

Model Curriculum for
B.Voc/ D.Voc
in
Graphics & Multimedia



All India Council for Technical Education
Nelson Mandela Marg, New Delhi

1. Introduction

All India Council for Technical Education (AICTE) Ministry of HRD, Government of India has introduced Entrepreneurship oriented Skill development courses of B.Voc/D.Voc/Skill Diploma. These courses will be run by AICTE approved institutes by using available infrastructure and facilities. In these courses the institute will conduct general education content and sector specific skills will be imparted by Skill Knowledge Providers/ Training Providers/ Industries.

1.1 Key Features:

Objectives

- To provide judicious mix of skills relating to a profession and appropriate content of General Education.
- To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
- To provide flexibility to the students by means of pre-defined entry and multiple exit points.
- To integrate NSQF within the Diploma, undergraduate level of higher education to enhance employability of the students and meet industry requirements. Such student apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
- To provide vertical mobility to students admitted in such vocational courses.
- The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in Graphics & Multimedia and will be offered by respective affiliating University/Board of Technical Education.
- Students may be awarded Level Certificate/Diploma/Advance Diploma /Degree as out-lined in the Table below:

Award	Duration after class X	Corresponding NSQF level
Level 3 Certificate	1 Year	3
Level 4 Certificate	2 Years	4
Diploma	3 Year	5
Advance Diploma	4 Years	6
B.Voc Degree	5 Years	7

2. Course Objectives

After successfully completing the vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Graphics & Multimedia so that he/she is properly equipped to take up gainful employment in this Vocation. Thus he/she should have

acquired:-

A. Adequate Professional Skills and Competencies in

- (a) Testing different 2D/3D components.
- (b) Testing the performance of Graphics & Multimedia.
- (c) Locating the fault at component level and at the stage level.

B. A Healthy and Professional Attitude so that He/She has

- (a) An analytical approach while working on a job.
- (b) An open mind while locating/rectifying faults.
- (c) Respect for working with his/her own hands.
- (d) Respect for honesty, punctuality and truthfulness

c. NSQF compliant skills in Qualification developed by sector skill council in Media sector

2. Course Structure

The course will consist of combination of practice, theory and hands on skills in the Graphics & Multimedia sector.

Curriculum

The curriculum in each of the years of the programme would be a suitable mix of general education and skill components.

Skill Components:

- The focus of skill components shall be to equip students with appropriate knowledge, practice and attitude, to become work ready. The skill components will be relevant to the industry as per its requirements.
- The curriculum will necessarily embed within itself, National Occupational Standards (NOSs) of specific job roles within the industry. This would enable the students to meet the learning outcomes specified in the NOSs.
- The overall design of the skill development component along with the job roles selected will be such that it leads to a comprehensive specialization in few domains.
- The curriculum will focus on work-readiness skills in each of the year of training.
- Adequate attention will be given in curriculum design to practical work, on the job training, development of student portfolios and project work.

General Education Component:

- The general education component adhere to the normal senior secondary and university standards. It will emphasize and offer courses which provide holistic development. However, it will not exceed 40% of the total curriculum.
- Adequate emphasis is given to language and communication skills.

The curriculum is designed in a manner that at the end of each year after class Xth students can meet below mentioned level descriptors of NSQF:

Level	Process required	Professional Knowledge	Professional skill	Core skill	Responsibility
Level 3	Person may carry out a job which may require limited range of activities routine and predictable	Basic facts, process and principle applied in trade of employment	Recall and demonstrate practical skill, routine and repetitive in narrow range of application	Communication written and oral with minimum required clarity, skill of basic arithmetic and algebraic principles, personal banking, basic understanding of social and natural environment	Under close supervision some responsibility for own work within defined limit
Level 4	Work in familiar, predictable, routine, situation of clear choice	Factual knowledge of field of knowledge or study	Recall and demonstrate practical skill, routine and repetitive in narrow range of application, using appropriate rule and tool, using quality concepts	Language to communicate written or oral, with required clarity, skill to basic arithmetic and algebraic principles, basic understanding of social political and natural environment	Responsibility for own work and learning
Level 5	Job that requires well developed skill, with clear choice of procedures in familiar context	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools materials and information	Desired mathematical skill, understanding of social, political and some skill of collecting and organizing information, communication.	Responsibility for own work and learning and some responsibility for other's works and learning

Level 6	Demands wide range of specialized technical skill, clarity of knowledge and practice in broad range of activity involving standard/ non-standard practices	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Reasonably good in mathematical calculation, understanding of social, political and reasonably good in data collecting organizing information, and logical communication	Responsibility for own work and learning and full responsibility for other's works and learning
Level 7	Requires a command of wide ranging specialized theoretical and practical skill, involving variable routine and non-routine context	Wide ranging, factual and theoretical knowledge in broad contexts within a field of work or study	Wide range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Good logical and mathematical skill understanding of social political and natural environment good in collecting and organizing information, communication and presentation skill	Full responsibility for output of group and development

Curriculum for Graphics & Multimedia

Level	Code	Educational Component	Credit	Marks	
3 Semester I	Theory				
	3.GE.01	Language – I	3	50	
	3.GE.02	Applied Chemistry	3	50	
	3.GE.03	Applied Physics	3	50	
	3.GE.04	Applied Mathematics-I	3	50	
	Lab/Practical				
	3.GP.01	Applied Chemistry Lab	1.5	50	
	3.GP.02	Applied Physics Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	Set Painter MES/Q3104		(Any one)	15	200
	Sound Assistant MES/Q3403				
Clean-up Artist MES/Q0506					
Roto Artist MES/Q3504					
3 Semester II	Theory				
	3.GV.01	General Foundation Course –I	3	50	
	3.GV.02	IT Tools (795)	3	50	
	3.GV.03	Design & Innovation (772)	3	50	
	3.GV.04	Applied Mathematics – II	3	50	
	Lab/Practical				
	3.VP.01	Design & Innovation -Lab	1.5	50	
	3.VP.02	IT Tools Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	Any one of the QP's can be opted as offered in Semester I		(Any one)	15	200
4 Semester I	Theory				
	4.GV.01	Graphic Design (071)	3	50	
	4.GV.02	Geospatial Technology (740)	3	50	
	4.GV.03	IT foundations & Programming Concept	3	50	
	4.GE.01	Language – II	3	50	
	Lab/Practical				
	4.VP.01	Graphic Design -Lab	1.5	50	
	4.VP.02	Geospatial Technology-Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	VFX Editor MES/Q3501		(Any one)	15	200

Level	Code	Educational Component	Credit	Marks
	Layout Designer MES/Q0503			
	Voice Over Artist MES/Q0101			
4 Semester II	Theory			
	4.GV.04	General Foundation Course –II	3	50
	4.GV.05	Engineering Graphics	3	50
	4.GV.06	Multimedia & Web Technology	3	50
	4.GV.07	Computer Networks	3	50
	Lab/Practical			
	4.VP.03	Engineering Graphics – Lab	1.5	50
	4.VP.04	Multimedia & Web Technology – Lab	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
Any one of the QP's can be opted as offered in Semester I		(Any one)	15	200
5 Semester I	Theory			
	5.GV.01	Web Applications	3	50
	5.GV.02	Communication Skill-I	3	50
	5.GV.03	Graphic Design (Basic Sketching and Human Anatomy in Drawing)	3	50
	5.GV.04	Illustration And Photo-Editing	3	50
	Lab/Practical			
	5.VP.01	Web Applications –Lab	1.5	50
	5.VP.02	Illustration And Photo-Editing –Lab	1.5	50
	On-Job-Training (OJT)/Qualification Packs			
	Character Designer MES/Q0502		(Any one)	15
Storyboard Artist MES/Q0507				
Editor MES/Q1401				
5 Semester II	Theory			
	5.GV.05	Pre-Production	3	50
	5.GV.06	Audio Editing	3	50
	5.GV.07	Video Editing	3	50
	5.GV.08	Communication Skill- II	3	50

Level	Code	Educational Component	Credit	Marks	
	Lab/Practical				
	5.VP.03	Audio Editing-Lab	1.5	50	
	5.VP.04	Video Editing-Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	Any one of the QP's can be opted as offered in Semester I		(Any one)	15	200
6 Semester I	Theory				
	6.GV.01	Principles of Animation and Techniques of Animation	3	50	
	6.GV.02	Basic of 3-D Modelling	3	50	
	6.GV.03	Texture and Lighting	3	50	
	6.GV.04	Communication Skill-III	3	50	
	Lab/Practical				
	6.VP.01	Digital Animation with Flash - Lab	1.5	50	
	6.VP.02	Maya - Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	Modeller MES/Q2501		(Any one)	15	200
	Animator MES/Q0701				
	Rendering Artist MES/Q3503				
6 Semester II	Theory				
	6.GV.05	3 D Animation	3	50	
	6.GV.06	Introduction to 3 D Motion Graphics & VFX	3	50	
	6.GV.07	Introduction to Rendering	3	50	
	6.GV.08	Communication Skill-IV	3	50	
	Lab/Practical				
	6.VP.03	3 D Animation Lab	1.5	50	
	6.VP.04	Rendering-Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	Any one of the QP's can be opted as offered in Semester I		Any one)	15	200
7 Semester I	Theory				
	7.GV.01	Digital Compositing	3	50	
	7.GV.02	3 D Texturing	3	50	

Level	Code	Educational Component	Credit	Marks	
	7.GV.03	Basic of Accounts-I	3	50	
	7.GV.04	Computer Graphics	3	50	
	Lab/Practical				
	7.VP.01	Digital Compositing-Lab	1.5	50	
	7.VP.02	3 D Texturing -Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
	Compositor MES/Q3505		(Any one)	15	200
	Texturing Artist MES/Q2503				
	Rigging Artist MES/Q2502				
7 Semester II	Theory				
	7.GV.05	Muscle System	3	50	
	7.GV.06	Rigging	3	50	
	7.GV.07	Advanced Modelling with Z - Brush	3	50	
	7.GV.08	Basics of Accounts-II	3	50	
	Lab/Practical				
	7.VP.03	Maya Muscle – Lab	1.5	50	
	7.VP.04	Rigging with Maya Lab	1.5	50	
	On-Job-Training (OJT)/Qualification Packs				
Any one of the QP's can be opted as offered in Semester I		(Any one)	15	200	

Detailed Curriculum

Level 3 (Semester I)

(3.GE.01) Language - I

Module 1: Reading comprehension (prescribed texts) and functional grammar

A variety of genres – short stories, expository pieces, biographies, poems, plays, newspaper and magazine excerpts have been included. Teaching of grammar has been integrated with the reading texts. The emphasis is on functional grammar.

The following ten prose texts and five poems have been selected for development of different reading skills.

Prose texts (Prescribed)

1. A warmer or a colder earth (popular science) Arthur – C. Clark
2. The tiger in the tunnel (narrative) – Ruskin Bond.
3. First two or four pages from Sunny Days (autobiographical) – By Sunil Gavaskar
4. Case of suspension (narrative)
5. Big brother (narrative) Shekhar Joshi
6. Father, dear father (news paper article from the Hindu)
7. Face to face (autobiographical) Ved Mehta
8. I must know the truth (narrative) Sigrun Srivastva
9. If I were you (play) Douglas James
10. India, her past and her future (speech) Jawahar Lal Nehru

Poems

1. Leisure – WH Davis
2. The road not taken – Robert Frost
3. Where the mind is without fear- Tagore
4. My grandmother's house – Kamla Das
5. The night of the scorpion – Nissi, Ezekiel

Non prescribed

In this section learners will be exposed to newspaper, articles, tables, diagrams, advertisements etc. which they have to read carefully and interpret. In the examination similar pieces will be used.

Grammar and usage:

The following points of grammar and usage have been selected from the reading passages.

1. agreement/concord: number – gender etc.
2. Tenses: simple past (negatives/interrogatives) present perfect, past perfect continuous, past perfect, expressing future time (will and going to)
3. Passive voice (perfect tenses and modals)
4. Modals (must, should, ought to, would)
5. Linking words (to like because although, instead of, if, as, since, who, which that, when however, in spite of)
6. Reported speech, statements, questions (yes/no)

Module 2: Functional writing and study skills

This module help the learner to write descriptive and narrative paragraph, letters, reports notices etc. and also practice skills of note making

1. Paragraph writing
 - Describing objects
 - Describing people
 - Narrating events, stories
2. Letter writing
 - Application for leave
 - Application for jobs
 - Asking for information form various agencies (e.g. Last date for getting prospects; price of items before placing doers etc.)
3. Note making
4. Ending (punctuation, spelling, appropriate vocabulary, structures)

(3.GE.02) Applied Chemistry

1. Structure of Atom:

Rutherford model of the structure of atom, Bohr's theory of electrons, quantum numbers and their significance, de-Broglie equation and uncertainty principle, electronic configuration of 1 to 30 elements.

2. Periodic Properties of Elements:

Periodic law, periodic table, periodicity in properties like atomic radii and volume, ionic radii, ionization energy and electron affinity. Division of elements into s, p, d and f blocks.

3. Chemical Bonds:

Electrovalent, covalent and coordinate bond and their properties. Metallic bonding (electron cloud mode) and properties (like texture, conductance, luster, ductility and malleability).

4. Fuel and their Classification:

Definition, characteristics, classification into solid, liquid and gaseous fuel. Petroleum and brief idea of refining into various factions and their characteristics and uses. Calorific value of fuel, Gaseous fuels- preparation, properties, composition and use of producer gas, water and oil gas.

5. Water:

Impurities in water, methods of their removal, hardness of water, its types, causes and removal, disadvantages of hard water in boilers, pH value and its determination by calorimetric method.

6. Corrosion:

Its meaning, theory of corrosion, prevention of corrosion by various methods using metallic and non-metallic coatings.

7. Plastic and Polymers:

Plastic-thermo-plastic and thermo-setting. Introduction of Polythene. P.V.C. Nylon, synthetic rubber and phenol-formal-dehyde resin, their application in industry.

(3.GE.03) Applied Physics

1. **Units & Dimensions:** M.K.S. fundamentals & derived units, S.I. base units supplementary units and derived units, Dimensions of various physical quantities, uses of dimensional analysis.
2. **Surface Tension and Viscosity:** molecular forces, molecular theory of surface tension, surface energy, capillary action, concept of viscosity, coefficient of viscosity, principle and construction of viscometers.
3. **Vibrations:** Vibration as simple spring mass system, elementary and qualitative concept of free and forced vibrations, resonance. Effects of vibrations on building bridges and machines members.
4. **Heat:** Temperature and its measurement, thermoelectric, platinum resistance thermometers and pyrometers. Conduction through compound media and laws of radiations.
5. **Ultrasonics:** Productions of ultrasonic waves by magnetostriction and piezo-electric effect, application of ultrasonics in industry.
6. **Optics:** Nature of light, reflection and refraction of a wave from a plane surface. Overhead projector and Epidiascope.

(3.GE.04) Applied Mathematics - I**Sets, Relations and Functions**

1. Sets
2. Relations and Functions-I
3. Trigonometric Functions-I
4. Trigonometric Functions-II
5. Relation between Sides and Angles of A triangle

Sequences and Series

1. Sequences and Series
2. Some Special Sequences

Algebra-I

1. Complex Numbers
2. Quadratic Equations and Linear inequalities
3. Principle of Mathematical Induction
4. Permutations and Combinations
5. Binomial Theorem

Co-ordinate Geometry

1. Cartesian System of Rectangular Co-ordinates
2. Straight Lines
3. Circles
4. Conic Sections

Statistics and Probability

1. Measures of Dispersion
2. Random Experiments and Events
3. Probability

(3.GP.01) Applied Chemistry - Lab

1. Proximate analysis of solid fuel.
2. Experiments based on Bomb Calorimeter.
3. Determination of turbidity in a given sample.
4. To determine the flash and fire point of a given lubricating oil.
5. To determine the viscosity of a given lubricating oil by Redwood viscometer.
6. To determine cloud and pour point of a given oil.

(3.GP.02) Applied Physics – Lab

1. To determine the surface tension of a liquid by rise in capillary.
2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using a sonometer.
4. To determine the frequency of AC main using sonometer.
5. Time period of a cantilever.

Level 3 (Semester II)

(3.GV.01) General Foundation Course – I

A. Business Management and Entrepreneurship

- (a) **Entrepreneurship Orientation**
Importance and relevance in real life: Emphasis on self-employment.
- (b) **Entrepreneurship Values and Attitudes**
Innovativeness, Independence, Risk Taking, Analytical ability.
- (c) **Entrepreneurial Motivation**
Achievement Planning, personal efficacy, entrepreneurial goal setting.
- (d) **Launching of a Business Venture**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills

- (a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm.
- (b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere.

C. Environmental Education

- (a) Environment and the society.
- (b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.
- (c) Poverty and environment.

D. Rural Development

- (a) Agriculture, the back bone of Indian Economy.
- (b) Rural development projects in India including Integrated rural development programme.
- (c) Agro based rural industries.
- (d) Community approach to rural development.

(3.GV.02) IT Tools

- I. Computer Organization & OS: User perspective.
 - Understanding of Hardware.
 - Basics of Operating System.
- II. Networking and Internet.
 - Network Safety concerns.
 - Network Security tools and services.
 - Cyber Security.
 - Safe practices on Social networking.
- III. Office automation tools:
 - Spreadsheet.

- Word processing.
- Presentation.
- IV. Multi Media Design: (Open Source Design Tools)
 - Interface and Drawing Tools in GIMP.
 - Applying Filters.
 - Creating and handling multiple layers.
 - Using Stamping and Smudging tools.
 - Importing pictures.
- V. Troubleshooting: Hardware, Software and Networking.
 - Commonly encountered problems.
 - (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed).
- VI. Work Integrated Learning IT – ISM
 - Identification of Work Areas.
 - Work Experience.

(3.GV.03) Design & Innovation

Unit-1: Introduction to Design

Session-1: Concept of Design

- Design Definition.
- Design versus Art.
- Design and Environment.
- The basis of Design Process.
- Use Design in today's scenario.

Session-2: Design Fundamental

- Principles of Design.
- Elements of Design.
- Colour Theory.
- Understanding of Color wheel.
- To increase and build sensitivity to the forms around them.
- To identify the revolving still life and outdoor in vicinity of environment.
- To relate the elements of design to understand design process for their projects.
- Understanding the colour quality, intensity, relationship with other colours, textures, shape.

Unit-2: Design Tools and Techniques

Sessions-1: Produce Drawing

- Defining Drawing.
- Different techniques of drawing.
- Exploration of medium.
- Compositions and Perspectives.
- Tonal Techniques.
- Use of Dreams and Music for creative Drawing.
- To identify the use of tone and value, Texture/Frottage.

- Identify to use contour line drawing (continuous or cross contour).

Unit-3: Occupational Health and Safety

Session-1: Work Safe Review Module

- Safety and Health responsibility.
- Role of War safe Inspector.
- Hazard identification, Risk assessment and Risk control.
- PPE.
- Dealing with emergency.
- Design a promotional poster advertising what students need to know about Safety and Dangers, or be warned about while working at College.

(3.GV.04) Applied Mathematics - II

Algebra-II

1. Matrices
2. Determinants
3. Inverse of a Matrix and its Applications

Relations and Functions

1. Relations and Functions-II
2. Inverse Trigonometric Functions

Calculus

1. Limits and Continuity
2. Differentiation
3. Differentiation of Trigonometric functions
4. Differentiation of Exponential and Logarithmic functions
5. Application of Derivatives
6. Integration
7. Definite Integrals
8. Differential Equations

Vectors and Three Dimensional Geometry

1. Introduction to Three Dimensional Geometry
2. Vectors
3. Plane
4. Straight Line

Linear Programming and Mathematical Reasoning

1. Linear Programming
2. Mathematical Reasoning

(3.VP.01) Design & Innovation Lab

Practical Workshop

Session-1: Knowledge Workshop

- Source and apply design industry knowledge.

- Source and apply information on the history and theory of design.
- Project 1: Research on a Contemporary designer.
- Project 2: Photograph and Report on Signage and Window display.
- Project 3: Critique the Design of a Product.

Session-2: Design Concepts Workshop

- Design concepts workshop road signs.
- Design concepts workshop zoological and botanical logo.
- Design concepts workshop T-shirts design.

Session-3: Graphic Design Workshop

- Produce Designs for Clothing Range, Shoes or CD Cover.
- Color zones applied Colour assessment.
- Poster Design for an Opera or Ballet.

(3.VP.02) IT Tools Lab

- Spreadsheets, Word, Presentation
- Multimedia Design
- Troubleshooting
- Project / Practical File
- Viva Voce

Level 4 (Semester I)**(4.GV.01) Graphic Design****UNIT-I Design Processes and Practices**

1. Role of Design in Society
 - a) Functions of Design
 - b) Implications and Impact of Graphic Design
 - c) Role of Graphic Designer
 - d) Contemporary Graphic Design in India
2. Graphic Design Processes
 - a) Methodology of Graphic Design

UNIT-II Principles and Elements of Design

3. Sketching and Drawing
 - a) Introduction to Drawing: an aid in visual representation
 - b) Types of drawing
 - Drawing from memory and imagination
 - Drawing from observation
 - Drawing from Dimensional information
 - c) Virtues of drawing
4. Colour
 - a) Colours theories
 - b) Colour wheel
 - c) Colour Harmonies or Colour Schemes
 - d) Colour Symbolism
5. Fundamentals Visual Composition
 - a) Introduction
 - b) Principles and Elements of Composition
6. Typography
 - a) Classification
 - b) Anatomy of Font
 - c) Features of a Font
 - d) Text Formatting
 - e) Multilingual Typography
7. Principles of Layout Design
 - a) Theme and content
 - b) Types of Layout
 - c) Colours in Layout
 - d) Copy and Type
 - e) Design for Publication

UNIT-III Media and Design

8. Digital Imaging and Printing
 - a) Types of Digital Images
 - b) Digital image Editing

- c) Digital Printing
- 9. Advertising Design
 - a) What is Media Planning
- 10. Campaign Design
 - a) Kinds of Campaign
 - b) Planning a Campaign
 - c) Research & Data Collection
 - d) Creative Aspects
 - e) Developing a Concept
 - f) Departments of an Advertising Agency
- 11. Integrated Methods of Advertising
 - a) Kinds of Events
 - b) Public Relations
 - c) Media
 - d) Visual Communication and its Impact
- 12. Graphic Design for Interactive Media
 - a) Basic Concepts
 - b) Types of Websites
 - c) The Website Development and Management Process
 - d) Graphic Design Approach
 - e) Designing Navigation

(4.GV.02) Geospatial Technology

Chapter-1: Remote Sensing (RS)

- Introduction.
- Spectral Reflectance Signature.
- Digital Image Processing.
- Visual Interpretation of Satellite data.
- Aerial Photo and Its Interpretation.
- Advanced Remote Sensing Technologies.
- Advantages and Benefits of RS.

Chapter-2: Geographic Information System (GIS)

- Introduction.
- GIS Data Element and Data Structure.
- Fundamentals of Database Concept.
- Data Input to GIS System.
- GIS Data Editing.
- Attribute Data Linking.
- Spatial and Non Spatial data Analysis.
- Map Projection and Coordinate System.
- Digital Cartography.
- Advantages and Benefits of GIS.

Chapter–3: Global Positioning System (GPS)

- Introduction.
- GPS Accuracy and Accuracy factors.
- Types of GPS.
- List of Global Navigation System.
- GPS Today & Limitations of GPS.
- Uses of GPS Technology.

Chapter–4: Trends in Geospatial Technology

- Introduction.
- Remote Sensing Trends & Technology.
- GIS Trends & Technology.
 - i. Web Based GIS.
 - ii. Enterprise GIS.
 - iii. Mobile GIS.
 - iv. 3-D Visualization and Fly through.
 - v. Open GIS.
- GPS Trends & Technology.

Chapter–5: Applications of Geospatial Technology

- Water shed Studies.
- Flood Studies.
- Ground water Studies.
- Health Issues.
- Utility Studies.
- Security and Defense Studies.
- Urban and infrastructure Studies.

(4.GV.03) IT Foundations & Programming Concept

- Introduction: Introduction to computer system, uses, types.
- Data Representation: Number systems and character representation, binary arithmetic
- Human Computer Interface: Types of software, Operating system as user interface, utility programs
Devices: Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter
- Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks
- Computer Organisation and Architecture: C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.
- Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

- Use of Computers in Education and Research: Data analysis, Heterogeneous storage, e-Library, Google Scholar, Domain specific packages such as SPSS, Mathematics etc.
- Basic programming elements and concepts in C++

(4.GE.01) Language - II

Module – 3: Listening and speaking skills

In this module the learners will be exposed to a variety of listening activities recorded on audiotapes. These will be samples of good spoken English, which the learners can use as models. Work sheets will accompany the listening material.

This module will include the following:

1. Introducing yourself/friends in formal and informal situations.
2. Inviting people (over the phone and face to face) giving details of occasion, time place and date. Acceptance and refusal of invitation – formal and informal.
3. Seeking and supplying information (example opening an account in a bank, applying for loans etc.)
4. Talking and conveying messages (over the phone and face to face).
5. Giving directions / instruction.
6. Discussing contemporary issues related to environment, child labour, gender bias etc.
7. Listening to excerpts form television and radio.
8. Listening to poems/plays (prescribed).
9. Listening to speeches / talks.
10. Listening to songs like “We shall overcome”.

Module – 4 to 6

(English for specific purposes) (opt any one)

There modules are being offered. A learner has to opt for any one. The first is for academic purposes and the next two are for vocational purposes. The focus is not on the teaching of the subject matter like science and literature but on the way in which language is used in the deferent subjects.

Module 4: English for Science

This course will introduce learners to some interesting pieces of popular science

1. Health and hygiene
2. Conservation of (nearly extinct) animals.
3. Plant life.
4. Bio gas / solar energy.

These pieces illustrate the use of English in scientific writing: giving information factually, logically and objectively.

Module 4: English for Receptionist

This module will introduce the learners to a variety of exercises, tasks and meaningful activities related to the receptionist’s use of English. The printed course materials will be supported by tapes. The following competencies be developed:

1. Receiving messages, making request etc.
2. Supplying information

3. Giving advice and making suggestions
4. Dealing with complaints
5. Making entries in an appointment book, register etc.

Module 4: English for Office Use

This course will help the learner to use English effectively and appropriately in the office environment. The competencies will be developed.

1. Using the telephone taking and passing messages.
2. Receiving messages
3. Marking noting on files and circular.
4. Writing office notes, memos, notices, agendas for meetings.
5. Telegrams and fax messages.
6. Writing business letters, application enquires, complaints.
7. Filling in forms, cheques, pay in slips etc.

(4.VP.01) Graphic Design Lab

1. (i) Functions of Design
(ii) Graphic Design Process
2. (i) Types of Drawing
(ii) Colour and its Theories
(iii) Elements of Composition
(iv) Types of Layout and a Complete Design for Publication.
3. (i) Types of Digital Images, Editing and Printing
(ii) Advertisement Design Planning
(iii) Means of Campaign Designing
(iv) Types of Visual Communication and Design a Poster/Hoarding/Book-cover, etc.
(v) Layout of a Website Home - Page on a Chosen Field.
(Institution/organization/sports/art/event etc.)

(4.VP.02) Geospatial Technology Lab

- Data Input to GIS System.
- GIS Data Editing.
- Attribute Data Linking.
- Spatial and Non Spatial data Analysis.
- Map Projection and Coordinate System.
- Digital Cartography.
- Advantages and Benefits of GIS.

Level 4 (Semester II)

(4.GV.04) General Foundation Course – II

A. Business Management and Entrepreneurship

Management of Business, Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a) Basic Function (b) Marketing Management (c) Financial Management (d) Production Management (e) Personnel Management

B. Computational Skills

1. (a) Solution of linear equations and their application to problem of commercial mathematics.
(b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.
2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers.

C. Environmental Education & Rural Development

Environmental Education:

- a. Modernization of agriculture and environment, irrigation, water logging, use of fertilizers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.
- b. Rational utilization, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. Rural Development

Principles and goals of rural development, major problems/constraints in rural development in India.

(4.GV.05) Engineering Graphics

Unit I: Isometric Projection of Solids

- i. Construction of isometric scale showing main divisions of 10mm and smaller divisions of 1mm, also showing the leading angles. Drawing helping view/s such as triangles, pentagon, hexagon, etc., using isometric scale.
- ii. Isometric projection (drawn to isometric scale) of solids such as cube, regular prism and pyramids (triangular, square, pentagonal and hexagonal), cone, cylinder, sphere, hemisphere, frustum of right regular pyramids (triangular, square, pentagonal, hexagonal) and cone, when they are cut by a plane parallel to the base. The axis and the base side of the solid should be either perpendicular to HP / VP or parallel to HP and VP. (Indicate the direction of viewing)

- iii. Combination of two solids (except "frustum" of Pyramids and Cone) Keeping the base side parallel or perpendicular to HP/VP and placed centrally together, axis of both the solids should not be given parallel to HP.

Unit II: Machine Drawing

A. Drawing of machine parts

- i. Drawing to full size scale with instruments.
Introduction of threads: Standard profiles of screw threads square, knuckle, B.S.W., Metric (external and internal). Bolts (Square, Hexagonal, Tee and Hook); Nuts: (Square and Hexagonal), Plain washer, combination of nut and bolt with or without washer for assembling two parts together, Single riveted lap joint with standard dimensions.
- ii. Free-hand sketches
Conventional representation of external and internal threads; studs (plain, square-neck and collar); screws (round-head, cheese-head, 900 flat counter sunk-head, hexagonal socket head and grub-screw). Types of rivets:- snap head, pan head-without tapered neck, flat head and 600 countersunk flat head. Types of sunk-keys (rectangular taper, woodruff and double-head feather key with gib head on both ends).

B. Assembly drawings and Dis-Assembly drawings

(4.GV.06) Multimedia & Web Technology

Unit 1: Introduction to Database Management

- Introduction to database concepts and its need
- Database Terminology: Data, Record/Tuple, Table, Database, field/attribute
- Concept of Keys: Candidate key, Primary key, Alternate key, and Foreign key
- Examples of common Database Management System: MySQL, Ingres, Postgres, Oracle, DB2, MS-SQL Server, Sybase etc.
- Database Tool:
Introduction to MySQL: Using MySQL creating Database and table, defining primary key, inserting records, displaying records using SELECT command, WHERE clause, modifying records using UPDATE, deleting records

Unit 2: Networking And Open Standards

- Computer Networking: Evolution of Networking: ARPANET, WWW, Internet
- Network Topologies: Bus, Star, Tree
- Types of Network: PAN, LAN, WAN, MAN
- Wired Technologies: Twisted pair cable, coaxial cable, optical fiber
- Wireless Technologies: Bluetooth, infrared, radio link, microwave link, radio link and satellite link
- Network devices: MODEM, Hub, switch, repeater, gateway – and their functions

- Identifying computers and users over a network: Basic concept of domain name, MAC (Media Access Control) and IP Address, domain name resolution
- Wireless/Mobile Communication: GSM, CDMA, GPRS, WLL, 3G, 4G
- Internet Applications: SMS, Voice mail, e-Mail, Chat and Video conferencing
- Network Security Concepts: Cyber law, firewall, cookies, hackers and crackers
- Open Source Concepts: Proprietary and open source software(OSS), common FOSS/FLOSS examples (e.g. GNU/Linux, Firefox, OpenOffice, Linux, Mozilla web browser, Apache server, MySQL, Postgres, Pango, Tomcat, PHP, Python)
- Indian Language Computing: character encoding, UNICODE, different types of fonts (open type vs true type, static vs dynamic), Entering Indian Language Text – phonetic and key map based

Unit 3: Web Page Development

- Review of HTML/DHTML, JavaScript covered in Class XI
- Installation and Managing WEB-Server: IIS/XAMPP/LAMP;
- PHP: Concept of PHP, features of PHP, other equivalent tools – JSP, PHP
- Including PHP in web page
- Data types: integer, double, string, boolean, null, array, object
- Variables: Using variables in PHP
- Constants: Using constants in PHP, constant() function
- Output data to Screen: echo and print statements
- Operators:
 - a) Arithmetic operators: +, - (Unary and Binary), *, /, %, **
 - b) Assignment operators : =, +=, -=, *=, /=, %=
 - c) String operator: ., . =
 - d) Comparison operators: <, >, <=, >=, !=, ==, ===, !==
 - e) Incrementing/Decrementing operators: ++, --
 - f) Logical operators: !, &&, ||;
 - g) Array Operators: union(+), equality ==, inequality <>, !=
- Operator precedence
- Built In Functions:
 - String Manipulation Functions: strtoupper(), strtolower(), strlen(), ltrim(), substr(), rtrim(), trim(), strrev(), strcmp(), strpos(), stripslashes(), strchr(), strpos(), strippos()
 - Time & Date Functions: Date(), getdate(), gettimeofday(), Mktime(), strtotime(), cal_days_in_month()
 - Arrays: Declaration and use of indexed arrays(1 dimensional), inbuilt functions sort(), rsort()
 - Conditional statements: if, if else, if...elseif....else, switch
 - Loops: while, do while, for, for each
 - Unconditional exit from loop /switch using break
 - User Defined Functions: Defining a function, calling/invoking a function,
 - Passing parameters/arguments, Pass by value, pass by reference, return value, default value
 - Global Variables – Superglobals
\$GLOBALS, \$ _SERVER, \$ _REQUEST, \$ _POST, \$ _GET, \$ _FILES, \$ _ENV, \$ _COOKIE, \$ _SESSION

- Elements of \$_SERVER: PHP_SELF, SERVER_NAME, HTTP_HOST, HTTP_USER_AGENT
- PHP Forms
- Form Handling, Form Validation, Form URL/E-mail
- Text Files:
Opening a file, Reading a file, Writing a file, Closing a file
- Other Features
PHP File Upload, Cookies, Sessions (start, modify and destroy), Error Handling
- Working on Database: (Using MySQLi Procedural API) Connecting with Databases, opening and closing databases, Inserting, retrieving, modifying/updation , deleting of records from tables

Unit 4: Multimedia and Authoring Tools

- Movie File Formats: AVI, MPEG, SWF, MOV, DAT
- Embedding: Audio/Video on the web page
- Multimedia Authoring Using Macromedia Flash: Making of simple movie, setting properties, frame rate, dimensions, and background color
- Movie Frames: Concept of frame, frame buffer, and frame rate, creating a key frame, Inserting text into the frame, inserting graphical elements into the frame, converting text/graphics to symbol, inserting symbol into the frame, setting symbol property (graphics/button/movie), inserting blank key frame, selecting all/specific frames of a layer, copying/pasting selected frames
- Scene: Concept of scene, duplicate scene, add scene, delete scene, and navigating between scenes
- Layers: Concept of layer, layer properties, layer name, show/hide/lock layers, viewing layer as outline, adding/deleting a layer
- Types of Layer - normal/guide/mask
- Special Effects: Motion Tweening, Shape Tweening, Inserting Sound Layer
- Testing a Scene and Movie
- Multimedia Application: Education (use of CAL tool), entertainment, edutainment, virtual reality, digital libraries, information kiosks, video on demand, video phone, video conferencing and telemedicine.

(4.GV.07) Computer Networks

UNIT-I

Introduction to computer Network - Communication: An Essential Part of Our Lives, Communicating in a Network-Centric World, Network as a Platform, Architecture of the Internet, Trends in Networking

Communicating over the Network - Platform for Communications, LANs, WANs, and Internetworks, Protocols, Using Layered Models, Network Addressing

UNIT-II

Application Layer Functionality and Protocols - Applications: The Interface Between the Networks, Making Provisions for Applications and Services, Application Layer Protocols and Services

Examples

OSI Transport Layer - Roles of the Transport Layer, IPv4 Addresses, TCP: Communicating with Reliability, UDP: Communicating with Low Overhead

UNIT-III

OSI Network Layer - IPv4, Networks: Dividing Hosts into Groups, Routing, How Data Packets Are Handled, Routing Processes

Addressing the Network- IPv4 Addresses for Different Purposes, Assigning Addresses, Calculating Addresses, Testing the Network Layer

OSI Data Link Layer - Data Link Layer, MAC Techniques, MAC Addressing and Framing Data

(4.VP.03) Engineering Graphics Lab

(i) To perform the following tasks from the given views of the prescribed Machine

Block (One).

Value-Points

1. Copy the given views
2. Drawing the missing view without hidden lines
3. Sketching the Isometric view without hidden edges
4. To make the machine block of the above in three dimensions.

(ii) Computer Aided Design (CAD) – Project

Project file to be submitted on the simple solids (Prism, Pyramids and Frustums of equilateral triangle, square, pentagon and hexagon) or machine blocks as prescribed in part-I by using the CAD software.

(4.VP.04) Multimedia & Web Technology Lab

Practicals based on the theory covered in class

Level 5 (Semester I)

(5.GV.01) Web Applications

Movie Editing Tools.

- Familiarization of interface components.
- Importing pictures.
- Importing Audio and Video Files.
- Splitting and Joining Movie Clips.
- Adding Titles and publishing.

Customizing and Embedding Multimedia components in Web Pages.

- Compatible Multimedia file formats for Web Pages.
- Embedding Audio file.
- Embedding Video file.
- Embedding Flash file.

Web Scripting – Java Script.

- JavaScript review.
- Functions – user defined.
- String Object.
- Math Object.
- Array Object.
- Events.
- Case Studies.

Work Integrated Learning IT – WA-II.

- Advanced Features of Web Design.
- Code view, Add-ins / Snippets and Page Transitions.
- Dynamic Web templates.
- SEO - Search Engine Optimization.
- Forms - Advanced.
- Publishing webpages or websites-I.

(5.GV.02) Communication Skill - I

Communication Process: The magic of effective communication; Building self-esteem and overcoming fears; Concept, nature and significance of communication process; Meaning, types and models of communication; Verbal and non-verbal communication; Linguistic and non-linguistic barriers to communication and reasons behind communication gap/ miscommunication.

Structural and Functional Grammar: Sentence structure, modifiers, connecting words and verbals; phrases and clauses; Case: subjective case, possessive case; objective case; Correct usage of nouns, pronouns and antecedents, adjectives, adverbs and articles;

(5.GV.03) Graphic Design (Basic Sketching and Human Anatomy in Drawing)

Unit I:

Orientation into visual art form. The Basics of traditional 2D animation, Introduction to the skill required thereof, beginning life drawing, Use of simple shapes. How to draw sketches with the help of basic shapes Learning to draw lines, circles, ovals, scribbles, zigzag (random) patterns

etc. Background elements, trees, mountains, clouds, water bodies, meadows, perspective drawing Lights and shadows day night scenes, layers (concept and implementation) layout design and staging. An intro on how to make drawings for animation, shapes and forms, about 2D and 3D drawings, Caricaturing-fundamentals, Exaggeration, Attitude, Silhouettes, Boundary breaking exercises and warm-ups.

Unit II:

HUMAN ANATOMY: Structure of man, proportion of body parts, drawing from basic form, Line of action, balance Rhythm, turnings, twisting, drawing plane surfaces, torso, face, eyes, nose, ears, mouth, hand and feet.

FEMALE ANATOMY: Proportion and construction of female body, twisting of female body, chest, torso, face, parts of face, hands, hands in action, feet and gestures, curves, curls, rhythm and twist.

CHILD ANATOMY: Understanding child's figure, proportion and construction of child body, face, chubbiness, hand, feet and gestures.

ANIMAL ANATOMY: Animals from basic forms, understanding motion and grace of animals, turning animals to character, face, legs, tails, perspectives.

CARTOON ANATOMY: Understanding cartoon characters, drawing from basic shapes, line of action, distortion of proportion, cartoon faces, eyes, mouths, hairs, nose, hands, feet, gestures and poses.

(5.GV.04) Illustrations and Photo Editing

UNIT - I

Introduction to Adobe Illustrator: Introduction to Adobe Illustrator, work area and workspaces and tools. Opening files, importing art work, viewing art work, rulers and grids, Drawing in Illustrator, drawing lines and shapes, pencil tool, pen tool, editing drawing, tracing, symbols, colouring, applying colours, swatches, adjusting colour and colour settings.

UNIT - II

Painting with Illustrator, fills, strokes, brushes, transparency, blending, gradient, meshes and color blending. Selecting, transformation, scaling, grouping, reshaping, cutting, blending of object, creating 3D object, text and typing, special effects, filters, shadows, glow, feathering graphic styles.

UNIT - III

Photoshop and its interface, Navigation and All tools, Working with basic selections, advanced selections-1(on the basis of channels, color range, extract, filter etc), Exercises on selections, Quick Masks, Layer Mask, Vector Mask, Layers & Layer Blending Modes, Play with Photoshop, Filter Gallery, Exercises, Bring some object and try to make it in computer, Make your own cartoon character.

Color Theory, Make a perfect cropping of some images using Photoshop, Prepare a cut-out of some images using Photoshop, Place nice background for those images, Prepare nice background using gradient tool, Scan various images, Color adjustment of those images (PHOTO RETOUCHING).

UNIT – IV

Make Nature scene (winter) digital painting, Make Nature scene (summer) digital painting. Make digital painting (Use brush, pencil, smudge etc), Make something like modern art keeping in mind color combination, make a collage of Indian art and culture. Make a collage of wildlife animals, Make a portrait of celebrity (Digital painting). Convert a B&W image into color (Use variation), "Choose a theme (Music, Festivals, Sports, Dance) and Design 5-8 graphics on them.", Color Modes, Color Corrections, Advanced color correction techniques (levels, Curves, Hue, Saturation etc), Design that Ad from your own style. Design motifs tribe art, Make an animal character, "Plan a story of that character & Make its backgrounds in three/four frames", Make posters on nature/earth, Matte Painting- Composition, Creating images for the web: Exporting images from Photoshop.

(5.VP.01) Web Applications Lab

- Movie Editing Tools
- Customizing and Embedding, Multimedia Components in Web Pages.
- Web Scripting - Java Script.

(5.VP.02) Illustration and Photo-Editing-Lab

- Script breakdown
- Storyboards
- Costume acquisition
- Sets and Properties design and sourcing
- Location recce and hire
- Location permissions and legal requirements, permissions from civic authorities
- Equipment requirements and bookings
- Travel and Transport
- Catering for crew
- Hospitality for out of town shoots

Level 5 (Semester II)

(5.GV.05) Pre-Production

- Research, brainstorming & story concept creation: Intention / purpose & audience (what you intend to say & why)
- Story structure & character development: Narrative structure and character back story
- Sequence & shot analysis: Analysis and re-creation of timing and shot composition from professionally produced film/video productions
- Storyboards: Visual design (layout/composition, style, color, lighting etc.); Language of cinema (narrative structure, shot composition, spatial/directional continuity)
- Animatics / pre-viz: Timing and transitions Audio layering (music, ambient sound, narration)
- Budgeting and planning: Consideration of schedules, costs and other planning issues

(5.GV.06) Audio Editing

UNIT - I

Sonic Sound Forge: Manipulating audio: Auto trim/crop, mute, DC offset, resample, reverse, smooth/enhance, Fade in/out, insert silence, bit depth converter etc, understanding various digital audio formats like .WAV, .AIFF, .MP3, swf, WMA etc, understand audio plug-in, importing and exporting into multiple audio file formats like MP3, real audio, QuickTime formats, etc.

Event tool: move, split, slip and trim multiple events, create fades, apply ASR

(Attack/Sustain/Release). Understanding script editor window, Spectrum analysis tools, scrub tool etc, statistics tool (Max, RMS, DC offset, zero crossings), sampler tool etc, Audio editing: workflow, real time editing, event based editing, waveform volume and pan envelopes, Edit, record, encode and master digital audio, editing audio by drag and drop options, cross fading audio tracks, balancing sound levels, creating smooth fades etc.

UNIT - II

Understanding Multichannel audio recording, synchronize audio and video. Understanding regions and play lists, editing of fields, name markers, loops, and regions, Timing basis: absolute frames, measures and beats, Time and frames. Audio effects like: Equalizer, Volume, chorus, distortion, Delay/echo, pitch, bend/shift, reverb, vibrato, normalize etc Insert track markers, adding multiple tracks, adjusting track time, musical instrument file processing

(5.GV.07) Video Editing

- Adobe Premiere: Concept of non-linear editing,
- The basics of editing: Overview, Importing and Exporting: various audio, video and graphics in various formats, Edit, manipulate and arrange these elements in visual timeline, understand all Tools of toolbox for editing clips. Titling and superimposing.
- Panels: Tools panel, Project,
- Monitors: Source and program, Timeline, Audio meters,
- Misc. Tasks and functions: Titles, Transitions, speed and duration, Effects, Key frames, Types of edit, Opacity, trimming,

- Adding Special effects like: Star trek transporter effect, Blur part of an image, Ghost effect, Highlight part of an image etc.

(5.GV.08) Communication Skill-II

Communication Process:

Basic Communication Skills: Listening, Speaking, Reading and Writing Skills; Precise writing/ abstracting/ summarizing; Style of technical communication Curriculum vitae/resume writing; Innovative methods to enhance vocabulary, analogy questions.

Structural and Functional Grammar:

Agreement of verb with the subject: tense, mood, voice; Writing effective sentences; Basic sentence faults;

(5.VP.03) Audio Editing Lab

Using Editing Software – editing basics and implementation of various techniques used in non-linear editing. Mastering final edit line – audio levels, colour correction, audio mixing, mixed and un-mixed versions, importing and applying compatible graphics files. Understanding compression and its affects along with various methods.

(5.VP.04) Video Editing Lab

- Assisting Production department on shoot
- Assisting Direction department on shoot
- Assisting Art department on shoot
- Assisting Camera department on shoot
- Assisting Sound department on shoot

Level 6 (Semester I)

(6.GV.01) Principles of Animation and Techniques of Animation

UNIT - 1

Drawings with the help of basic shapes, Animal study, Human anatomy, Shading techniques, Live model study, Introduction- Importance of confidence, Difference between “looking at the drawing” and “seeing the drawing”, What is observation, Procedure- How to approach, Importance of Guideline- Line of action, Overcome the fear, Drawing for animation,

UNIT - 2

An Introduction on how to make drawings for animation, Shapes and forms, About 2d and 3d drawings, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary- breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

UNIT - 3

Drawing for Animation, Exercises and warm ups on pegging sheet, Quick Studies from real life, Sequential movement drawing, caricaturing the Action. Thumbnails, Drama and psychological effect, Motion Studies, Drawing for motion,

UNIT - 4

The Body language, Re-defining the drawings, Introduction to animation production process, Basic Principles in animation, Squash and stretch, Anticipation, Staging, Straight ahead and pose to pose, Follow through and overlapping action, Slow in and slow out, Arcs, Secondary action, Timing, Exaggeration, Solid drawing, Appeal, Mass and weight, Character acting, Volume, Line of action, Path of action, Walk cycles-animal and human.

(6.GV.02) Basic of 3-D Modelling

UNIT - I

Interface of 3DS max, Understanding the concept of four view ports, Aligning object in the each view port in X, Y, Z axis, Hot keys, User defined hot keys, Using the menus, Floating and docking. Command panel, customizing the interface, Using drag and drop feature, Introduction to different workspaces, "Geometry, Sub objects, Extruding, Welding, bridging etc, Recognizing the workspaces".

UNIT - II

Introduction to standard and extended primitives. "Introduction to creating complex objects with Standard and extended primitives", Understanding the spline tools. Introduction to polytools. Using modifier stack, navigating the modifier stack, File navigation, Introduction to Connection (Hierarchy, Group, and Link).

UNIT - III

Introduction to the 3d elevators and walk through, "Introduction to modifiers and modifier gizmos, Familiarity with Modifiers like Bend, edit poly, X form, wave, lathe symmetry etc

UNIT - IV

Advanced 3DS Max, Modelling objects with lathe, loft, extrude etc, Creating 3D objects from 2D spline shapes, Organic and inorganic modelling

(6.GV.03) Texture and Lighting

Unit I:

Introduction to texturing, working with Diffuse, Opacity and Reflection, Basics of UV unwrapping, Creating texture maps, Bump and Displacement Mapping, Introduction to Video post, Introduction to standard lights.

(6.GV.04) Communication Skills III

UNIT-I Recognizing and Understanding Communication Styles: What is Communication, Passive Communication, Aggressive Communication, Passive-Aggressive Communication, Assertive Communication, Verbal and Non Verbal Communication, Barriers and Gateways to Communication.

UNIT-II Listening Skills: Types of Listening (theory /definition), Tips for Effective Listening Academic Listening- (lecturing), Listening to Talks and Presentations, Basics of Telephone Communication Writing Skills: Standard Business letter, Report writing, Email drafting and Etiquettes, Preparing Agenda and writing minutes for meetings, Making notes on Business conversations, Effective use of SMS, Case writing and Documentation

UNIT-III Soft Skills: Empathy (Understanding of someone else point of view), Intrapersonal skills, Interpersonal skills, Negotiation skills, Cultural Aspects of Communication.

UNIT-IV Group Communication: The Basics of Group Dynamics, Group Interaction and Communication, how to Be Effective in Groups, Handling Miscommunication, Handling Disagreements and Conflicts, Constructive Criticism

(6.VP.01) Digital Animation with Flash Lab

- Data management in postproduction.
- Setting up and preparing editing rooms and sound editing rooms
- Logging of rushes
- Assisting in rough cuts
- Assist in editing line-up
- Assist in synchronizing visuals and dialogue
- Assist in recording and matching sound effects

(6.VP.02) Maya Lab

- Navigate the Maya interface
- Access your objects in the Maya scene graph
- Use the Maya polygon and NURBS modeling tools
- Shade and apply texture maps to objects inside of Maya

- Union: Region belonging to one or both polygons
- Intersection: Region belonging to both polygons
- Difference: Region belonging to first but not second
- Polygon Texturing

Level 6 (Semester II)

(6.GV.05) 3D Animation

Unit I: Body Mechanics

Students learn to use principles of traditional animation within the context of 3D animation by effectively applying them onto the character.

Part of good acting for animation is planning. The students learn to create or collect authentic visual references (both still and video) for animating body mechanics and understanding acting.

Good poses are not only essential to create believable physicality but also it helps to clearly convey the character emotion for storytelling. They learn the importance of balance and weight, checking the silhouette all the time to make clearer poses.

They learn to act out body mechanics, learn the effect of physics (gravity/friction etc.) and artistic Presentation (composition, staging, silhouette etc.)

Students learn to convey Emotion not only in the facial expression but also in the body language.

Unit II: Facial Expression and Lip Sync

Foundation of good facial expression depends upon the reference and pre-planning. Detailed expression chart and voice recording is used as a starting point for any facial animation. Students learn to internalize the dialogue and they rehearse the sounds to match the shapes. They also need to draw out key poses before starting to pose in 3D.

A good animator needs more skillset than just to be able to animate how to create lip-synch.

Students explore how to create the subtle facial expressions to suit the personality of the character and the accent style of the pre-recorded dialogue.

Unit III: Animation and the Body

Exploration of the diverse ways in which the human form takes shape in animated films, from highly photorealistic representations to stream-of-consciousness movement. Specific examples from 2D, 3D, stop-motion and hybrid work will be examined in order to shed light on the construction and animation of the body in contemporary film.

(6.GV.06) Introduction to 3 D Motion Graphics & VFX

UNIT - I

Concepts for Broadcast animation for logos, channel IDs and montages, Multi-layer compositing, Special effects, Super imposition and titling, Exporting various file formats outputs as per the end user requirements.

UNIT - II

Introduction to batch render & work group, Adding cameras & lights to a simple scene to make a complex compositing, Adding 2D back ground and elements into a 3D character layers, Creating object, material IDs for further adding special effects, Effects for digital video 2D layers and 3D layers for more effective outputs, adding particle effects into a scene.

UNIT - III

Introduction to colour character and keying, "Editing the real time video with CG based scene and merging both of them to create a final output, Exporting various file format, output as per the end user requirements.

UNIT - IV

Introduction to the batch rendering and work groups, Introduction to the concepts of editing in terms of compositing, Adding special effects in built in compositing software to make a simple shot into a perfect output.

UNIT - V

Chroma keying, Luma key, Blue screen, Key frame text & layer animation & 3D particles, Effects etc. Color correction, Introduction to 3D compositing concepts i.e. Layers and masking, Rot scoping, Rig removal, Morphing.

(6.GV.07) Introduction to Rendering

Unit I:

This unit teaches students about rendering concepts; formats and resolutions.

Unit II:

This unit teaches students the advantages of different render software such as mental ray, v-ray, render man etc.

Unit III:

This unit teaches students the benefits of layer based rendering. This process enhances the image quality without need of re-rendering the images again.

Unit IV:

The rendered layers or passes need to be composited to get the final output.

(6.GV.08) Communication Skills IV

Forms of non-verbal communication; interpreting body-language cues; Kinesics; Effective use of body language. The presentation and oral communication skill will be imparted through Group Discussion, Differences between group discussion and debate; Presentation Skills, Oral presentation and public speaking skills; The course also includes training and skill of Technology-

based Communication, power-point presentation. Activities/tasks like role playing, group discussion, public speaking, extempore presentation and interviews will be conducted on regular basis.

Writing Skills: The activities will include: Writing Task: identifying the focus, generating ideas, outlining, etc. Paragraph Structure and Linking Sub-points in a Paragraph Cohesion and unity in a paragraph, Minding Punctuation and Proofreading, Summarising, Reviewing and Aspects of Creative Writing. Activities / tasks to be conducted like paragraph writing, essay writing, writing a review of a literary text, writing a summary of a literary text, comprehension and analysis of a literary text, preparing an advertisement.

(6.VP.03) 3D Animation Lab

- Assist in laying background music tracks
- Assist in mixing and mastering video
- Assist in creating titles and subtitles and basic animation sequences
- Understand and assist in the execution of modelling and rendering in 3D animation software.

(6.VP.04) 3D Rendering Lab

Introduction to Scene, Preparing the Scene, Basic Settings for Texturing, Create & Assign Textures, Light Setup, V-Ray Rendering Settings

- Rendering with V-Ray
- V-ray light setup
- V-ray rendering settings
- HDRI Illumination
- Fine-tuning shadows
- Final render setting

Level 7 (Semester I)

(7.GV.01) Digital Compositing

- Introduction to Compositing software
- Principles of compositing
- Basic techniques
- Transparency
- Rotoscoping
- Wire Removal
- Chroma key
- Layer based compositing
- Compositing modes
- Animating layers

(7.GV.02) 3D Texturing

UNIT - I

Introduction to basic material types & Procedurals. Study of concepts: Opacity, Smoothness, Specularity, and color, Working with Maya Surface Nodes-Blinn, Phong & Lambert, Working with Transparency, Reflection & Refraction, Bump & Displacement Maps, Introduction to unwrapping, Unwrapping the maps for various 3D characters.

UNIT - II

Working with 2D and 3D Texture, Introduction to the mapping and advanced texturing techniques, Shadow maps; ray traced shadows and radiosity, Creating photo real environments and textures, Basics of Utilities-Reverse, Stencil, Condition, Sampler Information.

(7.GV.03) Basic of Accounts-I

Chapter 1:

- Define the accounting process
- Describe the role of accountants
- Explain accounting concepts and principles
- Discuss the concept of the accounting equation
- Use the accounting equation to analyze basic transactions in terms of increases and decreases
- Reporting financial information on a balance sheet

Chapter 2:

- Determine how transactions change owner's equity in an accounting equation
- Reporting a changed accounting equation on a balance sheet

Chapter 3:

- Analyze transactions using T-accounts and using debits and credits
- Use debits and credits to record increase and decreases in accounts

Chapter 4:

- Record journal entries in a 5-column journal
- Define accounting terms related to journalizing transactions
- Prove and rule a five-column journal and prove cash

Chapter 5:

- Prepare a chart of accounts and opening accounts
- Post separate amounts from a journal to a general ledger
- Post column totals from a journal to a general ledger
- Make correcting entries

Chapter 6:

- Reconcile a bank statement and record bank service charges, dishonored checks, and petty cash transactions

(7.GV.04) Computer Graphics

UNIT-I Graphics Primitives: Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices. Output Primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood fill algorithms.

UNIT-II 2-D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-III 3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT-IV 3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping

(7.VP.01) Digital Compositing Lab

- 2D animation preproduction
- 2D character design
- 2D environment and background layout

- Motion graphic sequences

(7.VP.02) 3D Texturing Lab

1. Applying Texture for inorganic polygon models- I
(Lamps, Mobile, Planet, Land with grass texture, rock, atmospheric objects system)
2. Applying Texture for organic polygon models - I (Cartoon, Semi cartoon)
3. Applying Texture for inorganic polygon models - II (Solar system, Car, Bike, Plane)
4. Applying Texture for organic polygon models - II (Human, Animal)
5. Applying Texture for organic Subdivision models - I (Cartoon, Semi cartoon)
6. Applying Texture for inorganic Subdivision models - II (Solar system, Car, Bike, Plane)
7. Applying texture for rendering final output with organic and inorganic objects

Level 7 (Semester II)

(7.GV.05) Muscle System

Unit I:

Introduction to bone system/Joints and IK handles, creating bone system and maintaining naming conventions,

Unit II:

Skinning: types, import and export of skin weights, IK and FK basics, IK and FK switch, stretchy IK and FK,

Unit III:

Introduction to Deformers: attics, wrap, cluster, riggle, wire etc. Use of deformers in rigging process.

(7.GV.06) Rigging

UNIT - I

Introduction to constraints and implementation to rigging, Maintaining proper hierarchy, grouping and creating controls, Rigging the characters, Introduction to Muscle system, Working with Muscle rigging, Introduction to automated rigging systems and methods.

UNIT - II

"Embedding small scripts in the hierarchy control system, to save time and facilitate handling", Advanced rigging, Vertex weighting techniques, Rigging solutions to Anatomical Problems, Using advanced rigging to archive natural articulation of character.

(7.GV.07) Advanced Modelling with Z- Brush

UNIT - I

Z-Brush 2 features, system requirement, Z-Brush 2 concept, working with Z-Brush 2, working with the canvas, working with layouts, working with palettes, Z-Brush 2 configuration, using start-up documents, tray modes, working with Z-Script palette and working with the preference palette.

UNIT - II

Types of tools in Z-Brush 2, modes, options and related palettes, explaining the tool palatte, working with tools, working with pixel based tools, working with gyro tool, Autodesk Maya and Autodesk 3D max settings, introduction to curves, the alpha adjust curve, the edit curve, the smoothing curve, the diffuse curve, the specular curve, the trans curve, the reflect curve, the noise curve and the intensity curve.

UNIT - III

Strokes, lighting, shadows, transformation, working with alphas, texture concepts, texture inventory, understanding the texture palette, texture mapping, seamless textures, painting textures and materials.

UNIT - IV

Creates mesh visibility, morph target, multi-resolution modelling, edge loop, different maps, explain projection master, working with Z Spheres, understanding adaptive skinning and understanding unified skinning.

UNIT - V

Sculpting, sculpting brushes, using stencils, sculpting using projection master, understanding and render palette and posing characters.

(7.GV.08) Basics of Accounts-II

Chapter 1:

- Describe and prepare the work sheet
- Plan and adjust entries on a work sheet
- Extend financial statement information on a work sheet
- Find and correct errors on a work sheet

Chapter 2:

- Describe the content and purpose of the three basic financial statements and how they are related
- Prepare financial statements directly from the work sheet with a net income and a net loss

Chapter 3:

- Journalize and post adjusting entries
- Journalize and post-closing entries and prepare a post-closing trial balance

Chapter 4:

- Describe the nature of merchandising business
- Describe and be able to journalize purchases of merchandise for cash
- Describe and be able to journalize purchases of merchandise on account and buying of supplies
- Describe and be able to journalize cash payments and other transactions

Chapter 5:

- Journalizing sales (compute sales tax) and cash receipts
- Describe the concept of subsidiary ledgers
- Journalize and post using accounts payable subsidiary ledgers
- Journalize and post using accounts receivable subsidiary ledgers

(7.VP.03) Maya Muscle Lab

Practical's based on theory to be implemented in Autodesk Maya Muscle

(7.VP.04) Rigging with Maya Lab

- 3D modelling
- 3D animation
- 3D Rigging
- Texturing and Lighting
- Rendering and compositing