT-1	Introduction to Writing	L	T	P
1.1	Purpose and types of writing (Lecture, Discussion)	2	2	-
1.2	Forms of writing: Prose, Poetry, Letters, Essay (Lecture, Discussion, Practice)	2	2	-
1.3	News, Article, Feature Review, Film Review (Lecture, Discussion)	2	1	-
1.4	Memoir, Travelogue (Lecture)	2	1	-
1.5	Writing a Play, Story and Novel (Lecture, Assignment)	2	2	-

UNIT-2	Introduction to Writing for Different Media	L	T	P
2.1	Basic principles of writing for Film and Television (Lecture, Discussion)	2	2	-
2.2	Basic principles of writing for animated movies (Lecture, Discussion, Practice)	2	2	-
2.3	Concepts of writing for Multimedia and Animation Movies (Lecture, Discussion, Practice, Assignment)	2	1	-
2.4	Basics of writing for Animation (Lecture, Discussion, Practice)	2	1	-
2.5	Basics of writing for Game Design (Lecture, Practice)	2	2	-

UNIT-3	Screenplay Basics – Theme And Plot	L	T	P
3.1	Film Genres: Drama, Melodrama (Lecture, Discussion)	2	2	-
3.2	Comedy, Action, Tragedy, Fantasy etc (Lecture, Discussion, Practice)	2	2	-
3.3	Theme and Plot (Lecture, Practice)	2	1	-
3.4	Beginning, middle and end, Location (Lecture, Discussion, Practice)	2	1	-
3.5	Music, From Scenes to Sequences (Lecture, Discussion, Practice)	2	2	-

UNIT-4	Screenplay Basics – Types & Structure	L	T	P
4.1	Screenplay, Shooting Script, AV Script (Lecture, Discussion)	2	2	-
4.2	Concept- Goals and Objectives (Lecture, Discussion, Practice)	2	2	-
4.3	Structure- Flashback, Conflict, Climax (Lecture, Discussion, Practice)	2	1	-
4.4	Style- Fade in, Scene Heading, Character (Lecture, Practice, Assignment)	2	1	-
4.5	Action, Dialogue, Transition (Lecture, Assignment)	2	2	-

UNIT-5	Introduction to Storyboard	L	T	P
5.1	Need and Importance of Storyboard (Lecture, Practice, Assignment)	2	2	-
5.2	Formats of Storyboard, Planning of visual storytelling (Lecture, Practice, Assignment)	2	2	-
5.3	Shot Types, Continuity, Transitions and sequencing (Lecture, Discussion, Practice)	2	1	-
5.4	Introduction to Popular Storyboard software (Lecture, Discussion, Practice)	2	1	-
5.5	Storyboard Techniques: Short Film and Animation (Lecture, Discussion, Practice)	2	2	-

Practical / Projects/Assignments:
1. Exercises of scripting on different format
2. Write a script for Television
3. Write a five minutes story on any current issue.
4. Prepare a storyboard for a 2 min story with 10 to shots
5. Write a Film Review on any one film
6. Write a script for a travelogue

Suggested Readings:
1. Screenplay: The Foundations of Screenwriting: Syd Field
2. Making a Good Script Great: A Guide for Writing & Rewriting: Linda Seger
3. Script Writing: How to Write a Screenplay: Aishley Foley
4. From Word to Image: Storyboarding and the Filmmaking Process: Marcie Begleiter
5. Animation - The Art of Layout and Storyboarding: Mark Byrne
6. Storyboarding: Turning Script to Motion: Stephanie Torta and Vladimir Minuty
7. पटकथा लेखन: एक परिचय मनोहर श्याम जोशी

E-Resources:
1. Namita Kabilas, The Nine Key Secrets of Writing a Good Screenplay (E-Book): 2018
2. Jurgen Wolff &Kerry Cox Successful Scriptwriting: How to write and pitch winning scripts for movies, sitcoms, soaps, serials and variety shows; https://www.kobo.com/us/en/ebook/successful-scriptwriting-2
3. https://www.studiobinder.com/blog/how-to-write-a-screenplay/
4. https://industrialscripts.com/scriptwriting-guide/
5. https://youtu.be/RQsvhq28sOI
6. https://www.vyond.com/resources/what-is-a-storyboard-and-why-do-you-need-one/

3 B.Sc. (GA) 3
3CCE-1: Website Design

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES
1. To introduce about web design and the Internet
2. To practice the basic tags of HTML
3. To apply various multimedia elements in HTML pages
4. To practice creating webpage using CS
5. To implement JavaScript in HTML

COURSE OUTCOMES (CO)
1. Student would have knowledge about Web design process and Internet
2. Student can create HTML pages using basic tags
3. Student can design HTML pages using various multimedia elements
4. Student can create stylish HTML pages using CSS
5. Student can design dynamic HTML pages using JavaScript

UNIT-1	Web Design and Internet	L	T	P
1.1	Web Design Principles, Basic principles involved in developing a web site (Lecture, Discussion, Demonstration)	2	-	1
1.2	Planning process, Rules of web designing, Designing navigation bar (Lecture, Discussion, Demonstration,)	1	2	1
1.3	Page design, Home Page Layout, Design Concept (Lecture, Discussion, Assignment)	2	1	1
1.4	Basics in Web Design, Characteristics of website, Web Standards, Audience requirement (Lecture, Discussion, Demonstration, Assignment)	2	1	1
1.5	A Brief History of the Internet, World Wide Web (Lecture, Discussion, Demonstration, Assignment)	2	-	1

UNIT-2	HTML-I	L	T	P
2.1	Introduction to HTML (Lecture, Discussion, Demonstration)	2	-	1
2.2	HTML Documents, Basic structure of an HTML document (Lecture, Discussion, Practice)	1	2	1

2.3	Creating an HTML document, Mark-up Tags (Lecture, Discussion, Practice, Assignment)	2	1	1
2.4	Heading-Paragraphs, Line Breaks (Lecture, Discussion, Practice)	2	1	1
2.5	HTML Tags (Lecture, Discussion, Practice, Assignment)	2	-	1

UNIT-3	HTML-II	L	T	P
3.1	Elements of HTML (Lecture, Discussion)	2	-	1
3.2	Working with Text (Lecture, Discussion, Practice)	1	2	1
3.3	Working with Lists, Tables and Frames (Lecture, Discussion, Practice, Assignment)	2	1	1
3.4	Working with Hyperlinks, Images and Multimedia (Lecture, Discussion, Practice, Demonstration)	2	1	1
3.5	Working with Forms and Controls (Lecture, Discussion, Practice)	2	-	1

UNIT-4	Cascading Style Sheets (CSS)	L	T	P
4.1	Introduction to Cascading Style Sheets, Concept of CSS, Types of CSS, Creating Style Sheet, CSS Properties (Lecture, Discussion, Practice, Assignment)	2	-	1
4.2	CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects (Lecture, Discussion, Practice)	1	2	1
4.3	Working with Lists and Tables, CSS Id and Class, Box Model (Introduction, Border properties, Padding Properties, Margin properties) (Lecture, Discussion, Practice, Assignment)	2	1	1
4.4	CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector) (Lecture, Discussion, Practice, Demonstration)	2	1	1
4.5	CSS Color, Creating page Layout and Site Designs (Lecture, Discussion, Practice)	2	-	1

UNIT-5	JavaScript	L	T	P

5.1	JavaScript Introduction, Variable declaration, Operators (Lecture, Discussion, Demonstration)	2	-	1
5.2	Control Statements, Error Handling, Understanding arrays (Lecture, Discussion, Practice, Demonstration)	1	2	1
5.3	Function Declaration, Built In Functions (Lecture, Discussion, Practice)	2	1	1
5.4	Standard Date and Time Functions, HTML Document object Model (Lecture, Discussion, Practice, Assignment)	2	1	1
5.5	Working with HTML form and its elements (Lecture, Discussion, Assignment, Practice)	2	-	1

Practical/Projects/Assignments:
1. To create a simple html file to demonstrate the use of different tags.
2. To create an html file to link to different html pages which contains images, tables, and also link within a page.
3. To create an html page with different types of frames such as floating frame, navigation frame & mixed frame.
4. To create a registration form as mentioned below.
   Procedure: Create an html page named as "registration.html"
   - set background colors
   - use table for alignment
   - provide font colors & size
5. To create an html file by applying the different styles using inline, external & internal style sheets.
6. To write a JavaScript program to define a user defined function for sorting the values in an array.
7. To create an html page to explain the use of various predefined functions in a string and math object in JavaScript.
8. To create an html page to explain the use of various predefined functions in an array & Date object in JavaScript.
9. To create an html page to demonstrate exception handling in JavaScript.
10. To display the calendar using JavaScript code by getting the year from the user.
11. To create an html registration form and to validate the form using JavaScript code.
12. To create an html file to open a new window from the current window using JavaScript.
13. To create an html page to change the background color for every click of a button using JavaScript.
14. To create an html page with 2 combo box populated with month & year, to display the calendar for the selected month & year from combo box using JavaScript.
15. To create an html page to display a new image & text when the mouse comes over the existing content in the page.

Suggested Readings:
1. Steven M. Schafer, "HTML, XHTML, and CSS Bible, 5ed", Wiley India
2. John Duckett, "Beginning HTML, XHTML, CSS, and JavaScript", Wiley India
3. Ian Pouncey, Richard York, "Beginning CSS: Cascading Style Sheets for Web Design", Wiley India
4. Kogent Learning, "Web Technologies: HTML, Javascript", Wiley India
5. Web Technologies, Black Book, Dreamtech Press
6. HTML 5, Black Book, Dreamtech Press

E- Resources:

1. HTML Tutorial accessed at https://www.w3schools.com/html
2. CSS Tutorial accessed at https://www.w3schools.com/css
3. JavaScript Tutorial accessed at https://www.w3schools.com/js

3 B.Sc. (GA) 3
3CCE-2: Design Concept and Technology

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES:

1. To know the student design disciplines, Management and Aesthetics
2. Knowledge of Design Focuses on Understanding the Way Informed, Creative and Critical Development of New Ideas is achieved and how these are realised
3. Initially students learn basic concepts relating to 'What is design?' and how or why something may be described as a 'good' or 'bad' design
4. Students progress to advanced concepts relating to sustainable design and innovation as currently understood, and to complex concepts relating to future focused themes
5. Principles of good design, and making judgements of a design's quality in the context of its use

COURSE OUTCOMES (CO)

1. Understand the elements that underpin design within a specified context
2. Describe considerations used to determine the quality of a design within a specified context
3. Discuss the quality of a design in relation to design elements and considerations of the specific context in which the design is situated
4. Explain the relationship between lifecycle design, innovation and sustainability
5. Discuss the impact of contemporary judgment criteria on design decision making

UNIT-1	**Introduction to Design**	L	T	P
1.1	Definition of Design, Brief history of developments in Design and Technology, Aesthetics sense. Design and Society (Lecture)	2	-	1
1.2	Principles of Design- Balance, Contrast, Direction, Economy, Emphasis, Proportion, Rhythm, Unity (Lecture, Discussion, Practice)	1	2	1
1.3	Elements of design- An introduction to basic elements: Line, texture, colour, form, symmetry, balance, scale, mass, movement (Lecture, Discussion, Practice)	2	1	1
1.4	Stages of design processes, User centered considerations in Design (Lecture, Discussion, Practice)	2	1	1
1.5	Design fundamentals- Scenario building; Personas, Brain Storming, , Wire framing, prototyping and documentation, story boarding, Site map (Lecture, Discussion, Practice)	2	-	1

UNIT- 2	**Information Design**	L	T	P

2.1	Introduction to information design and information visualizations (Lecture, Discussion, Practice)	2	-	1
2.2	The Design of Info graphics& Data Visualizations, Interactive data visualization (Lecture, Discussion, Practice)	1	2	1
2.3	Visual presentation of information-Text and Documents, Hypertext , Multimedia, Graphs and Networks, augmented VR, Hierarchies and Trees (Lecture, Discussion, Practice)	2	1	1
2.4	Multivariate Visual Representations (Lecture, Discussion, Practice)	2	1	1
2.5	Over view -Process of data gathering for information visualizations (Lecture, Discussion, Practice)	2	-	1

UNIT- 3	Interaction Design	L	T	P
3.1	Basic concepts in Interaction Design, Interaction Model -(HCI) Human computer interaction (Lecture, Discussion, Practice)	2	-	1
3.2	Different types of interface, making the different tangible and intangible interfaces user friendly designing for different screens (web, TVs and mobile devices) (Lecture, Discussion, Practice)	1	2	1
3.3	Interactive design for game (Lecture, Discussion, Practice)	2	1	1
3.4	Sensor based context aware interaction, Multi-modal displays (Lecture, Discussion, Practice)	2	1	1
3.5	New trends in interaction design (Lecture, Discussion, Practice)	2	-	1

UNIT- 4	Communication Design	L	T	P
4.1	Introduction to communication. Its importance in society. Verbal and non-verbal communication, audio and visual communication (Lecture, Discussion, Practice)	2	-	1
4.2	Introduction to Publication Design Press Layout Designing, Context based Press layouts (Lecture, Discussion, Practice)	1	2	1

4.3	Illustration based- iconography, symbolism & analogy, introduction to semiotics and the study of signs semiotics in film & advertising (Lecture, Discussion, Practice)	2	1	1
4.4	Design fundamentals related to -Posters, banners, flyers, cover page, Typography (Lecture, Discussion, Practice)	2	1	1
4.5	Design for Social media-social media post, web banners (Lecture, Discussion, Practice)	2	-	1

UNIT- 5	Creativity, Innovation and Design Management	L	T	P
5.1	Creative thinking phenomena, Creativity techniques and tools; Brain storming, , Imagery visualization, Theory of Inventive Problem Solving(TRIZ) (Lecture, Discussion, Practice)	2	-	1
5.2	Innovation and its management Examine the roles of design and innovation in achieving organizational objective (Lecture, Discussion, Practice)	1	2	1
5.3	Team building, interpersonal relationship and conflict resolution (Lecture, Discussion, Practice)	2	1	1
5.4	Design Evaluation Techniques- Expert Analysis; Experiential Evaluation; Evaluation through User Participation (Lecture, Discussion, Practice)	2	1	1
5.5	Professional practice, contracts, fees, negotiations, ethics and public relations. Project planning. IPR issues in Design (Lecture, Discussion, Practice)	2	-	1

Practical / Projects/Assignments:
1. To create Pixel perfect design,
2. To explain use and importance of digital artefacts.
3. Create Prototype for Production Design
4. Prepare a report of design management system.
5. Create flyer/poster/banner for an event of your choice

Suggested Readings:
1. Gail Greet Hannah, Elements of Design, Princeton Architectural Press, 2002
2. Elam, Kimberly; Geometry of Design: Studies in Proportion and Composition, Princeton Architectural Press, 2001
3. M. Bruce and R. Cooper, *Creative Product Design – A Practical Guide to Requirement Capture Management,* John Wiley and Sons, 2000.
4. K.T. Ulrich and S.D Eppinger, *Product Design and Development*, Tata Mcgraw Hill, 3rd Ed., 2004
5. M. Okley ed., *Design Management – A Handbook of Issues and Methods*, Blackwell, 1998.
6. B.L. Wadehra, *Patents and Trademarks, Copyrights, Designs and Geographical Indications;* Universal Law Publishers, New Delhi,1996.

7. S.A Chunawalla, *Project Management,* Himalaya Publishers, Mumbai, 2002.
8. H. Petroski, *Invention by Design*, Universities Press (India), 2000.

E- Resources:
1. Designing brand Identity; https://www.designingbrandidentity.info/cc1a5e88-56e9-4d1e-8a7b-f6c42c4bc43.filesusr.com/ugd/b352ef_5658460c7e064fe9b0739ab60a77751c.pdf
2. Thoughts on Developing a Design Concept; https://vanseodesign.com/web-design/design-concept-thoughts/

3 B.Sc. (GA) 4
3SEC-1: Graphics Design

| Theory | 00 | Practical | 40 | Internal | 10 | Credits | 3 |

COURSE OBJECTIVES
1. Define and interpret visual communication through Design
2. Achieve design solutions in a given context and problem
3. Use CorelDraw environment for Graphics Design
4. Use various Menu Bars and Graphic Tools of CorelDraw
5. To understand Styles and Templates, Clipart and Special Characters

COURSE OUTCOMES (CO)
1. Students can identify Design issues in Visual Communication
2. Create dynamic Graphics using Advanced Drawing and Editing tools
3. Demonstrate Good Skills in Creating Professional and Multi-page Brochures
4. Apply some effects to the Design Created, using Interactive Blend Tools
5. Conceptualize and create Logos and banner advertisement

UNIT-1	Graphics Design	L	T	P
1.1	Introduction to Graphic Design - Visual communication process, Relation between the Society and the Graphic Design (Demonstration, Discussion, Practice)	-	1	-
1.2	Principles, Elements of Design (Discussion, Practice)	-	1	1
1.3	Graphic Design- Different stages of simplification of design, Different aspects of Letter form (Demonstration, Discussion, Practice)	-	1	1
1.4	Graphic Design- Different stages of simplification of design, Different aspects of Letter form (Discussion, Practice)	-	1	1
1.5	Typography and its power for expressive qualities, Experiments in typography use, Serif, San Serif Fonts (Demonstration, Discussion, Practice, Assignment)	-	1	1

UNIT-2	Coral Draw Interface	L	T	P
2.1	Introduction to CorelDraw, Uses and Advantages, Introduction to user interface (Demonstration,, Practice, Assignment)	-	-	1
2.2	Introduction to tool panel and workplace (Discussion, Practice, Assignment)	-	1	1
2.3	Introduction to various Size and Formats of Panels and Layouts (Discussion, Practice)	-	1	1

2.4	File layouts and layout properties (Discussion, Practice)	-	1	1
2.5	Objects and using colour profile (Demonstration, Discussion, Practice)	-	1	1

UNIT-3	Text	L	T	P
3.1	Text tools and text properties creating vector Graphics by using editing tools (Demonstration, Discussion, Practice)	-	1	-
3.2	Importing images and graphics in CorelDraw layout (Demonstration, Practice, Assignment)	-	1	1
3.3	Creating shapes and Inserts, drawing curves and editing curves (Demonstration, Practice, Assignment)	-	1	1
3.4	Wedding special text effects, creating special object effects (Demonstration, Discussion, Practice)	-	1	1
3.5	Using colors effects (Practice, Assignment)	-	1	1

UNIT-4	Effect	L	T	P
4.1	Using grid and rulers, tracking images and graphics (Demonstration, Discussion, Practice)	-	1	1
4.2	Working with borders and page arrangements (Discussion, Practice)	-	1	1
4.3	Using making effects with text (Demonstration, Discussion, Practice)	-	1	1
4.4	Using making effects with objects (Discussion, Practice, Assignment)	-	1	1
4.5	Bitmap Image, Vector Image (Discussion, Practice)	-	1	-

UNIT-5	Project using Coral Draw	L	T	P
5.1	Visiting Card, Sticker, Wedding Card (Discussion, Practice)	-	1	1
5.2	Flex Banner, Brochure, Product Box Package (Demonstration, Discussion, Practice)	-	1	1
5.3	Book Cover, Newspaper advertising (Discussion, Practice)	-	1	1

5.4	Magazine Inner Page (Discussion, Practice)	-	1	1
5.5	Letterhead with Logo (Demonstration, Discussion, Practice)	-	-	1

Practical / Projects/Assignments:
1. To find out solutions to the typical design problems. Ex; Book Cover
2. To design a symbol or a logo with specific objective.
3. To take-up design problems in designing visiting cards, Letter Heads, Envelop Design, Greetings Designs Invitation Cards etc.
4. To Prepare Pamphlets, Posters, Invitation cards, Greeting cards, wrappers frame.
5. Design Advertisements, Banners and Package as assigned by subject teacher.
6. Create magazine page layout

Suggested Reading:

1. Graphic Design as Communication by Malcolm Barnard / Routledge
2. Design for Communication: Conceptual Graphic Design Basics by Elizabeth Resnick / John Wiley & Son
3. CorelDRAW X7: The Official Guide, Gary David Bouton, Corel press. . ISBN-10: 0071833145

E- Resources:
1. Li, Z., & Drew, S. (2004). Fundamentals of Multimedia [Ebook]. Pearson Education International.
   Parekh, Ranjan. (2012). 2012: Principles of Multimedia (2/e)
2. How to Use Corel Draw 12: https://www.youtube.com/playlist?list=PLlGhKy3_uBImdPZlQnqv50VytJ1J1nUui

4 B.Sc. (GA) 1
4CCC-9: Color Theory & Color Composition

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES
1. To understand the Psychopathology of everyday things and geometrical shapes
2. To Study Working of eye and Brain
3. Student will have an understanding on principles used for design
4. To explain classification of colors as per their need
5. The main emphasis is on developing an ability to create, appreciate and express creativity through various color forms

COURSE OUTCOMES (CO)
1. Differentiate the various geometrical shapes and analysis of psychology of everyday things
2. Analysis the working human Eye and Brain and its combination of working
3. They will explore a variety of design principles that are used to create any forms
4. Demonstrate the theory of color and analysis idea and application
5. Students will learn about various property and forms of color

Unit-1	Psychopathology and Creativity of Design	L	T	P
1.1	Understanding colors, Human response, Biological, Visual, Emotional, Aesthetic and Psychic response (Lecture, Discussion, Presentation)	2	-	1
1.2	Understand human response through color channels, Color that buys, color that heals etc (Lecture, Discussion, Presentation)	1	2	1
1.3	Psychology of geometrical shape such as square, rectangle, circle etc (Lecture, Discussion, Presentation)	2	2	-
1.4	Creativity as Design- Creative thinking as a skill (Lecture, Discussion, Presentation)	2	2	1
1.5	Idea Collection Processes, Brainstorming for Design/ Brain writing (Lecture, Discussion, Presentation)	2	-	-

Unit-2	Introduction to Color and Visibility	L	T	P
2.1	Overview of color (Lecture, Discussion, Presentation)	2	-	1
2.2	Sources of Radiant energy (Lecture, Discussion, Presentation)	2	2	1

2.3	Structure of human eye with parts function, Factors affecting visibility (Lecture, Discussion, Presentation)	2	2	-
2.4	Optical Filters, Various reflecting materials (Lecture, Discussion, Presentation)	2	-	-
2.5	Additive and subtractive colors, process colors (Lecture, Discussion, Presentation)	2	-	2

Unit-3	Principles of Design	L	T	P
3.1	Point and line (Lecture, Discussion)	2	-	1
3.2	Shape and Tone (Discussion, Presentation)	2	2	1
3.3	Syntax and Proportion (Lecture, Discussion, Presentation)	1	1	1
3.4	Balance, Rhythm and Harmony (Lecture, Discussion, Presentation)	2	2	1
3.5	Contrast and Unity (Lecture, Presentation)	2	-	-

Unit-4	Color Composition and Application	L	T	P
4.1	Bi-prism Theory (Lecture, Discussion)	2	-	-
4.2	Color Theory (Lecture, Presentation)	1	2	2
4.3	Color wheel (Lecture, Discussion, Presentation)	2	2	1
4.4	Classifying Color wheel (Analogous, complimentary etc) (Discussion, Presentation)	2	1	-
4.5	Characteristics of color and application (Discussion, Presentation)	2	1	-

Unit-5	Properties and Forms of Color	L	T	P
5.1	Color balance and color illusion (Lecture, Discussion, Presentation)	2	2	-
5.2	Opaque color, Transparent color, using pictorial or geometrical forms for application of a color (Lecture, Discussion, Presentation)	1	1	2

5.3	Physical properties of color, hue, Chroma, value, tints, tones and shades (Lecture, Presentation)	2	2	-
5.4	Grey scale (Lecture, Discussion)	2	1	1
5.5	Fake ,spot and Process color (Lecture, Discussion, Presentation)	2	-	-

Practical/ Projects/ Assignment:
1. Study to Use Color as a psychological tool for Brand Identity ex. Face book, yahoo etc. logo color.
2. Comparative study of advertising material in the business world.
3. Logo Design Case study for GOOGLE.
4. Understanding the various geometrical shapes and their use in today world ex. Use of paper in office as A4 with Rectangular shape rather than any other size and shape etc.
5. Understanding the use of Typography and their effect in Brand Building.
6. Design your own Logo and create a layout ex. Paper board box, magazine cover etc. and obtain critique from the audience to improve the product identity.
7. To study and examine the relationship between packaging and consumer buying behavior.

Suggested Readings:-
1. Color& Human Response: Aspects of Light and Color Bearing on the Reactions of Living Things and the Welfare of Human Beings by Faber Birren Publisher: Wiley; 1 edition (February 1, 1984) ISBN-10: 0471288640
2. Eye and Brain: The psychology of seeing by R.L. Gregory Publisher: Princeton University Press; Fifth edition (September 15, 2015) ISBN-10: 0691165165
3. Design Basics 2D and 3D – by Stephen Pentak (Author), David Lauer (Author) Publisher: Wadsworth Publishing; 8 edition (January 1, 2012) ISBN-10: 0495909971
4. Mindset: The New Psychology of Success Publisher: Ballantine Books; Rep Upd edition (December 26, 2007) ISBN-10: 0345472322
5. Visual Thinking –by Rudolf Arnheim Publisher: University of California Press; 2 edition (April 16, 2004) ISBN-10: 0520242262

E-Resources:
1. Color and Visibility: https://www.scratchapixel.com/lessons/digital-imaging/colors
2. Principles of Design: https://www.getty.edu/education/teachers/building_lessons/principles_design.pdf
3. Color Composition: https://ncert.nic.in/ncerts/l/legd104.pdf

4 B.Sc. (GA) 2
4CCC-10: 2D Animation

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES
1. To Learn The Basic Elements and Process of Animation
2. To Understand The Basic of 2D Animation
3. To Understand The Basic tools of flash
4. To Impart Knowledge of Action Script
5. To Understand Future Trends In animation Industry

COURSE OUTCOMES (CO)
1. Recognize workspace of Adobe Flash
2. Start Working on Projects and Files; Identify the Properties of Documents and Templates
3. Implement Drawing Module of Adobe Flash. They Learn Various Drawing Tools Available in Adobe Flash, Students Get Familiar with Twining
4. Recognize Exporting and Importing Videos in Adobe Flash
5. Apply Action Script, Buttons and Control Over Their Flash Contents with Scripts

UNIT-1	Introduction	L	T	P
1.1	History of Animation (Lecture, Discussion)	2	1	-
1.2	12 Principles of Animation, Concept of Stop Motion (Lecture, Discussion, Assignment)	1	1	2
1.3	Type of Animation- Puppet, Clay, Cut out, Model, Glass, Brickfilm, Graphic, Silhouette etc (Lecture, Discussion, Assignment)	2	2	1
1.4	Vector Graphics (Lecture, Discussion, Assignment)	2	-	1
1.5	Animation Software and Uses Managing the Workspace (Lecture, Discussion)	2	1	-

UNIT-2	Flash Tools	L	T	P
2.1	Selection Tool, Free Transform, Lasso Tool, Pen Tool, Text Tool Line and Rectangle Tool, Pencil Tool. (Lecture, Practice, Assignment)	2	1	2
2.2	Brush tool- Brush Mode, Ink Bottle and Paint Bucket Tool, Eyedropper and Eraser Tool (Lecture, Practice, Assignment)	1	1	2

2.3	Timeline and Key frames, Frame-by-frame Animation, Importing Files (Lecture, Practice, Assignment)	2	1	2
2.4	Grouping Elements, Modify Objects (Lecture, Practice, Assignment)	1	-	1
2.5	Working with Layers- Creating New Layers and Deleting Layers, Lock and Hide Layers (Lecture, Practice, Assignment)	1	-	1

UNIT-3	**Tweening and Colors**	**L**	**T**	**P**
3.1	Tweening- Classic Tween, Motion Tween, Shape Tween (Lecture, Practice, Assignment)	2	1	2
3.2	Color in Flash- Swatches Panels (Lecture, Practice)	1	1	-
3.3	Color Models RGB, HSV (Lecture, Assignment)	2	-	2
3.4	Color Gradients, Alpha channel (Lecture, Practice, Assignment)	1	1	1
3.5	Flash Bitmap Tracing, Motion Presets (Lecture, Practice, Assignment)	1	1	2

UNIT-4	**Symbols, Effect And Filters**	**L**	**T**	**P**
4.1	Working With Symbols- Graphic Symbols, Movie Clip Symbols, and Button Symbols (Lecture, Practice, Assignment)	2	1	2
4.2	Masking, Flash inverse kinematics (Lecture, Discussion, Practice)	2	-	1
4.3	Flash Effects (Lecture, , Discussion, Practice)	2	-	1
4.4	Flash Filters (Lecture, , Discussion, Practice)	2	-	1
4.5	Flash sound- sound formats supported by Flash, Add sound (Lecture, , Discussion, Practice)	2	-	2

UNIT-5	Action Script	L	T	P
5.1	Action Script 2.0 and 3.0 (Lecture, Practice)	2	1	-
5.2	Basic Programming Concepts – Variable, Constants (Lecture, , Discussion, Practice)	1	1	-
5.3	Data Types, Operators (Lecture, Practice)	2	-	2
5.4	Conditional Statement and Looping Statement (Lecture, , Discussion, Practice)	2	-	2
5.5	Creating Buttons & Setting Button States (Lecture, , Discussion, Practice)	2	1	2

Practical /Project/Assignments

1. Move Object From One Place To Another, Change Color of Object
2. Animate Rain Using Flash
3. Animate Butterfly Using Transform Tool
4. Flash Analog Clock Using Action Script3.0
5. Create Artwork Using Pen Tool
6. Create Play, Pause, Stop Button Using Action Script

Suggested Readings:

1. Sheila Graber, "Animation: A Handy Guide", Barron Publication, 2009
2. Satish Jain, "Adobe Flash Professional CS6 Training Guide", BPB Publications, 2016
3. Ellen Finkelstein and GurdyLeete,"Flash CS3 for Dummies", Dummies, 2007
4. William Heldman , "Adobe Flash Professional CS6 Essentials"Sybex; 1 edition, 2012

E-Resources:

1. http://edutechwiki.unige.ch/en/Flash_frame-by-frame_animation_tutorial
2. http://saintangelos.com/studentdesk/Download/FLASH%20.pdf
3. http://www.flashkit.com/tutorials/
4. http://archive.svsd410.org/directory/_dockeryj/conferences/flash/animation.html

4 B.Sc. (GA) 3
4CCE-3: Game Design

Theory	80	Practical	00	Internal	20	Credits	6

COURSES OBJECTIVES

1. Goals are fundamental to games; they determine what the player has to do to win the game, and give the player a sense of accomplishment and progression
2. Goals are what a player reaches for in the game and they are traditionally quantifiable
3. Goals in a game can set the tone in a game and can also be adjusted to generate particular behaviors, actions, and feelings in a game
4. how the game mechanics support these goals
5. The learning goals, game goals, and the content should be structured in a way that allows for a progressive comprehension of the content of the game

COURSE OUTCOMES (COs)

1. Apply the appropriate skills necessary for proper project production planning and management of computer and video games
2. Deploy a comprehensive knowledge of the historical, cultural, sociological and psychological aspects of computer games to engage with an audience
3. Lead or participate in an interdisciplinary team-oriented game production project
4. Engage with gaming industry best practices to enable and entrepreneurial position in the gaming marketplace
5. Organization and implementation of testing during game development

UNIT-1	Introduction of Game Design	L	T	P
1.1	Origin and Growth of Gaming Industry and Digital Gaming, Principles of Game Design (Lecture, Discussion, Assignment)	3	1	-
1.2	The Anatomy of Game Design, The Importance of Game Design, Key Elements of Games, Ground Rules (Lecture, Discussion, Assignment)	3	1	-
1.3	Documenting the Design, Need for Documents, The Types of Design Documents (Lecture, Discussion, Assignment)	3	-	-
1.4	Anatomy of a Game Designer – Imagination, Technical Awareness, Analytical Competence, Mathematical Competence (Lecture, Discussion, Assignment)	3	1	-
1.5	Aesthetic Competence, General Knowledge, Writing Skills, Drawing Skills, The Ability to Compromise (Lecture, Discussion, Assignment)	3	-	-

UNIT-2	Elements of Game	L	T	P
2.1	Game concepts, Formal elements of games	3	1	-

	(Lecture, Discussion, Assignment)			
2.2	The Elements of a Game - Games, Toys, and Puzzles, Challenges (Lecture, Discussion, Assignment)	**3**	**-**	**-**
2.3	Game play and the Victory Condition. Setting (Lecture, Discussion, Assignment)	**3**	**1**	**-**
2.4	Interaction Model, and Perspective, The Players Role (Lecture, Discussion, Assignment)	**3**	**-**	**-**
2.5	Modes and Structure, Realism (Lecture, Discussion, Assignment)	**3**	**1**	**-**

UNIT-3	**Game Machines and Dimensions**	**L**	**T**	**P**
3.1	Game as an Interactive Entertainment (Lecture, Discussion, Assignment)	**3**	**-**	**-**
3.2	Game Machines - Home Game Consoles, Personal Computers Handheld Game Machines, Other Devices (Lecture, Discussion, Assignment)	**3**	**1**	**-**
3.3	The Purpose of a Game Setting (Lecture, Discussion, Assignment)	**3**	**-**	**-**
3.4	The Dimensions of a Game World - The Physical Dimension, The Temporal Dimension (Lecture, Discussion, Assignment)	**3**	**1**	**-**
3.5	The Environmental Dimension, The Emotional Dimension, The Ethical Dimension. Realism and Abstraction (Lecture, Discussion, Assignment)	**3**	**1**	**-**

UNIT-4	**Game Storytelling and Character development**	**L**	**T**	**P**
4.1	Storytelling and Narrative, Stories in Games (Lecture, Discussion, Assignment)	**3**	**-**	**-**
4.2	The Story Vehicle - Plot Pacing, Game play and Narrative, Multi-Part Stories (Lecture, Discussion, Assignment)	**3**	**1**	**-**
4.3	Storytelling and Narrative Worksheet (Lecture, Discussion, Assignment)	**3**	**1**	**-**
4.4	Character Development - Art-Driven Character Design (Lecture, Discussion, Assignment)	**3**	**-**	**-**
4.5	Story-Driven Character Design, Character Development Worksheet (Lecture, Discussion, Assignment)	**3**	**1**	**-**

UNIT-5	User Experience and Game play	L	T	P
5.1	Creating the User Experience - Interactive Element (Lecture, Discussion, Assignment)	3	-	-
5.2	Visual Element, Audio Element (Lecture, Discussion, Assignment)	3	1	-
5.3	The Human-Computer Interface, Components of the User Experience (Lecture, Discussion, Assignment)	3	1	-
5.4	Game play - Use of Language, Defining Game play, Game play Worksheet (Lecture, Discussion, Assignment)	3	1	-
5.5	Game Balance - Static Balance v/s Dynamic Balance, Tools for Balancing (Lecture, Discussion, Assignment)	3	-	-

Practical / Projects/Assignments:
1. To prepare a Game structure.
2. To develop a Game story
3. To create a worksheet of Game Design
4. To create character design
5. To prepare interactive element as user experience

Suggested Readings:

1. Fundamentals of Game Design by Ernest Adams, ISBN-10 : 0321929675, ISBN-13 : 978-0321929679, Publisher: New Riders; 3rd edition
2. The Art of Game Design, 3rd Edition by Jesse Schell, Released July 2019, Publisher(s): A K Peters/CRC Press, ISBN: 9781351803632
3. Game Mechanics: Advanced Game Design Ernest Adams and Joris Dormans New Riders Games, ISBN-13: 978-0-321-82027-3, ISBN-10: 978-0-321-82027-4

E-Resource:

1. Game Mechanics, Advanced Game Design; https://www.pdfdrive.com/game-mechanics-advanced-game-design-d33516475.html
2. Game Design: Theory & Practice 2nd Edition; https://www.pdfdrive.com/game-design-theory-practice-2nd-edition-d8793769.html

4 B.Sc. (GA) 3
4CCE-4: Video Editing

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES
1. Comprehend basic Video Editing types, terminology and concepts
2. To acquire a basic working understanding of video editing equipments and setup
3. Understand pipeline of nonlinear video-editing application (Adobe Premiere Pro)
4. Understand pipeline of nonlinear video-editing application (Final Cut Pro)
5. Acquire knowledge of color correction and grading

COURSE OUTCOMES (CO)
1. Recognize types and process of different video editing
2. Identify theoretical, aesthetic and technical aspects of video editing
3. Perform basic editing function of Adobe Premiere Pro
4. Perform basic editing function of Final Cut Pro
5. Demonstrate use of color grading and color correction for a video production

UNIT-1	Basic Concepts of Video Editing	L	T	P
1.1	Concept of Video Editing : Need and Importance, Manipulating Time and Space with Video Editing (Class room lecture, Video Demonstration and PPT)	2	1	1
1.2	Principles of Video Editing (Action, Sequence, Cross cutting, Parallel, Continuity) (Class room lecture, Video Demonstration and PPT about basic principles)	2	1	1
1.3	Linear and Non-Linear Editing, Offline and Online Editing (Class room lecture and PPT)	2	-	1
1.4	L-cut, J-cut, Jump cut, Match cut, Invisible cut Superimposition, Compositing, Keying (Class room lecture, Video Demonstration and PPT)	2	1	1
1.5	Basic Editing techniques (Continuity, matching, overlapping, composition, Rule of 180 Degree) (Class room lecture, Video demonstration, assignments and PPT)	1	1	1

UNIT-2	Editing Equipments and Setup	L	T	P
2.1	Editing equipment - recorder, player, video switcher, vision mixer, audio mixer, monitor, and speaker (Class room lecture, PPT and demonstration in studio)	2	1	2
2.2	NLE Editing Setup (VTR, Fire wire, DV Tape, SD Card, Audio Monitor, System, Software's) (Class room lecture, demonstration and PPT)	1	2	1
2.3	Import & Capturing process (Import Setting, Sequence Setting, Scratch disk setting) (Class room lecture and demonstration)	2	1	1
2.4	Logging , Digital Video Log sheet (Class room lecture, demonstration and PPT)	2	-	1

2.5	Edit Decision List, Aspect Ratio, Resolution, Video file formats (MP4, AVI, MOV, FLV, 3GP, WMV etc) (Class room lecture, demonstration and PPT)	1	-	1

UNIT-3	Video Editing Software (Adobe Premiere)	L	T	P
3.1	Introduction to Adobe Premiere (Class room lecture, demonstration and PPT)	2	-	2
3.2	Project settings, Tool and Interface (Class room lecture, demonstration and PPT)	1	-	2
3.3	Video Transitions and their applications Tracks, Video Effects and their applications (Class room lecture, demonstration and PPT)	1	-	2
3.4	Motion and Key-frames, Titling & Graphics (Class room lecture, demonstration and PPT)	2	-	2
3.5	Integrating Photoshop with Premiere, Export Setting & Publishing Options (Class room lecture, demonstration and PPT)	2	-	2

UNIT-4	Video Editing Software (Final Cut Pro)	L	T	P
4.1	Introduction to Final Cut Pro & Mac Interface (Class room lecture, demonstration and PPT)	2	-	2
4.2	Project settings, Tool and Interface (Class room lecture, demonstration and PPT)	2	-	2
4.3	Video Transitions and their applications Tracks, Video Effects and their applications (Class room lecture, demonstration and PPT)	2	-	2
4.4	Motion and Key-frames, Titling & Graphics (Class room lecture, demonstration and PPT)	1	-	2
4.5	Export Setting & Publishing Options (Class room lecture, demonstration and PPT)	1	-	2

UNIT-5	Color Corretion, Grading & Publishing	L	T	P
5.1	Importance of Color Theory in Video, Correction and Grading (Class room lecture, PPT, demonstration and assignments)	1	-	2
5.2	Options available in Premiere (Lumetri) and Final Cut Pro (Color Board), LUT Presets (Look Up Table) (Class room lecture, demonstration and assignments)	1	-	2
5.3	Introduction to Color Grading Options – DaVinci Resolve, Red Giant Magic Bullet etc (Class room lecture, PPT, demonstration and assignments)	2	-	1
5.4	Exporting project (Export pre – sets, Custom pre set, Frame rate, frame size, pixel, bit rate and audio format, work bar selection and entire timeline) (Class room lecture, PPT, demonstration and assignments)	2	2	1
5.5	Publishing for different platforms (Class room lecture, PPT, demonstration and assignments)	2	-	2

Practical/Projects/Assignments:
1. Create a Infographic PSA in Premiere
2. Create a Commercial promo in Premiere
3. Create a logo animation in Premiere
4. Create a Infographic PSA in FCP
5. Create a Commercial promo in FCP
6. Create a logo animation in FCP

Suggested Readings:

1. Handbook of Television Production: Herbet Zettl. 7th ed. Wadsworth
2. Video Basic Workbook. Herbert Zettl. 2nd ed. Wadsworth
3. The Technique of Television Production: Gerald Millerson, 12th ed. Focal Press, London, 1990.
4. A Guide to Production Techniques: Nick Dimbleby, Richard Dinberly and Ken Whittington. Practical Media:, Holder & Stoughton, London, 1994.
5. Television Production: Alan Wurtze. 2nd Edition. Mcgraw Hill Book company New York
6. Video Production:Vasuki Belavadi. 2nd Edition, Oxford university press

E-Resource:

1. https://helpx.adobe.com/in/support/premiere-pro.html
2. https://helpx.adobe.com/in/premiere-pro/tutorials.html
3. https://www.lynda.com/

7.

4 B.Sc. (GA) 4
4SEC-2: Visual Communication & Media

| Theory | 00 | Practical | 40 | Internal | 10 | Credits | 3 |

COURSE OBJECTIVES
1. To understand the basics of communication
2. To understand the visual communication practice
3. Correlate the uses and strategies for visual perception & illusions
4. To apply the techniques in visual media
5. To develop students about significance of visual ideas & creativity

COURSE OUTCOMES (CO)
1. Know the various theoretical and practical aspects of communication
2. Describe the visual communication and its practice
3. Implement the Uses and Strategies for visual perception & illusions
4. Assess their Soft Skills for visual media
5. Generate their skills for visual communication

UNIT-1	Importance of Communication and Storytelling	L	T	P
1.1	Need & Importance of Human and Visual Communication (Lecture, Discussion, Practical)	-	1	-
1.2	Scope, Functions &Characteristics of Communication (Lecture, Participation)	-	1	1
1.3	Understanding & Process of Communication (Lecture, Discussion, Practical)	-	1	1
1.4	Introduction to Narrative Theory and Storytelling in Moving Images (Lecture, Discussion)	-	1	1
1.5	Elements and Rules of Storytelling, Character Importance (Lecture, Quiz)	-	1	1

UNIT-2	Basics of Visual Communication	L	T	P
2. 1	Visual Communication- Definition & Concept, Historical Development of Visual Communication (Lecture, Discussion, Practical)	-	1	-
2.2	Nature, Functions & Characteristics of Visual Communication (Lecture, Quiz, Assignment)	-	1	1

2.3	Types of Visual Communication- Graphic Design, Art, Photography &Multimedia (Lecture, Assignment)	-	1	1
2.4	Advantages & Disadvantages of Visual Communication (Lecture, Discussion, Practical)	-	1	1
2.5	Visual Communication Techniques- Eye Contact, Hand Gesture & Body Language etc (Lecture, Assignment)	-	1	1

UNIT -3	Visual Perception & Illusions	L	T	P
3.1	Types of Perception- Visual Perception & Graphical Perception(Lecture, Assignment)	-	1	-
3.2	Illusions- Definition & Basics (Lecture, Discussion, Practical)	-	1	1
3.3	Types of Illusion- Visual Illusion, Perspective Illusions, Geometric Illusions, Colour & Irradiation Illusions (Lecture, Discussion)	-	1	1
3.4	Gestalt theory- Definition & Concept (Lecture, Discussion, Practical)	-	1	1
3.5	Gestalt Principles- Similarity, Continuation, Closure, Proximity, Figure and Ground (Lecture, Discussion)	-	1	1

UNIT-4	Visual Principles & Design	L	T	P
4.1	Principles of Visual (Lecture, Discussion)	-	1	-
4.2	Color Psychology and Theory (some aspects) Definition, Optical / Visual Illusions etc (Lecture, Assignment , In Class Exercise)	-	1	1
4.3	Various Stages of Design Process- Problem Identification Search for Solution Refinement, Analysis, Decision Making, Implementation (Lecture, Discussion)	-	1	1

4.4	Fundamentals of Design: Definition. Approaches to Design, Centrality of Design (Lecture, Discussion, Practical)	-	1	1
4.5	Elements& Principles of Design (Lecture, Discussion)	-	1	1

UNIT-5	Visual Ideas & Creativity	L	T	P
5.1	Design Process Research, Source of Concept (Lecture, Discussion)	-	1	1
5.2	Process of Developing Ideas -Verbal, Visual, Combination & Thematic, Visual Thinking etc (Lecture, Discussion)	-	1	1
5.3	Observation and Practical, Ideation- Definition & Concept (Lecture, Discussion)	-	1	1
5.4	Creativity- Definition, Concept Characteristics & Process of Creativity (Lecture, Discussion, Practical)	-	1	1
5.5	Creativity Tools &Approaches to Creativity (Lecture, Discussion)	-	1	-

Practical/ Projects/ Assignment:
1. Write an article on Visual Communication.
2. You will create photo illustrations to represent a specific viewpoint and write about an ethics issue.
3. Analyze a brand's visual identity and then create a set of icons to visually represent the brand's values.
4. Practice toning photos in Photoshop, meaning that you'll make adjustments to exposure and color balance.
5. Create a blog for your professional visual work.

Suggested Readings:
1. Seema Hasan (2010). Mass Communication- Principles & Concepts, First Edition,
2. Lester, E (2000) Visual Communications: Images with Messages. Thomson Learning
3. Schildgen, T (1998). Pocket Guide to color with digital applications. Thomsom Learning
4. Picture this: Media Representation of Visual Arts and artists. University of Luton Press
5. Palmer, Frederic: Visual Elements of Art and Design,1989, Longman
6. Porter, Tom and Goodman, Sue: Manual of Graphic Technique 2: For Architects,
7. Graphic Designers, and Artists,1982, Astragal Books. London

8. Palmer. F: Visual Awareness (Batsford, 1972)

E-Resources:
1. Visual Communication: https://visme.co/blog/visual-communication/
2. Perception & Illusions of Visual: https://michaelbach.de/ot/
3. Visual Principles & Design: https://helveticamediuma.com/learn/design-elements-principles/
4. Visual Ideas & Creativity : https://visme.co/blog/creative-presentation-ideas/

5 B.Sc. (GA) 1
5CCC-11: Augmented and Virtual Reality

Theory	50	Practical	30	Internal	20	Credits	6

COURSES OBJECTIVES
1. To understand the basics of AR and VR
2. To understand the basics of AR VR Input Devices
3. To learn basic features of Tactile and Force Feedback Devices
4. To learn application of AR VR devices in different area
5. To understand the future of AR VR and its different aspects

COURSES OUTCOMES (CO)
1. Student would aware of fundamentals of AR and VR
2. Student would aware of AR VR Input Devices and its working
3. Student can work with different AR VR Input Devices
4. Student can work with different AR VR devices in different field
5. Student can imagine future of AR VR in different fields

UNIT-1	Introduction to AR and VR	L	T	P
1.1	Computer Generated Worlds, Introduction of Augmented Reality (Lecture, Tutorial)	2	1	-
1.2	Introduction of Virtual Reality, Understanding Virtual Space (Lecture, Tutorial)	2	2	-
1.3	Defining Visual Space and Content (Lecture, Tutorial)	2	2	-
1.4	Defining Position and Orientation in Three Dimensions (Lecture, Tutorial)	2	2	-
1.5	Navigation (Lecture, Tutorial)	2	1	-

UNIT-2	Input/ Output Devices- I	L	T	P
2.1	Technologies of Head-Mounted Displays (Lecture, Practical, Demonstration)	2	1	1
2.2	Augmenting Displays (Lecture, Practical, Demonstration)	2	1	1
2.3	Fully Immersive Displays (Lecture, Practical, Demonstration)	1	1	1
2.4	The Mechanics of Hearing	1	1	1

	(Lecture, Practical, Demonstration)			
2.5	Audio Displays (Lecture, Practical, Demonstration)	**2**	**1**	**1**

UNIT-3	**Input/ Output Devices- II**	**L**	**T**	**P**
3.1	The Mechanics of Feeling (Lecture, Practical, Demonstration)	**1**	**1**	**1**
3.2	Tactile Feedback Devices (Lecture, Practical, Demonstration)	**1**	**1**	**1**
3.3	Force Feedback Devices (Lecture, Practical, Demonstration)	**1**	**1**	**1**
3.4	Sensors for Tracking Position, Orientation, and Motion (Lecture, Practical, Demonstration)	**3**	**1**	**1**
3.5	Devices to Enable Navigation and Interaction (Lecture, Practical, Demonstration)	**2**	**1**	**1**

UNIT-4	**Applications of AR and VR**	**L**	**T**	**P**
4.1	Architecture and Construction, Science and Engineering (Lecture, Tutorial, Demonstration)	**3**	**1**	**-**
4.2	Gaming and Entertainment, Graphics (Lecture, Tutorial, Demonstration)	**2**	**1**	**-**
4.3	Health and Medicine, Aerospace and Defense (Lecture, Tutorial, Demonstration)	**3**	**1**	**-**
4.4	Education, Information Control and Big Data Visualization (Lecture, Tutorial, Demonstration)	**3**	**1**	**-**
4.5	Telerobotics and Telepresence, Media and Journalism (Lecture, Tutorial, Demonstration)	**2**	**1**	**-**

UNIT-5	**Future and different Aspects of AR and VR**	**L**	**T**	**P**
5.1	The Future of AR and VR (Lecture, Tutorial)	**2**	**2**	**-**

5.2	Human Factors Considerations (Lecture, Practical, Demonstration)	2	1	-
5.3	Legal Considerations (Lecture, Tutorial)	2	2	-
5.4	Social Considerations (Lecture, Tutorial)	2	1	-
5.5	Moral and Ethical Considerations (Lecture, Tutorial)	2	2	-

Practical/Project/Assignments:
1. Work and understand the Technologies of Head-Mounted Displays
2. Work and understand the Technologies of Tactile Feedback Devices
3. Work and understand the Technologies of Force Feedback Devices
4. Work and understand the Technologies of Fully Immersive Displays
5. Work and understand the Technologies of Augmenting Displays

Suggested Readings:

1. Gerard Jounghyun Kim, Designing Virtual Reality Systems, the Structured Approach, Springer London, 2005
2. Grigore C Burdeaabd Philippe Coiffet, Virtual Reality Technology, 2nd Eds., Wiley Interscience, 2003
3. John Vince, Introduction in Virtual Reality, Springer, 2004
4. Alan B Craig, William R Sherman and Jeffrey D Will, Developing Virtual Reality Applications: Foundations of Effective Design, Morgan Kaufmann, 2009
5. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, 3D User Interfaces, Theory and Practice, Addison Wesley, USA, 2005
6. Oliver Bimber and Ramesh Raskar, Spatial Augmented Reality: Meging Real and Virtual Worlds, 2005
7. Burdea, Grigore C and Philippe Coiffet, Virtual Reality Technology, Wiley Interscience, India, 2003
8. Alan B. Craig, Understanding Augmented Reality, Concepts and Applications, Morgan Kaufmann, 2013

E Resources:
1. https://www.forbes.com/sites/bernardmarr/2019/07/19/the-important-difference-between-virtual-reality-augmented-reality-and-mixed-reality/#7a539db335d3
2. https://in.pcmag.com/consumer-electronics/109911/augmented-reality-ar-vs-virtual-reality-vr-whats-the-difference
3. https://edu.gcfglobal.org/en/thenow/understanding-virtual-reality-and-augmented-reality/1/

5 B.Sc. (GA) 2
5CCC-12: Visual Effects

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES

1. Learn the important principles and tools of modern visual effects
2. Learn the history and development of modern techniques
3. Understand the fundamentals of After Effects
4. Explore the interface of After Effects and identify the compositing tools
5. Applying the tools for creation of visual effects

COURSE OUTCOMES (CO)

1. Understanding the essential principles of visual effects
2. Identifying the relevant VFX techniques required to be used in different situations
3. Analyze visual effects in animation, movies
4. Clarity in VFX workflow pipeline
5. Applying After Effects tools to create visual effects

UNIT-1	Introduction	L	T	P
1.1	Fundamentals of Visual Effects (VFX) (Lecture, Discussion)	2	-	-
1.2	Photographic principles, Forced perspective: theory (Lecture, Discussion)	2	-	1
1.3	Visual Effects Hardware (Lecture)	2	1	-
1.4	Visual Effects Software - Adobe After Effects, 3Ds Max, Cinema 4D –Maxon, Maya, Flame Autodesk, Boujou, Nuke, Mocha (Lecture)	2	1	2
1.5	Visual EffectsVs Computer Generated Imagery (Lecture, Practice)	2	1	2

UNIT-2	VFX Tools and Techniques-1	L	T	P
2.1	Rotoscoping (Lecture, Practice)	2	1	1
2.2	Compositing (Lecture, Practice)	2	-	2
2.3	Matte Paintings (Lecture, Practice)	2	1	1
2.4	Rigging , Digital Sculpture (Lecture, Practice)	2	1	-
2.5	Motion Capturing (Lecture, Practice)	2	-	1

UNIT -3	VFX Tools and Techniques-2	L	T	P
3.1	Special Vs Visual Effects, Basic tools Rear Projection , Stop Motion Animation (Lecture, Practice)	2	-	2
3.2	Planning a visual effect – Storyboards, pre-viz, Planning work flows (Lecture, Practice)	1	-	2
3.3	Modern tools Models, Miniatures, Green Screen, Motion Control (Lecture, Practice)	1	1	2
3.4	The VFX Pipeline - Planning & Management. Job specialization (Lecture, Practice)	1	-	2
3.5	Computer Generated Images. Motion Capture, Performance capture (Lecture, Practice)	1	-	3

UNIT-4	After Effects -1	L	T	
4.1	After Effects –Interface (Lecture, Practice)	2	-	2
4.2	Basic Animation. Basic Rendering (Lecture, Practice)	2	1	2
4.3	Advanced Animation Anchor point, Key frames, Motion Sketch (Lecture, Practice)	2	-	2
4.4	Transparency –Masks, Pen tool, Painting, Puppet (Lecture, Practice)	2	-	-
4.5	Time & Layer control (Lecture, Practice)	2	-	1

UNIT-5	After Effects-2	L	T	P
5.1	Setting up a composition (Lecture, Practice, Assignment)	1	1	2
5.2	Working with layers (Lecture, Practice, Assignment)	2	-	2
5.3	Animating compositions (Lecture, Assignment, Practice)	2	1	2
5.4	Applying effects, including lights (Lecture, Practice, Assignment)	1	-	-
5.5	Working in 3D, Rendering project (Lecture, Practice, Assignment)	2	1	1

Practical/Projects/Assignments:

1. Create Matte Paintings
2. Explore Create Stunts, explosions, water, fire – safety
3. Modern tools Models, Miniatures, Green Screen, Motion Control
4. Plan VFX Pipeline - Planning & Management. Job specialization
5. Creating a Basic animation using effects and Pre-sets
6. Working with shape Layers
7. Building 3D objects
8. Polishing and Finishing Portfolio

Suggested Readings:

1. The Filmmaker's Guide to Visual Effects: The Art and Techniques of VFX for Directors, Producers, Editors and Cinematographers Paperback –2017, by Eran Dinur
2. The Visual Effects Producer: Understanding the Art and Business of VFX Paperback –2009 by Charles Finance, Susan Zwerman
3. Visual Effects and Compositing Paperback – Import, 2014 by Jon Gress
4. The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures Paperback –2014 by Jeffrey A. Okun VES (Editor), Susan Zwerman VES

E-Resources:

1. After Effects Apprentice - Real World Skills for the Aspiring Motion Graphics Artist, Publisher: Focal Press; 3rd edition (August 23, 2012), ISBN-13: 978-0240817361
2. https://www.oscars.org/sites/oscars/files/complete_visual_effects_activities_guide.pdf
3. The VES handbook of Visual Effects 2010 Visual Effects Society. Published by Elsevier Inc available at http://www.varmstudio.com/stuff/miisu/VES.pdf

5 B.Sc. (GA) 3A
5CCE-5: 3D Design with Max

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES

1. To teach students the essentials of working in 3D using an array of features and tools
2. Design and Synthesis Inorganic Models Using Polygonal Modeling Techniques
3. Characterize Texture the Models using Advanced Mapping Techniques
4. Create Realistic 3D Models and Textures
5. Describe 3D Product Lighting and Mental Ray Rendering for Product Presentation

COURSE OUTCOMES (CO)

1. Design 3D Model Objects Using a Variety of Techniques
2. Demonstrate a Critical Understanding of a Range of Specialised Principles and Concepts of 3D Modelling for Visualisation from Real-World Data Acquired
3. Create and Execute a Visualisation Project, from Acquisition of 3D Data from Photogrammetric Through to the Preparation of a Finished 3D Model for a Range of End-User Applications
4. Implement and evaluate a Range of Software to Support and Enhance 3D Modelling Work
5. Critically Review, Consolidate and Extend Skills in 3D Modelling and Animation

UNIT-1	Introduction of 3D & 3D MAX	L	T	P
1.1	Definition of 3D Design, Hardware and software technical specification (Lecture, Discussion)	1	1	-
1.2	3ds Max : interface, Terms and concepts, view Port , screen layout, menu bar, main tool bar (Lecture, Discussion)	1	1	2
1.3	Command panel, create panel, modify panel (Lecture, Practice, Assignment)	1	1	2
1.4	Hierarchy panel, motion panel (Lecture, Discussion)	1	1	2
1.5	Display panel, utilities panel (Lecture, Discussion, Assignment)	1	1	2

UNIT-2	Polygon Modeling	L	T	P
2.1	Working with primitive polygon objects, creating box and sphere, creating prism (Lecture, Discussion, Assignment)	1	-	2
2.2	Modifying primitive, selecting object : name, color, region, transforming objects (Lecture, Assignment)	1	-	2
2.3	Coordinate system in 3d max, transform Gizmos , moving an object,	1	1	2

	rotating an object (Lecture, Practice, Assignment)			
2.4	Scaling an object, Hiding and freezing an object (Lecture, Discussion, Practice)	**1**	**1**	**2**
2.5	Cloning objects, grouping objects, Mirroring objects, Aligning objects (Lecture, Discussion, Practice, Assignment)	**1**	**1**	**2**

UNIT-3	Subdivision Modeling	L	T	P
3.1	Basic modeling techniques (Lecture, Assignment)	**1**	**-**	**2**
3.2	Introduction to modifiers, modifiers types, modifier stack, using various modifiers (Lecture, Practice, Assignment)	**1**	**1**	**2**
3.3	Working with 2d Shapes, shapes primitive (Lecture, Practice)	**1**	**-**	**2**
3.4	3D object, Using the Graphite Modelling tool, materials, Properties of materials , Modifier, Modelling concepts (Lecture, Practice, Assignment)	**1**	**1**	**2**
3.5	Exploring NURBS Modelling, Creating a NURBS Curve Sub Object, Converting object to NURBS, Editing NURBS (Lecture, Discussion, Practice, Assignment)	**1**	**1**	**2**

UNIT-4	Texturing	L	T	P
4.1	Mesh Object and Sub Object, Exploring Subdivision Modeling (Lecture, Discussion)	**1**	**1**	**-**
4.2	Applying the mesh smooth modifier, Applying the Turbo smooth modifier (Lecture, Practice)	**1**	**1**	**2**
4.3	Exploring Polygonal modelling, Creating Mesh Object, Converting and object into an Editable poly object, Collapsing an object (Lecture, Discussion, Practice, Assignment)	**1**	**1**	**2**
4.4	Advanced Materials, Subsurface Scattering, Texture Map, Layered Texture (Lecture, Practice, Assignment)	**1**	**1**	**2**
4.5	Human Anatomy UV Coordinates Setup for Texturing, Maps - Color Maps, Bump Maps, Displacement Maps, Normal Maps, Specular Maps, Mask Maps, Occlusion map (Lecture, Discussion, Practice, Assignment)	**1**	**1**	**2**

UNIT-5	Lighting and Rendering	L	T	P
5.1	Basic concepts of lighting, Properties of light (Lecture, Practice)	1	-	2
5.2	Shadows and Cameras, Light Types: Omni, Spot, Directional, Creating Lights, Changing Light, Types, Creating a Sunlight System, Adjusting Illumination, On/Off (Lecture, Practice, Assignment)	1	1	2
5.3	Exclusion, Intensity, Color, Hotspot and Falloff, Attenuation, Decay, Projector Maps, Volumetric Lighting, Casting Shadows, On/Off, Shadow Types, Shadow Color, Light Placement (Lecture, Discussion, Practice)	1	1	2
5.4	Light Viewport Controls, Animating Lights, Camera Types, Target, Free, Creating Cameras, Aiming Cameras, Changing, Camera Types, Activating a Camera View, Adjusting Cameras, Focal Length, Field of View (Lecture, Discussion, Practice, Assignment)	1	-	2
5.5	Clipping Planes, Environment Ranges, Camera Placement, 3d Rendering and Rendering methods (Lecture, Discussion, Practice)	1	1	2

Practical / Projects/Assignments:
1. Design various Model (Interior exp: Lamp, Table etc)
2. Design various Model (Exterior exp: Ball, Helicopter etc)
3. Create Animation with 3D Model
4. Apply of Light and Texture for 3D Design
5. Any other Assignment given by the concerned faculty

Suggested Readings:
1. Introducing 3ds Max 3D for Beginners by Dariush Derakhshhani, SYBEX (2003)
2. 3ds Max 2010 IN Simple Steps, by Kogent Learning Solution Inc, Dreamtech Press
3. 3D Max Bible (2006)
4. Kelly L. Murdock, 3ds max TM 4 Bible, John Wiley & Sons

E- Resources:
1. Autodesk's 3ds Max; https://www.creativebloq.com/features/10-top-3ds-max-tutorials
2. 3Ds Max from Scratch; https://www.arch2o.com/learn-3ds-max/

5 B.Sc. (GA) 3B
5CCE-6: 3D Design with MAYA

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES

1. To provide a solid understanding on the concept and usage of Autodesk Maya
2. Create and manipulate 3D assets in the application
3. Utilize appropriate content and techniques to Conceptualization on our storyboard
4. Bring 3D objects to life by using Maya's animation tools
5. Understand the production pipeline and workflows used in the industry

COURSE OUTCOME (CO)

1. Produce 3D models from a sketch, storyboard
2. Perform Feature and function of Maya software
3. Demonstrate any idea for 3DAnimation
4. Generate lighting and Visual Effects in Animation
5. Recognize gaming & animation pipeline

UNIT-1	Introduction to Maya	L	T	P
1.1	Maya Interface (Class room lecture and PPT)	1	1	-
1.2	Maya Interface, Vertices, Lines, Polygons, Polygon Faces (Class room lecture and PPT about basic principles)	-	2	2
1.3	Creating a Scene, Manipulating a Scene in 3D (Class room lecture and PPT)	2	1	-
1.4	Texturing an Object (Class room lecture and PPT)	1	1	2
1.5	Lighting a Scene, Rendering a Still Frame (Class room lecture and PPT)	2	1	2

Unit-2	Modeling & Texturing	L	T	P
2.1	Basic of modeling, Modeling with NURBS & polygon (Class room lecture, PPT and demonstration in studio)	1	1	2
2.2	Attaching surfaces, Rebuilding Surfaces, Textures Coordinates (Class room lecture, demonstration and PPT)	1	1	2
2.3	Polygon Modeling and Texturing - Modeling with Polygon Tools (Class room lecture, demonstration and PPT)	1	-	2
2.4	Working with Symmetry, Using Image Planes, Block Modeling (Class room lecture and demonstration)	1	-	2
2.5	Sculpturing Polygon Objects, UV Texturing, Paint Effects, Material's Hyper shade (Class room lecture, demonstration and PPT)	1	1	2

UNIT-3	Rigging & Animation	L	T	P
3.1	Creating the Skeleton, Using Deformers (Class room lecture, demonstration and assignments)	1	1	2
3.2	Constrain and utility's, Set driven key Connection editor,	1	1	2

	Creating a rig using IK FK (Class room lecture, PPT, demonstration)			
3.3	Animation principles, Graph editor (Class room lecture, PPT, demonstration)	1	1	-
3.4	Animating objects along paths, Play blast, Ball bouncing (Class room lecture, PPT, demonstration in studio)	1	1	2
3.5	Walk cycle (Class room lecture, PPT, demonstration)	1	1	2

UNIT-4	**Dynamic Effects**	**L**	**T**	**P**
4.1	Particle properties (Class room lecture, PPT, demonstration and assignments)	1	1	2
4.2	Fluids dynamics (Class room lecture, demonstration and assignments)	1	1	2
4.3	Fields, soft and rigid bodies (Class room lecture, PPT, demonstration and assignments)	1	1	2
4.4	Basic of hair fur and (Class room lecture, PPT, demonstration and assignments)	-	1	2
4.5	Cloth simulation (Class room lecture, PPT, demonstration and assignments)	-	1	2

UNIT -5	**Lighting and Rendering**	**L**	**T**	**P**
5.1	The art and techniques of lighting (Class room lecture, PPT and demonstration in studio)	-	-	2
5.2	Three point lighting, Light links, camera shot (Class room lecture, demonstration, assignments and PPT)	1	1	2
5.3	Types of Rendering in Maya, Material and light Interaction (Class room lecture, demonstration, assignments and PPT)	1	1	2
5.4	Render Layers (Class room lecture, demonstration and assignments)	1	1	2
5.5	Render with Alpha Channel (Class room lecture, demonstration and assignments)	1	1	2

Practical / Projects/Assignments:
1. Create prop models
2. Light and Texture for Assets Design
3. Prepare Assets & Characters, low poly models
4. Create rain particle for exterior design
5. To prepare walk cycle

Suggested Readings:-
1. The Yucatan : A Guide to the Land of Maya Mysteries Plus Sacred Sites at Belize, Tikal & Copan - by Antoinette May
2. John Kundert - Giibs, Eric Mick Larkins, Eric Keller, Boaz Livny, Mark E.A. De Soura, Mastering Maya 7 , Wiley Kunzen Dort, DariushDerakhashani, Publishing Edition 2006
3. Maya - by Peter Schmidt (Editor), Enrique Nalda (Editor), Mercedes De LA Garza, Orefici
4. Maya 8 : The Complete Reference, Tom Meade, ShinsakuArima
5. Maya Character Modeling and Animation: Principles and Practices, Tereza Flaxman
6. Introducing Maya 8: 3D for Beginners, DariushDerakhshani

7. Understanding 3D Animation Using Maya, John Edgar Park
8. The Animators Survival Kit, Originally published: 2001 Author: Richard E. Williams
9. Stop Staring: Facial Modeling and Animation Done Right, Originally published: 2003 Author: Jason Osipa
10. The Art of Rigging, Volume 1,2,3 Publish ed : 2006;Author:Kiaran Ritchie
11. Advanced Maya Texturing and Lighting, Published: 2008; Author: Jeremy Birn

E- Resources:

1. Maya Modeling Tools; https://elementza.com/quickstart-to-3d-modeling-in-maya/
2. Create a project from start to finish-model, texture, rig, animate, and render in Maya at ;https://searchworks.stanford.edu/view/9629881

5 B.Sc. (GA) 4
5SEC-3: Graphics Design for Gaming

| Theory | 00 | Practical | 40 | Internal | 10 | Credits | 3 |

COURSES OBJECTIVES

1. Understand basics of Gaming and Game Design
2. Create Game assets, develop a particular style, look and feel
3. Use drawings, story boards for Game Design
4. Identify Photoshop tools for Game Design
5. Understanding the Pipelines for Game Design using Photoshop

COURSE OUTCOMES (CO)

1. Understand Gaming and Game Design Environment
2. Recognize and use Game Design elements in Photoshop
3. Demonstrate concepts of Props and Textures
4. Ability to apply filter and special effects for game elements
5. Understanding of Pipelines for Game Design using Photoshop

UNIT-1	Gaming and Game Design	L	T	P
1.1	Introduction to gaming and concepts. Classification of gaming (Discussion, Assignment, Practical)	-	1	-
1.2	Developments of Gaming Industry, Gaming as Modern Entertainment (Discussion, Assignment, Practical)	-	1	1
1.3	Introduction to Game Design, Design and Critical Thinking (Discussion, Assignment, Practical)	-	1	1
1.4	Scope for Visualization of Story (Discussion, Assignment, Practical)	-	1	1
1.5	Concept and development of visual narratives (Discussion, Assignment, Practical)	-	1	1

UNIT-2	Game Design	L	T	P
2.1	Game production process (Discussion, Assignment, Practical)	-	1	-
2.2	Designing the Game assets, Backgrounds and characters etc (Discussion, Assignment, Practical)	-	1	1
2.3	Development of a style and visual quality (Discussion, Assignment, Practical)	-	1	1
2.4	Drawing story boards (Discussion, Assignment, Practical)	-	1	1

| 2.5 | Understand the role of the designer / artist in game development (Discussion, Assignment, Practical) | - | 1 | 1 |

UNIT-3	Photoshop-1	L	T	P
3.1	Interface, Menu, Toolbar (Discussion, Assignment, Practical)	-	-	1
3.2	Document Windows: Image Resolution, Size of document, rotation of Image, copy image, Adjusting canvas size and duplicate of image (Discussion, Assignment, Practical)	-	1	1
3.3	Layer: Style and Effects, Transforming (Discussion, Assignment, Practical)	-	1	1
3.4	Layer Mask, Vector Mask Merge Layers, Flatten all layers Matting, Clipping and Knockouts (Discussion, Assignment, Practical)	-	1	1
3.5	Channel Mixer, Gradient Map Photo Filter Shadow/Highlight Invert, Equalize (Discussion, Assignment, Practical)	-	1	1

UNIT-4	Photoshop-2	L	T	P
4.1	Define Brush Preset , Define Pattern, Define Custom Shape (Discussion, Assignment, Practical)	-	1	-
4.2	Painting tools, Brush Setting, Selection, Filling and stroking (Discussion, Assignment, Practical)	-	1	1
4.3	Text: create, Text effects, character palette (Discussion, Assignment, Practical)	-	1	1
4.4	Filters, Liquefy, Effects (Discussion, Assignment, Practical)	-	1	1
4.5	Animation (Discussion, Assignment, Practical)	-	1	1

UNIT-5	Pipelines for Game Design using Photoshop	L	T	P
5.1	Start with an Idea Exercise 1: Concept Drawing (Discussion, Assignment, Practical)	-	1	-
5.2	Making Storyboards Exercise 2: Storyboard Exercise (Discussion, Assignment, Practical)	-	1	1

5.3	Creating Animatics Exercise 3: Animatics Exercise (Discussion, Assignment, Practical)	-	1	1
5.4	Creating a User Interface Exercise 4: Producing Wireframes (Discussion, Assignment, Practical)	-	1	1
5.5	Exercise 5: Finalizing the UI and Cover Art (Discussion, Assignment, Practical)	-	1	1

Practical / Projects/Assignments:
1. To prepare a Concept Drawing
2. To develop a Making Storyboard
3. To create Animation
4. Producing Wireframes for Game Design
5. To create UI and Cover Art

Suggested Readings:
1. The Art of Game Design: A book of lenses BY Jesse Schell / CRC Press, 04-Aug-2008
2. Game Feel: A Game Designer's Guide to Virtual Sensation (Morgan Kaufmann Game Design Books) by Steve Swink
3. On the Way to Fun: An Emotion-Based Approach to Successful Game Design by Roberto Dillon
4. Fundamentals of Game Design by Ernest Adams, ISBN-10 : 0321929675, ISBN-13 : 978-0321929679, Publisher: New Riders; 3rd edition
5. The Art of Game Design, 3rd Edition by Jesse Schell, Released July 2019, Publisher(s): A K Peters/CRC Press, ISBN: 9781351803632
6. Game Mechanics: Advanced Game Design Ernest Adams and Joris Dormans New Riders Games, ISBN-13: 978-0-321-82027-3, ISBN-10: 978-0-321-82027-4

E-Resource:
1. Game Mechanics, Advanced Game Design; https://www.pdfdrive.com/game-mechanics-advanced-game-design-d33516475.html
2. Game Design: Theory & Practice 2nd Edition; https://www.pdfdrive.com/game-design-theory-practice-2nd-edition-d8793769.html

6 B.Sc. (GA) 1
6CCC-13: Portfolio Management

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES

1. Understanding the basic concepts of portfolio management
2. Learn the basic framework of portfolio
3. Learn the portfolio revision & evaluation plans
4. To understand the portfolio risks
5. Understanding the professional digital portfolio

COURSE OUTCOMES (CO)

1. Know the various theoretical aspects of portfolio management
2. Describe the framework of portfolio Its Practice
3. Analysis the portfolio revision & evaluation
4. Assess risks for portfolio management
5. Interpret their own digital portfolio

UNIT-1	Portfolio Management	L	T	P
1.1	Meaning, Concept, Importance and Overview of Portfolio (Lecture, Discussion, Practical)	3	1	-
1.2	Significance of Portfolio Management (Lecture, Participation)	2	-	1
1.3	Phases of Portfolio Management: Security Analysis, Portfolio Analysis, Portfolio Selection, (Lecture, Discussion, Practical)	2	-	1
1.4	Rebalancing Portfolios (Lecture, Discussion)	2	1	1
1.5	Factors influencing Portfolio Management (Lecture, Quiz)	3	-	1

UNIT –2	Portfolio Management Framework	L	T	P
2. 1	Portfolio Creation Steps (Lecture, Assignment)	3	-	1
2.2	Selection of Portfolio (Lecture, Discussion, Practical)	2	-	1
2.3	Portfolio Planning steps (Lecture, Discussion)	2	1	1
2.4	Portfolio Management Steps (Lecture, Discussion, Practical)	2	1	1
2.5	Implementation & Monitoring of Portfolio (Lecture, Discussion)	2	-	1

UNIT-3	Portfolio Revision & Evaluation Plans	L	T	P
3.1	Portfolio revision – need –factors (Lecture, Discussion, Practical)	2	-	1
3.2	Affecting portfolio revision strategies (Lecture, Quiz, Assignment)	3	-	1
3.3	Merits and demerits of portfolio revision (Lecture, Assignment)	2	1	1
3.4	Performance evaluation (Lecture, Discussion, Practical)	3	-	1
3.5	Decision making and Problem Solving in Portfolio Revision (Lecture, Assignment)	2	1	-

UNIT-4	Portfolio Risks	L	T	P
4.1	Concept of risks in portfolio (Lecture, Discussion, Practical)	3	1	-
4.2	Concept of returns in portfolio (Lecture, Discussion)	2	1	1
4.3	Portfolio Market Risk and Unique Risk (Lecture, Discussion)	3	-	1
4.4	Types of Portfolio Management (Lecture, Discussion, Practical)	2	-	1
4.5	Concept of portfolio analysis and diversification of risk (Lecture, Discussion)	2	-	1

UNIT-5	Overview of Digital Portfolio	L	T	P
5.1	Why Use Digital Portfolios (Lecture, Discussion)	2	-	2
5.2	Characteristics of Digital Portfolio (Lecture, Assignment , In Class Exercise)	2	1	1
5.3	Selecting the Right Tools for Building a Digital Portfolio (Lecture, Discussion)	2	-	-
5.4	Market Strategies for Digital Portfolio (Lecture, Discussion, Practical)	2	1	1

5.5	Case studies of Poor & Good Portfolio (Lecture, Discussion)	2	-	2

Practical/ Projects/ Assignments:
1. Define the concept of project, portfolio, and program in the context of Project Management (between 900 and 1,000 words)
2. Explain the hierarchical relationship among the concept of project, portfolio, and program (at least 500 words).
3. Web Page development of your own professional portfolio
4. Professional resume with personal statement
5. One additional online presence (LinkedIn, e.g.)
6. Poster highlighting portfolio process
7. Portfolio presentation

Suggested Readings:
1. Jordon, Fisher," Security Analysis and Portfolio Management", 6 th Ed. Phi-New Delhi-110001.
2. Belgrad, S., Burke, K and Fogarty. R. 2008. The Portfolio Connection. 3rd ed. Thousand Oaks, CA: Corwin Press, A Sage Publications Company.
3. Ranganathan M. and Madhumathi R., Security Analysis and Portfolio Management, Pearson, 2012 (2/e).
4. Kevin S., Security Analysis and Portfolio Management, PHI Learning 2015 (2/e).
5. Chandra, P., Investment Analysis and Portfolio Management, Tata McGraw Hill, 2017
6. Bhalla V.K., Investment Management, S. Chand, (19/e)
7. Fischer D. E., Security Analysis and Portfolio Management, Pearson education, 1995.

E-Resources:
1. https://www.youtube.com/watch?v=-SHKkhxkAuw
2. https://www.youtube.com/watch?v=j8obKof2MDM
3. https://www.youtube.com/watch?v=O5zYJkTFlZs&t=34s
4. https://www.youtube.com/watch?v=TRJO1R16XQg

6 B.Sc. (GA) 2
6CCC-14: Project

Theory	00	Practical	80	Internal	20	Credits	6

COURSE OBJECTIVES

1. To prepare graphics designers and creative animators in their areas of expertise.

2. To develop a generic interactive graphics animation related framework, which will take advantage of recent advances in a number of related area such as: graphics design and development, character animation, digital libraries and other gaming model.

3. To understand ideation, script writing, storyboarding involved in product/ content development.

4. To have clear understanding about Production Pipeline.

5. To deploy these systems in various studies of the social and educational impact of the information society.

Guidelines for Project, Process and Submission

All the candidates of B.Sc. (GA) are required to do a project as part of their curriculum and submit a project report based on the work done by him/her during the project period.

THE GUIDE

The Guide for B.Sc. (GA) will be a faculty in New Media Technology with 3 years teaching experience.

PROJECT DURATION

➢ The B.Sc. (GA) Projects would be approximately 90 hours and carries a total of 6 credit (80 marks for Pr + 20 marks for IA)

➢ Project work should be based on topics in syllabus to identified situations.

➢ Number of students in a project group will not be more than three for B.Sc. (GA) .

➢ Synopsis of the project work should be submitted within the first 15 days of the duration.

➢ Project report should be submitted 10 days before the final exam for evaluation.

PROJECT DEVELOPMENT:

The project work shall be evaluated on two different parameters.

I. The Product
II. The Process

I. The Product

The final product developed during the project work should meet the following minimum criteria as mentioned below.

1. The product developed should have a meaningful Concept/Story implementing an idea with meaningful commentary and publish in e-format
2. Incorporating background music
3. Minimum 5 to 10 minute clips
4. Minimum 20 sec live action clip
5. Still graphics
6. A 2D/3D animation must be incorporated
7. A project report in the specified format

II. The Process

The process shall be evaluated in the following areas:

1. Application of Production pipeline (Preproduction, Production, Postproduction)
2. Clarity in Need Identification/objectives (Converting this into Idea)
3. Idea - how to implement/Evidence for each idea like text, image, sound and mockup minimum platform required to implement the same
4. Design and Development - looking to the idea, storyboard/communication strategy ,pedagogy, aesthetics/ Quality of Presentation of each piece of evidence Format ,Technical Quality, Readability, Software used/ Data management
5. Validation
6. Ability to defend the ideas through questioning and Viva

Sample Topics for project work

1. E_ Content for media
2. E_ Content for education
3. Multimedia content for learning
4. Website Development
5. Game Development
6. Advertisement using Animation

Project Evaluation Guidelines

A.) To be done by the Internal Examiner : (20 marks)

The evaluation of Project will be done on the basis of following heads:

Synopsis/Internal Assessment   -   20% of total marks

Product   -   30% of total marks

Process and its in-process documentation -   30% of total marks

Final Project report and presentation   -   20% of total marks

B.) To be done by External Examiner : (80 marks)

The evaluation of Project will be done on the basis of following heads:

Product   -   30% of total marks

Process   -   20% of total marks

Project report   -   20% of total marks

Comprehensive Viva   -   30% of total marks

SYNOPSIS

All students must submit a synopsis separately with the project report. Synopsis preferably should be of about 3-4 pages. The content should be as brief enough to explain the objective and implementation of the project that the candidate is going to take up. The write up must adhere to the guidelines and should include the following:

- Name / Title of the Project
- Objective and scope of the Project
- Process Description
- Hardware & Software to be used
- What contribution would the project make?
- Target Audience

TOPIC OF THE PROJECT- This should be explicitly mentioned at the beginning of the Synopsis. Since the topic itself gives a peep into the project to be taken up, candidate is advised to be prudent on naming the project. This being the overall impression on the future work, the topic should corroborate the work.

OBJECTIVE AND SCOPE: This should give a clear picture of the project. Objective should be clearly specified. What the project ends up to and in what way this is going to help the end user has to be mentioned.

PROCESS DESCRIPTION: The process of the whole multimedia/animation system proposed, to be developed, should be mentioned in brief.

RESOURCES AND LIMITATIONS: The requirement of the resources for designing and developing the proposed system must be given. The resources might be in form of the hardware/software or the data from the industry. The limitation of the proposed system in respect of a larger and comprehensive system must be given.

CONCLUSION: The write-up must end with the concluding remarks-briefly describing innovation in the approach for implementing the Project, main achievements and also any other important feature that makes the system stand out from the rest.

The following suggested guidelines must be followed in preparing the Final project Report:

Good quality white executive bond paper A4 size should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies.

<u>**Page Specification**</u> :(Written paper and source code)

- ➢ Left margin - 3.0 cms

- ➢ Right margin- 2.0 cms

- ➢ Top margin 2.54 cms

- ➢ Bottom margin 2.54 cms

- ➢ Page numbers - All text pages should be numbered at the bottom center of the pages.

Normal Body Text: Font Size: 12, Times New Roman, Double Spacing, Justified. 6 point above and below para spacing

Paragraph Heading Font Size: 14, Times New Roman, Underlined, Left Aligned. 12 point above & below spacing.

Chapter Heading Font Size: 20, Times New Roman, Centre Aligned, 30 point above and below spacing.

Coding Font size: 10, Courier New, Normal

Submission of Project Report to the University: The student will submit his/her project report in the prescribed format. The Project Report should include:

- One copy of the synopsis//abstract.
- Two hard Copy of the Project Report.

- Soft copy of the final product on CD in a thick envelope pasted inside of the back Cover of the project report.
- The Project Report may be of maximum 75 pages

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION OF THE PROJECT

1. Cover Page as per format

2. Acknowledgement

3. Certificate of the project guide/Centre Manager as at Annexure III

4. Certificate of the Company/Organization

5. Synopsis of the Project

6. Main Report

- Objective & Scope of the Project
- Details of Hardware & Software used
- Production pipeline
- Product Validation
- Cost and benefit Analysis
- Conclusion

Annexure:

1. Brief background of the organization where the student has developed the project

2. References

CERTIFICATE

This is to certify that this project entitled "xxxxxxxxxxxxxxxxxxxxxxxxxxx" submitted under partial fulfillment of the degree of BACHELOR OF SCIENCE (Multimedia / Graphics & Animation) to the Makhanlal Chaturvedi National University of Journalism and Communication, Bhopal, done by Mr./Ms._____, Roll No. _____ is a project work carried out by him/her at _____ under my guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

Signature of the Student   Signature of the Guide

Title of the Report

(Times New Roman, Italic, Font size = 24)

Submitted under partial fulfillment of the requirements

for the award of the degree of B.Sc. in Multimedia/Graphics & Animation

(Bookman Old Style, 16 point, centre)

University Logo

Guide   Submitted by:

(Guide Name)   (Student's name)

Roll No.:

Makhanlal Chaturvedi National University
of Journalism and Communication, Bhopal

SELF CERTIFICATE

This is to certify that the project report entitled"_____" is done by me is an authentic work carried out for the partial fulfillment of the requirements for the award of the degree of B.Sc. in Multimedia / Graphics & Animation under the guidance of_____. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

Signature of the student
Name of the Student

Roll No.

ACKNOWLEDGEMENTS

In the "Acknowledgement" page, the writer recognises his indebtedness for guidance and assistance of the project advisor and other members of the faculty. Courtesy demands that he also recognize specific contributions by other persons or institutions such as libraries and research foundations. Acknowledgements should be expressed simply, tastefully, and tactfully.

References

1. D.L. Carney, J.I. Cochrane, "The 5ESS Switching System: Architectural Overview," AT&T Technical Journal, vol. 64, no. 6 , July-August 1985, pp. 1339-1356.

2. A. Stevens, C++ Database Development, MIS Press, New York, 1992, p. 34.

3. J. Martin, Computer Data-base Organization, Prentice-Hall, Englewood Cliffs, NJ, 1977, p. 53.

4. www.Ibm.com/in

5. www.intel.com/india9

Binding & Color code of the Report

B.Sc. (MM) and B.Sc. (GA)

Hard Bound Report

Background of the cover page –Blue

Letters in Black

6 B.Sc. (GA) 3A
6CCE-7: Animation for New Media

Theory	50	Practical	30	Internal	20	Credits	6

COURSE OBJECTIVES:
1. Learn the principles and tools of Animation
2. Learn the development of New Media Animation techniques
3. Understand the fundamentals of Animation
4. Explore the current trends for New Media in the digital media industry
5. Applying the tools for creation of visual art

COURSE OUTCOMES:
1. Understanding the essential principles of visual art
2. Identifying concepts and apply production methods to create digital graphics
3. Demonstrate Content for various new media platform
4. Gain in-depth knowledge on Animation for New Media
5. Problem-solving skills utilizing industry standard applications

UNIT-1	Fundamentals of New Media and Animation	L	T	P
1.1	New Media- Introduction and Types (Lecture, Discussion, Practice)	2	-	1
1.2	New Media- History and Characteristics (Lecture, Discussion, Practice)	1	2	1
1.3	Animation- Introduction, History and Principles (Lecture, Discussion, Practice)	2	1	1
1.4	Animation Concepts and Techniques (Lecture, Discussion, Practice)	2	1	1
1.5	Types of Animation (Lecture, Discussion, Practice)	2	-	1

UNIT-2	Animation for New Media I	L	T	P
2.1	Animation for Social Media Marketing (Lecture, Discussion, Practice)	2	-	1
2.2	Animated Video Strategy for Your Social Media (Lecture, Discussion, Practice)	1	2	1
2.3	Social Media Engagement for Brand with Animated Videos (Lecture, Discussion, Practice)	2	1	1
2.4	Animated Visuals Importance for New Media (Lecture, Discussion, Practice)	2	1	1
2.5	Animation video as a tool of storytelling (Lecture, Discussion, Practice)	2	-	1

UNIT-3	Animation for New Media II	L	T	P

3.1	Motion Graphics for Social Media (Lecture, Discussion, Practice)	2	-	1
3.2	Animation for recreation of news (Lecture, Discussion, Practice)	1	2	1
3.3	Animation for Advertising (Lecture, Discussion, Practice)	2	1	1
3.4	Animation for Media (Lecture, Discussion, Practice)	2	1	1
3.5	Animation for Entertainment (Lecture, Discussion, Practice)	2	-	1

UNIT-4	Computer Art & Animation - 1	L	T	P
4.1	Motion Creation tools- online (Lecture, Discussion, Practice)	2	-	1
4.2	Motion Creation tools - offline 1 (Lecture, Discussion, Practice)	1	2	1
4.3	Motion Creation tools - offline 2 (Lecture, Discussion, Practice)	2	1	1
4.4	Presentation Creation Tools (Lecture, Discussion, Practice)	2	1	1
4.5	Graphic Creation Tools 1 (Lecture, Discussion, Practice)	2	-	1

UNIT-5	Computer Art & Animation - 2	L	T	P
5.1	Graphic Creation Tools 2 (Lecture, Discussion, Practice)	2	-	1
5.2	Social Media and Sharing Platforms (Lecture, Discussion, Practice)	1	2	1
5.3	Virtual Reality Environments (Lecture, Discussion, Practice)	2	1	1
5.4	Streaming Audio and Video (Lecture, Discussion, Practice)	2	1	1
5.5	Production Tools and Techniques (Lecture, Discussion, Practice)	2	-	1

Practical/Projects/Assignments:
1. Create Info graphics
2. Create Short video ad for digital platform
3. Content creation for various new media platform
4. Create motion graphics for ad
5. Create animated typography

Suggested Readings:

1. Sensations of History: Animation and New Media Art by James J. Hodge, 2019 eISBN: 978-1-4529-6057-9
2. The Animator's Survival Kit: By Richard Williams 2015 eISBN: 9780571261710
3. Design for Motion: Fundamentals and Techniques of Motion Design By Austin Shaw ISBN-13: 978-1138318649
4. Elements of Multimedia By Sreeparna Banerjee 2019, eBook ISBN 9780429433207
5. Handbook of New Media   ISBN: 9781412918732

E-Resources:
1. https://link.springer.com/chapter/10.1007/978-3-642-14533-9_57
2. http://www.philol.msu.ru/~discours/images/stories/speckurs/New_media.pdf
3. https://www.jstor.org/stable/10.5749/j.ctvpb3wh2

6 B.Sc. (GA) 3B
6CCE-8: UI/UX Design

| Theory | 50 | Practical | 30 | Internal | 20 | Credits | 6 |

COURSE OBJECTIVES

6. To understand the basics of user interface
7. To understand the basics of user experience
8. To learn basic features of AdobeXD
9. To learn advance features of AdobeXD
10. To understand the different types of design techniques

COURSE OUTCOMES (CO)

6. Student would aware of interface design of product, UI widget and input devices
7. Student would aware of UX research methods and its elements
8. Student can create graphics using AdobeXD
9. Student can create project using AdobeXD
10. Student can use different design techniques in their project

UNIT-1	Introduction to User Interface (UI)	L	T	P
1.1	Introduction to Interface Design in the areas of Product, Space and Communication Design (Lecture, Discussion)	3	-	-
1.2	Different types of Interfaces, Making the different Tangible and Intangible Interfaces user friendly (Lecture, Discussion)	2	2	-
1.3	Color, Form, Texture and Interface Design etc (Lecture, Discussion)	3	1	-
1.4	Study of Typography, Expressive Typography, Compositions with type, Calligraphic Experiments (Lecture, Discussion)	3	1	-
1.5	UI Widgets & Input Devices (Lecture, Discussion)	3	-	-

UNIT-2	Introduction to User Experience (UX)	L	T	P
2.1	Introduction to UX, History, Present and Future of UX (Lecture, Discussion)	3	-	-
2.2	Introduction to UX Research Methods	2	2	-

	(Lecture, Discussion)			
2.3	Introduction to Information Architecture and its importance (Lecture, Discussion)	**3**	**1**	**-**
2.4	Introduction to Lean UX (Lecture, Discussion)	**3**	**1**	**-**
2.5	The Elements of User Experience (Lecture, Discussion)	**3**	**-**	**-**

UNIT-3	**Adobe XD-I**	**L**	**T**	**P**
3.1	Introduction to Adobe Experience Design (XD), Understanding common file formats, Working with the Design and Prototype views, Navigating around the User Interface (Lecture, Discussion, Practice)	**2**	**-**	**1**
3.2	Setting up a Project-Creating Art boards, Arranging, editing and deleting Art boards (Lecture, Discussion, Practice)	**1**	**2**	**1**
3.3	Creating additional screens for different display sizes and platforms, Adding layout and square grids (Lecture, Discussion, Practice)	**2**	**1**	**1**
3.4	Creating Graphics in Adobe Experience Design-Creating and combining simple shapes, Setting appearance attributes, Controlling corner radius values, Solid fill colors, Gradient fills, Strokes, Adding drop-shadows & background Blurs (Lecture, Discussion, Practice)	**2**	**1**	**1**
3.5	Drawing with the Pen Tool, Editing points and paths, Creating and editing symbols, Linked symbols, Create and Format Text using Type kit fonts, Saving Character Styles (Lecture, Discussion, Practice)	**2**	**-**	**1**

UNIT-4	**Adobe XD -II**	**L**	**T**	**P**
4.1	Adding Assets from other Sources- Importing Images, Importing SVG files, Masking Techniques, Open a layered Adobe Photoshop file, Using Illustrator vector graphics (Lecture, Discussion, Practice)	**2**	**1**	**-**
4.2	Prototyping- Wireframes to Interactive Prototypes, Link and Unlink Screens, Setting Screen Triggers, Adding Interactions to Elements, Adjusting easing and duration properties (Lecture, Discussion, Practice)	**2**	**-**	**1**

4.3	Auto- Animate, Timed Animation Transitions, Prototype drag gestures, Overlays for side menus and Keyboards, Preserve Scrolling, Fixed Elements, Voice Triggers and Speech Commands (Lecture, Discussion, Practice)	1	2	1
4.4	Testing your Project- Previewing designs in the preview window or on mobile device, Recording the user experience as a .mov file (Lecture, Discussion, Practice)	2	1	1
4.5	Sharing your Project- Share a public or private prototype, Allow comments and hotspots, Publish design Specs, Extract and download Asserts for developers (Lecture, Discussion, Practice)	2	1	1

UNIT-5	Design Techniques and UI/UX Evaluation	L	T	P
5.1	Scenarios, Personas, Storyboards, Wire Framing, Information Architecture, Brain Storming, Card Sort (Lecture, Discussion)	3	-	-
5.2	Prototyping Tools, Both Low-Fidelity and High-Fidelity, Wizard of Oz Prototypes, Proof Concept Video and Metaphor Development (Lecture, Discussion)	2	2	-
5.3	Introduction to Various Methods of Evaluation- Formative Evaluation and Summative Evaluation, Implicit Methods and Explicit Methods (Lecture, Discussion)	3	1	-
5.4	Evaluation Design Use and Design Usable, Design Learnability and Design Memorability (Lecture, Discussion)	3	1	-
5.5	Evaluating user satisfaction- Cognitive Measure, Mental Effort Emotional Measures- Feelings Experienced (Lecture, Discussion)	3	-	-

Practical / Projects/Assignments:

1. Discuss about different types of user interface for different devices in group
2. Assignment on elements of User Experience
3. Create different types of Graphics using AdobeXD
4. Designing UI for Mobile Screen in AdobeXD
5. Designing UI for Web Screen in AdobeXD

Suggested Readings:

1. The Design of Everyday Things, Basic Book by Norman, Donald A, 2002, ISBN: 9780465067107

2. Designing the User Interface: Strategies for Effective Human Computer Interaction by Shneiderman, Ben, and Catherine Plaisant, 4th edition Addison Wesley, 2004, ISBN: 9780321197863
3. Human-Computer Interaction by Dix, Alan J, Janet E Finlay, 2nd edition, 1998, Prentice Hall, ISBN: 9780132398640
4. User Interfaces (Interactive Technologies) by Olsen, Dan R Developing Morgan Kaufmann, 1998 ISBN: 9781558604186
5. Adobe XD Classroom in a Book by Brian Wood, 2020, Macromedia Press ISBN: 0136583806

E-Resources:

1. User Interface accessed at https://www.tutorialspoint.com/software_architecture_design/user_interface.htm
2. User Interface Design accessed at https://www.javatpoint.com/software-engineering-user-interface-design
3. Learn basic UI Design accessed at https://www.freecodecamp.org/news/learn-ui-design-in-5-minutes-tutorial/
4. Software User Interface Design accessed at https://www.tutorialspoint.com/software_engineering/software_user_interface_design.htm
5. What Is UX Design accessed at https://careerfoundry.com/en/tutorials/ux-design-for-beginners/what-is-ux-design/
6. Adobe XD tutorials accessed at https://helpx.adobe.com/in/xd/tutorials.html
7. The Ultimate Guide to Adobe XD Tutorials accessed at https://www.mockplus.com/blog/post/adobe-xd-tutorial
8. Adobe XD Tutorials For Learning UI/UX Designers accessed at https://www.vandelaydesign.com/free-adobe-xd-tutorials/
9. Adobe XD Tutorials (Beginner to Advanced) accessed at https://designshack.net/articles/software/adobe-xd-tutorials/

6 B.Sc. (GA) 4
6SEC-4: Design and Business Management

| Theory | 40 | Practical | 00 | Internal | 10 | Credits | 3 |

COURSE OBJECTIVES
1. Understand the Business related works and knowledge to execute them
2. Understand the Market and Consumer Behaviour
3. Understand the Organization and its structure and the way of functioning
4. Understand the Managerial works and administrative jobs
5. Understand Design and Project Planning

COURSE OUTCOMES (CO)
1. Student will be able to identify and build the team relevant to work / projects
2. Student will have the ability to plan a project, draft estimations
3. Student will be able to correlate Consumer demand and Market situations
4. Student will be able to address Conflicts management
5. Student will know to handle public relations

UNIT-1	Introduction to Marketing	L	T	P
1.1	Market and Characteristics of a Market (Lecture, Discussion)	1	1	-
1.2	Elements of a Market, Factors Affecting a Market (Lecture, Discussion)	1	1	-
1.3	Marketing- Traditional marketing v/s Online marketing (Lecture, Discussion)	1	1	-
1.4	Components of Online Marketing (Lecture, Discussion)	1	1	-
1.5	Content Marketing, Goals of Content Marketing (Lecture, Discussion)	1	-	-

UNIT-2	Consumer Behavior	L	T	P
2.1	Consumer Behavior- Consumerism, Features of Consumerism, Social and Ethical Perspective of Consumer behavior (Lecture, Discussion)	1	1	-
2.2	Dimensions of Consumer Behavior (Lecture, Discussion)	1	1	-
2.3	Demand Analysis- Demand Curve, Determinants of Demand (Lecture, Discussion)	1	1	-

2.4	Demand Function (Lecture, Discussion)	1	1	-
2.5	Marketing Concepts- Production Concept, Product Concept, Selling Concept (Lecture, Discussion)	1	-	-

UNIT-3	**Organizational Behavior**	L	T	P
3.1	Organizational Behavior – Determinants (Lecture, Discussion)	1	1	-
3.2	Nature of People, Nature of Organization (Lecture, Discussion)	1	1	-
3.3	Models, Team (Lecture, Discussion)	1	1	-
3.4	Learning, Personality (Lecture, Discussion)	1	1	-
3.5	Organizational Behavior – Leadership, Theories of Leadership (Lecture, Discussion)	1	-	-

UNIT-4	**Conflict Management**	L	T	P
4.1	Conflict Management- Classification of Conflict (Lecture, Discussion)	1	1	-
4.2	Skills Required for Conflict Resolution (Lecture, Discussion)	1	1	-
4.3	Steps in Conflict Management (Lecture, Discussion)	1	1	-
4.4	Aggravate Conflicts (Lecture, Discussion)	1	1	-
4.5	Different Methods of Handling Conflicts (Lecture, Discussion)	1	-	-

UNIT-5	**Design & Project Planning**	L	T	P
5.1	Interactive role of Design including administration. Design documentation and management of processes such as ISO	1	1	-

	9000,ISO 14000, Quality Function Deployment etc (Lecture, Discussion)				
5.2	Creativity, innovation and its management in a team work (Lecture, Discussion)	**1**	**1**	**-**	
5.3	Team building, interpersonal relationship and conflict resolution (Lecture, Discussion)	**1**	**1**	**-**	
5.4	Professional practice, contracts, fees, negotiations, ethics and public relations (Lecture, Discussion)	**1**	**1**	**-**	
5.5	Project planning - Design as a strategic tool in the corporate sector (Lecture, Discussion)	**1**	**-**	**-**	

Practical/Projects/Assignments:
1. Study Impact of Social Media on Consumer Behaviour
2. Study Emerging Role of Teams in Multicultural Organizations
3. Study Effect of Social Media Sites in Consumer Behaviour Marketing.
4. Study Customer Preferences on Coupon Code Based Promotional Activities.
5. Case studies in event, brand, and advertisement management. Discuss Product management

Suggested Readings:

1. Design Management – A handbook of Issues and Methods, M. Okley (ed.), Blackwell Pbl. 1990
2. Project Management,S.A Chunawalla, Himalaya Pbl. House, Mumbai

E-Resource :

1. https://www.iedunote.com/organizational-behavior
2. https://blog.capterra.com/what-is-organizational-behavior/
3. https://pressbooks.bccampus.ca/obcourseweir/chapter/1-1-understanding-organizational-behavior/
4.https://www.tutorialspoint.com/organizational_behavior/organizational_behavior_tutorial.pdf
5. https://www.consumerpsychologist.com/cb_Introduction.html
6. https://study.com/academy/lesson/what-is-consumer-behavior-in-marketing-factors-model-definition.html

1 B.Sc. (GA) 5
OE-1: Word Processing and Presentation for Multimedia

| Theory | 00 | Practical | 40 | Internal | 10 | Credits | 3 |

COURSE OBJECTIVES
1. To learn about Word Processing
2. To learn about different features of Word Processing Software
3. To learn about different features of Excel
4. To learn about Presentation Software
5. To learn about different features of Presentation Software

COURSE OUTCOMES (CO)
1. Students would have knowledge of different Word Processing Software available
2. Student can create and validate document using MS Word
3. Student can prepare worksheet in excel using different features like function and chart
4. Students would have knowledge of different Presentation Software available
5. Student can create impressive presentation using different multimedia elements

UNIT-1	Basics of Word Processing	L	T	P
1.1	Introduction of Word Processing (Discussion)	-	1	-
1.2	History of Word Processing (Discussion)	-	1	-
1.3	Standard Features of Word Processors (Discussion)	-	2	-
1.4	Word Processors vs. Text Editors vs. Desktop Publishing Systems (Discussion, Demonstration, Practice)	-	1	1
1.5	Introduction to various Word Processing Software (Discussion, Demonstration, Practice)	-	1	2

UNIT-2	Features of Word Processing	L	T	P
2.1	Editing Feature: Insert, Delete, Cut, Copy, Paste, Bold, Italic, Underline Spelling Feature: Spell Check, Grammar, Thesaurus (Discussion, Demonstration, Practice)	-	1	1
2.2	Formatting Feature: Header & Footer, Footnote, Endnote Searching Feature: Find, Find & Replace (Discussion, Demonstration, Practice)	-	1	1

2.3	Layout Feature: Paragraph, Paragraph Indent, Margins. Insert Features: Image, Clipart, Shape, Symbol, Chart (Discussion, Demonstration, Practice)	-	1	1
2.4	Other Features: Mail Merge, Table, Macro (Discussion, Demonstration, Practice)	-	1	1
2.5	File Management: Create, Copy, Move, Delete Printing Feature: Printing File, Print Preview (Discussion, Demonstration, Practice)	-	-	1

UNIT-3	Features of Excel	L	T	P
3.1	Introduction to Microsoft Excel, Understand Row, Column, Cell Address, Worksheet (Discussion, Demonstration, Practice)	-	1	1
3.2	Perform Basic operations like Add, Subtract, Multiply, Divide in Excel Introduction to formulas and functions in Excel (Discussion, Demonstration, Practice)	-	1	1
3.3	Create different types of charts in Excel (Discussion, Demonstration, Practice)	-	1	1
3.4	Advance features of Chart like Add Chart Element, Change Colors, Chart Styles, Format Chart Title, Format Chart Area, Format Plot Area (Discussion, Demonstration, Practice)	-	1	1
3.5	Creating New Worksheet, Copy Worksheet, Hiding Worksheet, Delete Worksheet, Save and Close Workbook (Discussion, Demonstration, Practice)	-	-	1

UNIT-4	Basics of Presentation Software	L	T	P
4.1	Importance and Need of Presentation (Discussion)	-	1	1
4.2	Use of presentation Software (Discussion)	-	1	1
4.3	Advantages of Presentation Software (Discussion)	-	1	1
4.4	Basic parts of presentation: Introduction, Body, Conclusion (Discussion, Demonstration, Practice)	-	1	1

4.5	Various Presentation Software (Discussion, Demonstration, Practice)	-	-	1

UNIT-5	Features of Presentation Software	L	T	P
5.1	Understand the Basic Task: Adding, Deleting, Moving, Modifying Slides (Discussion, Demonstration, Practice)	-	1	1
5.2	Templates: Applying Templates, Creating Templates (Discussion, Demonstration, Practice)	-	1	1
5.3	Graphics: Insert Images, Adding Clipart, Transition, Animation (Discussion, Demonstration, Practice)	-	1	1
5.4	Miscellaneous Tasks: Spell Check, Slideshow, Save As A Web Page, Printing (Discussion, Demonstration, Practice)	-	1	1
5.5	Multimedia Object: Video, Audio, Hyperlink (Discussion, Demonstration, Practice)	-	-	1

Practical / Projects/Assignments:
1. Design E-book cover pages / Magazine front/ books front/back page using MS Word
2. Use smart art and create organization charts and Insert Image into the shape
3. Create different types of chart with your choice of colours and title
4. Prepare a PowerPoint presentation using multimedia
5. Create an Auto Run presentation with Animation Effect and Transition Effects

Suggested Readings:
1. Joyce Cox and Joan Preppernau, 2009, Microsoft Office Word 2007 Step by Step, PHI
2. Vishnu PriyaSinh, 2014, Microsoft Office 2007, Asian
3. John Pierce, 2007, 2007 Microsoft Office System Inside Out, PHI
4. Kogent Solutions Inc., 2009, PowerPoint 2007 in Simple Steps, deramtech press
5. Kogent Solutions Inc., 2012, Office 2007 in Simple Steps, deramtech press

E-Resources:
1. MS Word Tutorial accessed at
   https://www.tutorialspoint.com/word/word_getting_started.htm#:~:text=Assuming%20you%20have%20Microsoft%20Office%202010%20installed%20in,Microsoft%20Word%202010from%20the%20submenu%20and%20click%20it.
2. MS Excel Tutorial accessed at https://www.tutorialspoint.com/excel/index.htm
3. MS PowerPoint Tutorial accessed at https://www.tutorialspoint.com/powerpoint/index.htm

2 B.Sc. (GA) 5
OE-2: Digital Content Production

Theory	00	Practical	40	Internal	10	Credits	3

COURSE OBJECTIVES
1. Learn the principles and tools of Production
2. Learn the development of modern techniques and practices
3. Understand the fundamentals of Content Production
4. Explore the various tools using for Digital Content Production
5. Introduce the learners to various stages of Content Production for digital media platforms

COURSE OUTCOMES (CO)
1. Understanding the essential principles of Content Production
2. Recognize types and process of different Digital Content Production
3. Identify Aesthetic and technical aspects of tools for Content Production
4. Demonstrate Content using tools and techniques of Production
5. Clarity in digital media platforms workflow pipeline

UNIT-1	Introduction	L	T	P
1.1	What is Digital content (Discussion)	-	1	-
1.2	Introduction to multiple digital platforms (Discussion)	-	2	-
1.3	Convergent digital media: Emerging trends (Discussion)	-	1	-
1.4	Outcomes of digital content production. (Discussion, Practice)	-	2	1
1.5	Examples of digital content production (Discussion, Practice)	-	1	1

UNIT-2	Digital Content Creation	L	T	P
2.1	Determine the purpose of digital content creation (Discussion)	-	1	-
2.2	Create useful, quality content. (Discussion)	-	2	-
2.3	Promote content on social media. (Discussion, Practice)	-	1	2
2.4	Utilize photos and multimedia. (Discussion)	-	1	-
2.5	Track and analyze content, Implement an SEO program (Discussion, Practice)	-	1	1

UNIT-3	Tools and Techniques-1	L	T	P
3.1	Image Creation tools- online	-	1	1

		L	T	P
	(Discussion, Practice)			
3.2	Image Creation tools - offline (Discussion, Practice)	-	1	1
3.3	Video Creation tools- online (Discussion, Practice)	-	1	1
3.4	Video Creation tools- offline 1 (Practice)	-	-	1
3.5	Video Creation tools- offline 2 (Discussion, Practice)	-	1	1

UNIT-4	**Tools and Techniques**-2	L	T	P
4.1	Animation Tools (Discussion, Practice)	-	1	1
4.2	Info graphic Creation Tools (Practice)	-	-	1
4.3	Video Creation tools- online (Discussion, Practice)	-	1	1
4.4	Presentation Creation Tools (Discussion, Practice)	-	1	1
4.5	Screen Capture, Meme Creation, GIF Creation Tools (Discussion, Practice)	-	1	1

UNIT-5	**Digital Content Strategy**	L	T	P
5.1	Understand the Key Fundamentals and Foundations of Digital Content Strategy (Discussion, Practice)	-	1	1
5.2	Understand Your Audience (Discussion)	-	1	-
5.3	SEO, keyword (Discussion, Practice)	-	1	1
5.4	Optimize Your Content with Keywords (Discussion, Practice)	-	1	1
5.5	AI & Machine Learning Tools for Digital Content (Discussion, Practice)	-	1	1

Practical/Projects/Assignments:
1. Case study of Digital Content Strategies
2. Create Info graphics for any recent event
3. Short video ad for digital platform (Instagram)
4. Content creation for social media(Facebook, WhatsApp)
5. Motion Graphics for any Events

Suggested Readings:
1. https://link.springer.com/book/10.1007/978-1-4471-0293-9#about
2. https://www.clearvoice.com/blog/top-content-creation-tools/

3. https://www.ventureharbour.com/online-marketing-ai-machine-learning-tools-you-can-try-today/
4. https://www.singlegrain.com/artificial-intelligence/how-machine-learning-is-transforming-content-marketing/

E Resources:
1. https://onlinecourses.swayam2.ac.in/ntr20_ed11
2. https://biteable.com/templates/
3. https://www.elegantthemes.com/blog/design/best-free-graphic-design-software-for-2019
4. https://www.singlegrain.com/artificial-intelligence/12-ways-to-use-machine-learning-in-digital-marketing/

3 B.Sc. (GA) 5
OE-3: Character Animation

Theory	00	Practical	40	Internal	10	Credits	3

COURSE OBJECTIVES
1. To provide understanding on the concept and usage of Blender
2. Create and manipulate 3D assets in the application Interface
3. Critique visual structures through the use of basic design principles
4. Utilize appropriate content and techniques to conceptualize idea
5. Employ lighting techniques in 3D modeling

COURSE OUTCOMES (CO)
1. Recognize types and process of different virtual environment in blender
2. Identify Aesthetic and technical aspects of 3D asset modeling
3. Perform Feature and Function of Blender
4. Generate e-portfolio to display 3D software talent
5. Demonstrate the use of visual simulation

UNIT-1	Character Animation using Blender	L	T	P
1.1	Character Animation (Discussion)	-	1	-
1.2	The Blender Interface (Discussion, Practice)	-	1	1
1.3	Introduction to Box Modeling (Discussion, Practice)	-	1	1
1.4	Intermediate Modeling Techniques (Discussion, Practice)	-	1	1
1.5	Introduction to the Poly by Poly technique (Discussion, Practice)	-	1	1

UNIT-2	Introduction to Materials	L	T	P
2.1	Introduction to Shaders (Discussion, Practice)	-	1	1
2.2	Introduction to Textures (Discussion, Practice)	-	1	1
2.3	Introduction to Normal Maps (Discussion, Practice)	-	1	1
2.4	Introduction to UV-Unwrapping (Discussion, Practice)	-	1	1
2.5	UV unwrapping an image and adding a texture (Practice)	-	-	1

UNIT-3	Introduction to Armatures	L	T	P
3.1	Adding Armatures, (Practice)	-	-	1

3.2	Attaching a mesh to an Armature (Discussion, Practice)	-	1	1
3.3	Weight Painting (Discussion, Practice)	-	1	1
3.4	Shape Keys (Discussion, Practice)	-	1	1
3.5	Video Sequence Editor (Discussion, Practice)	-	1	1

UNIT-4	Particles	L	T	P
4.1	Cloth Simulation (Practice)	-	-	1
4.2	Particles /Water Simulation (Discussion, Practice)	-	1	1
4.3	Creating hair (Discussion, Practice)	-	1	1
4.4	Special Effects (Discussion, Practice)	-	1	1
4.5	Soft Bodies (Discussion, Practice)	-	1	1

UNIT-5	Animating	L	T	P
5.1	Introduction to animating (Discussion, Practice)	-	1	1
5.2	Creating a Bouncing Ball (Discussion, Practice)	-	1	1
5.3	Ipo Curve Editor (Discussion, Practice)	-	1	1
5.4	NLA Editor (Discussion, Practice)	-	1	1
5.5	Rendering (Practice)	-	-	1

Practical/Projects/Assignments:
1. Create a Opening Title of a Short Film
2. Create a promo using blender physics
3. Create a logo animation in blender
4. Create a e-portfolio
5. Make an Animated Flag

Suggested Readings:
1. Blender Activity Book for Beginners: Activity Book for those New to 3D Modeling using Blender by Adriel Samaniego
2. The Complete Guide to Blender Graphics: Computer Modeling & Animation, Fifth Edition by John M. Blain
3. Blender FD 3e (For Dummies) by Jason van Gumster

4. The Complete Guide to Blender Graphics: A Beginner's Guide by John M. Blain 5. Learning Blender: A Hands-On Guide to Creating 3D Animated Characters 1st Edition by Oliver Villar

E-Resources:

1. https://www.blendernation.com/category/education/tutorials/videotutorials/
2. https://www.blenderguru.com/tutorials
3. https://www.blendernation.com/category/education/documentation/books/
4. https://cgcookie.com/categories/3d/tutorials

4 B.Sc. (GA) 5
OE-4: Advertising for New Media

Theory	00	Practical	40	Internal	10	Credits	3

COURSE OBJECTIVES
1. To Introduce Concepts and Principle of Advertising
2. To study the Growth, Impact and Implication of the Advertising
3. To give hands-on-training to students in the Application of Digital Advertising
4. To understand Social Media Advertising
5. To understand Online Corporate Community

COURSE OUTMES (CO)
1. Student would understand, develop an Advertising Plan and Present and Defend it Persuasively
2. Student would be able to evaluate the effectiveness of Advertising and Marketing Communications Initiatives
3. Student would understand role and importance of Digital Advertising in a Rapidly Changing Business landscape
4. Student would understand how effectiveness of a Digital Marketing Campaign can be Created and Measured
5. Student would be able to critically understand the Effects of Promotional Communications in broader Social, Cultural and Political Contexts

UNIT 1	Introduction to Advertising	L	T	P
1.1	Concept, Nature, Definition, Evolution and History Need, Role and Importance of Advertising (Demonstration, Practice)	-	1	1
1.2	Types and Classification of Advertising, Factors Determining Advertising Opportunity of a Product, Service, Idea (Demonstration, Practice)	-	1	1
1.3	Basis Theories and Applications of Advertising Media (Demonstration, Practice)	-	1	1
1.4	Appeals of Advertising Messages (Demonstration, Practice)	-	-	1
1.5	Layouts of advertisements, Elements, Advertising Campaigns. (Demonstration, Practice)	-	1	1

UNIT 2	Digital Advertising	L	T	P
2.1	Defining Digital Advertising Evolution and Current Status (Demonstration, Practice)	-	1	-
2.2	Digital Media Landscape, Digital Advertising Agencies, Structure and Functions (Demonstration, Practice)	-	1	1
2.3	Digital Media Integration Across Advertising, Market Research, Activiion, Advent of Hybrid Advertising (Demonstration, Practice)	-	1	1

2.4	Advantages of Online Advertising, Corporate Website, Corporate Blog (Demonstration, Practice)	-	1	1
2.5	Case Studies: Successful and Disasters Brand Presence on Social Media (Demonstration, Practice)	-	1	1

UNIT 3	Web Advertising	L	T	P
3.1	Web Advertising : Banner, Scrollbar, Fly Over, Customized, Website Traffic Tracking (Demonstration, Practice)	-	1	1
3.2	E-mail Advertising- Email Newsletters, Transactional Emails, Direct Emails (Demonstration, Practice)	-	1	1
3.3	Collecting e-mail Addresses, Design e-mail Ad Campaign, Design Look and Feel of Promotional e-mails, Track and Evaluate e-mail ad Campaingn, Search Engine Advertising (SEA) (Demonstration, Practice)	-	1	1
3.4	Posting Models -CPC, CPA, CPM, Cost per Call, Traffic Cost (Demonstration, Practice)	-	1	1
3.5	Elements of Mobile Advertising, Advantages, Mobile ad Types , Rich Media, Planning a Mobile ad Campaign (Demonstration, Practice)	-	1	-

UNIT 4	Social Media Advertising	L	T	P
4.1	Creating a Facebook page, Creating Strategy of Facebook Ads, Setting S.M.A.R.T. Goals, (Demonstration, Practice)	-	1	1
4.2	Choosing Target Audience and ad Spend, Choosing Ad Look, Creating Facebook ads report (Demonstration, Practice)	-	1	1
4.3	Introduction to Twitter Advertising, Promoted Tweets vs. Promoted Accounts (Demonstration, Practice)	-	1	-
4.4	Selecting Primary Targeting Criteria, Creating Tweets (Demonstration, Practice)	-	1	1
4.5	Introduction to Youtube Advertising, Video Marketing, Designing a YouTube Campaign, Setting Youtube Account and Uploading (Demonstration, Practice)	-	1	1

UNIT 5	Digital PR in Marketing, Brand Promotions and Corporate Reputation Management	L	T	P

5.1	Online Sponsorships and Brand Promotion (Demonstration, Practice)	-	1	1
5.2	Digital Media in Brand Building and Marketing Mix (Demonstration, Practice)	-	1	1
5.3	New for Synergy between, Digital marketing and PR to Achieve Marketing Goals (Demonstration, Practice)	-	1	1
5.4	Corporate website and Blogs Monetization of Content (Demonstration, Practice)	-	-	1
5.5	Building Online Corporate Community, Reputation in the New Age (Demonstration, Practice)	-	1	1

Practical/Projects/Assignments:
1. To prepare Digital Advertising
2. Prepare an e-mail Advertising Campaign
3. Prepare a Social Media Advertising Campaign for admissions in an academic institution.
4. Prepare a corporate Advertising Strategy for Corporate Office

Suggested Readings:
1. Know online Advertising: A: Information about online Advertising at One Place; AvinashTiwary; partridge India; ISBN -10: 1482872498,ISBN-13:978-142872491,(30 July 2016)
2. Learning Google Ad Words and Google Analytics; Benjamin Mangold; Loves data; ISBN-10:0994390408, ISBN-18-978-0994390400;8 Spetember 2015
3. Online Advertising; EhsanZarei; Lulu.co.; ISBN-10:1291728368, ISBN-13978-129728361,20 February 2014
4. Internet Advertising: Learn New Things About Internet Advertising; John Wright; Creat Space Independent Publishing Platform; ISBN-10;1505817129, ISBN-3:978-1505817126,29 December 2014
5. Ways on Internet Advertising: Learn the Different Tratics of Online Advertising; Tim Deavin, Crate Space Independent Publishing Platform ; ISBN-10:1505017412, ISBN13:978-1505817416, 29 December 2014
6. Internet Advertising: Theory and research (Advances in Consumer Psychology); Shelly Rodgers (Editor), ESther Thorson(Editor); Psychology Press; ISBN-10:0805851097, ISBN-13:978-0805851090, 25 June 2007

E-Resources:
1. Social Media Marketing Workbook: How to Use Social Media for Business (2020 Updated Edition) by Jason McDonald
2. Google Ads (AdWords) Workbook: Advertising on Google Ads, YouTube, & the Display Network (2020 Edition) Kindle Edition by Jason McDonald

OE-5: Data Analytics for Journalism

Theory	00	Practical	40	Internal	10	Credits	3

COURSE OBJECTIVES

1. Learn the basics of Data Analytics
2. Use of Excel spreadsheets and various basic data functions of Excel
3. Learn various Excel functions to organize and query data
4. Learn how to set filters in data to selectively access data
5. Understand various charts and get to build own charts

COURSE OUTCOMES (CO)

1. Student can think critically about the uses of Data Analysis in Journalism
2. Student can Examine spreadsheet concepts and explore the Microsoft Office Excel environment
3. Student will obtain basic skills in Data Collection and Correction
4. Student will get working knowledge of Excel
5. Student will visualize data using appropriate tools

UNIT-1	Introduction to Data Analytics	L	T	P
1.1	Concepts of Data (Discussion, Assignment)	-	1	1
1.2	Concepts of Data Analytics (Discussion, Participation)	-	1	1
1.3	Data Analytics using Spreadsheets (Discussion, Practice)	-	1	1
1.4	Finding Stories in Spreadsheets (Discussion, Practice, Assignment)	-	1	1
1.5	Data Analysis and Management (Discussion, Quiz)	-	-	1

UNIT-2	Data Management Using Spreadsheet	L	T	P
2.1	Introduction to Spreadsheets (Discussion, Practice, Assignment)	-	1	1
2.2	Reading data into Excel using various formats (Discussion, Practice, Assignment)	-	1	1
2.3	Basic functions in Excel, arithmetic as well as various logical functions (Discussion, Practice)	-	1	1
2.4	Formatting rows and columns (Discussion, Practice)	-	1	1
2.5	Using formulas in Excel and their copy and paste using absolute and relative referencing (Practice)	-	-	1

UNIT-3	Data Management Using Spreadsheet	L	T	P
3.1	Spreadsheet Functions to Organize Data (Discussion, Practice)	-	1	1
3.2	IF and the nested IF functions (Discussion, Practice, Assignment)	-	1	1
3.3	VLOOKUP and HLOOKUP (Discussion, Practice)	-	1	1
3.4	The RANDBETWEEN function (Discussion, Assignment)	-	1	1
3.5	Spreadsheet Functions to Organize News Data – Case Study (Practice)	-	-	1

UNIT-4	Filtering, Pivot Tables, and Charts	L	T	P
4.1	Introduction to Filtering, Pivot Tables, and Charts (Discussion, Practice)	-	1	1
4.2	VLOOKUP across worksheets (Practice)	-	-	1
4.3	Data filtering in Excel (Discussion , Practice)	-	1	1
4.4	Use of Pivot tables with categorical as well as numerical data (Discussion, Practice)	-	1	1
4.5	Charting capability of Excel for News Data (Discussion, Practice)	-	1	1

UNIT-5	Advanced Graphing and Charting in Excel	L	T	P
5.1	Line, Bar and Pie charts. (Discussion, Practice)	-	1	1
5.2	Pivot charts (Practice)	-	-	1
5.3	Scatter plots (Discussion, Practice)	-	1	1
5.4	Histograms (Discussion, Practice)	-	1	1
5.5	Graphs and Charts for News Data (Discussion, Practice)	-	1	1

Practical / Projects/Assignments:
1. Work with Cells and Worksheets
2. Calculate the given Data
3. Format the Workbook
4. Add Charts and Graphics
5. Collaborate with Others
6. Analyze the given Data
7. Case study: When you get data in sentences: using SEARCH and error handling to extract numbers from phrases
8. Publishing live data in a live chart
9. Saving time to hit a deadline: repeating and fixing a calculation across cells
10. How to put the story into context, or looking from a fresh angle: merging data from different tables using VLOOKUP

Suggested Readings:
1. Spreadsheets for Journalism, Brant Houston, 2019
2. Finding Stories in Spreadsheets Paul Bradshaw
3. Microsoft Excel 2016 Bible: The Comprehensive Tutorial Resource by John Walkenbach, WILEY Publications, ISBN-13: 978-1119067511
4. Excel 2016 ALL-IN-ONE for Dummies by Greg Harvey, ISBN-13: 978-1119077152

E-Resources:
1. Learn excel - free online excel training accessed at https://trumpexcel.com/learn-excel/
2. Excel lecture notes accessed at https://owerricbt.files.wordpress.com/2017/02/excel-lecture-notes3.pdf

OE-6: Social Media Analytics

Theory	00	Practical	40	Internal	10	Credits	3

COURSE OBJECTIVES

1. Learn the basics of Data Analytics
2. To understand the different ways of collecting and extracting Social Media Data
3. Analyzing the extracted data using Statistical functions
4. Applying Sentiment analysis on the extracted Data
5. Visualizing the Data to Explore new trends, patterns and correlations

COURSE OUTCOMES (CO)

1. Student can collect data from different social media sources such as YouTube, Twitter
2. Student can Utilize various Application Programming Interface (API) services to collect data from different social media sources
3. Student can Process the collected data - primarily structured - using methods involving correlation, regression, and classification to derive insights about the sources and people who generated that data
4. Student can analyze the unstructured data - primarily textual comments - for sentiments expressed in them
5. Student can Use different tools for collecting, analyzing, and exploring social media data for research and development purposes

UNIT-1	Introduction to Data Analytics	L	T	P
1.1	Concepts of Social Media Data (Discussion, Assignment)	-	1	1
1.2	Concepts of Social Media Data Analytics (Discussion, Participation)	-	1	1
1.3	Kinds of Data - Structured and Unstructured (Discussion, Practice)	-	1	1
1.4	Analysis of Structured data and its benefits (Discussion, Practice, Assignment)	-	1	1
1.5	Visualizations for exploring and presenting data (Discussion, Quiz)	-	-	1

UNIT-2	Collecting and Extracting Social Media Data	L	T	P
2.1	Collecting data from Twitter and YouTube (Discussion, Practice, Assignment)	-	1	1
2.2	Introduction to Python programming (Discussion, Practice, Assignment)	-	1	-
2.3	Use of Python script (Discussion, Practice)	-	1	1
2.4	Use of Python script editing, to extract data from Twitter (Discussion, Practice)	-	1	1
2.5	Use of Python script editing, to extract data from YouTube	-	1	1

	(Discussion, Group activity)			

UNIT-3	Data Analysis, Visualization, And Exploration-I	L	T	P
3.1	Analyzing the data from various social media services (Discussion, Practice)	-	-	1
3.2	Basics of Data Analysis (Discussion, Practice, Assignment)	-	1	1
3.3	Statistical Analysis – correlation, regression and classification (Discussion, Practice, Quiz)	-	1	1
3.4	Analysis of Structured data (Discussion, Assignment)	-	1	1
3.5	Using the data collected from YouTube for Statistics Analysis (Discussion, Practice)	-	-	2

UNIT-4	Data Analysis, Visualization, and Exploration-II	L	T	P
4.1	Statistical Analysis Using R (Discussion)	-	1	1
4.2	Analysis of Unstructured data (Practice)	-	1	-
4.3	Sentiment Analysis (Practice)	-	1	1
4.4	Basics of Data Visualization (Discussion, Practice)	-	1	1
4.5	Visualizing the data from various social media services (Discussion, Practice)	-	1	1

UNIT-5	Case Studies	L	T	P
5.1	Case Study 1: Using Twitter, focus on unstructured data (in this case, text) (Discussion, Practice)	-	1	1
5.2	Case Study 1: Using Twitter, Sentiment Analysis with Python (Discussion, Practice)	-	1	1
5.3	Case Study 2: Basic text mining application using R (Discussion, Practice)	-	1	1
5.4	Case Study 2: Basic text mining application using R (Discussion, Practice)	-	1	1
5.5	Comparative study of tools used for Data Analysis, Visualization, and Exploration (Practice)	-	-	1

Practical / Projects/Assignments:
1. Installation and Configuration of Python and R
2. How to install new packages/libraries for Python and R
3. How to create developer accounts
4. What information to obtain to use the data collection APIs
5. Collecting data from Twitter and YouTube
6. Use of Python script editing, to extract data from Twitter and YouTube
7. Analyze the extracted Structured data
8. Analyze the extracted Unstructured data
9. Explore the different Data Visualization Patterns

Suggested Readings:
1. Social Media Analytics: Techniques and Insights for Extracting Business Value Out of Social Media by Matthew Ganis, AvinashKohirkar, 2016, Pearson Publishers, ISBN : 9789332578463
2. Learning Social Media Analytics with R by Raghav Bali, Dipanjan Sarkar, Tushar Sharma, May 2017, Packt Publishing, ISBN: 9781787127524

E-Resources:
1. Social Media Data Analytics accessed at https://www.upa.it/static/upload/the/the-fundamentals-of-social-media-analytics.pdf
2. Social Media Data Analytics accessed at https://ptgmedia.pearsoncmg.com/images/9780133892567/samplepages/9780133892567.pdf