



**Shri Vaishnav Vidyapeeth Vishwavidyalaya**  
**Shri Vaishnav Institute Of Information Technology**  
**B.Tech. (CSE-Artificial Intelligence)**  
**Choice Based Credit System (CBCS)-2022-26**  
**SEMESTER-VII**

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BBAI501	AECC	Human Values and Professional Ethics	60	20	20	0	0	3	0	0	3

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

\***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

### Course Educational Objectives (CEOs):

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of “right” and “good” in individual, social and professional context

### Course Outcomes (COs):

1. Help the learners to determine what action or life is best to do or live.
2. Right conduct and good life.
3. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect business.

## COURSE CONTENT

### Unit I: Human Value

1. Definition, Essence, Features and Sources
2. Sources and Classification
3. Hierarchy of Values
4. Values Across Culture

### Unit II: Morality

1. Definition, Moral Behaviour and Systems
2. Characteristics of Moral Standards
3. Values Vs Ethics Vs Morality
4. Impression Formation and Management

### Unit III: Leadership in Indian Ethical Perspective.

1. Leadership, Characteristics
2. Leadership in Business (Styles), Types of Leadership (Scriptural, Political, Business and Charismatic)
3. Leadership Behaviour, Leadership Transformation in terms of Shastras (Upanihads, Smritis and Manu-smriti).

### Unit IV: Human Behavior – Indian Thoughts

1. Business Ethics its meaning and definition
2. Types, Objectives, Sources, Relevance in Business organisations.
3. Theories of Ethics, Codes of Ethics

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### Unit V: Globalization and Ethics

1. Sources of Indian Ethos & its impact on human behavior
2. Corporate Citizenship and Social Responsibility – Concept (in Business),
3. Work Ethics and factors affecting work Ethics.

### Suggested Readings

1. Beteille, Andre (1991). **Society and Politics in India**. AthlonePress:New Jersey.
2. Chakraborty, S. K. (1999). **Values and Ethics for Organizations**. oxford university press
3. Fernando, A.C. (2009). **Business Ethics - An Indian Perspective**. India: Pearson Education: India
4. Fleddermann, Charles D. (2012). **Engineering Ethics**. New Jersey: Pearson Education / Prentice Hall.
5. Boatright, John R (2012). **Ethics and the Conduct of Business**. Pearson. Education: New Delhi.
6. Crane, Andrew and Matten, Dirk (2015). **Business Ethics**. Oxford University Press Inc:New York.
7. Murthy, C.S.V. (2016). **Business Ethics – Text and Cases**. Himalaya Publishing House Pvt. Ltd:Mumbai
8. Naagrajan, R.R (2016). **Professional Ethics and Human Values**. New Age International Publications:New Delhi.

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BTIBMA701N	DCC	Text Analytics	60	20	20	30	20	3	0	2	4

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**Course Educational Objectives (CEOs):**

1. To provide an overview of Introduction to Text Analytics.
2. To introduce the students with the base of all the text analysis concepts.
3. To teach the fundamental techniques and principles in text analytics so that their data analysis skills can be achieved.
4. To enable students to have skills that will help them to analysis structured and unstructured real-world data and introduce them to a new world of emerging technologies.

**Course Outcomes (COs):**

After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes.

The students will be able to

1. Introduction to text mining
2. An overview of text mining
3. Reading text data
4. Linguistic analysis and text mining
5. Creating a text mining concept model
6. Reviewing types and concepts in the Interactive Workbench
7. Editing linguistic resources
8. Fine-tuning resources
9. Performing Text Link Analysis
10. Clustering concepts
11. Categorization techniques
12. Creating categories
13. Managing linguistic resources
14. Using text mining models
15. The process of text mining

**Syllabus:**

**UNIT I**

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### **Introduction to text mining:**

Text mining and data mining, Text mining applications, Text Mining nodes, Identify the Text Mining modeling node, Steps in a typical text mining session, Demonstration 1: A typical text mining session and Functions Recursion

### **UNIT II**

#### **Reading text data**

File List node, Use the File List node in text mining, Demonstration 1: Using the File List node to read text from multiple files, File Viewer node, Demonstration 2: Using the File Viewer node to view documents, Web Feed node, Web Feed node - RSS format, Web Feed node – HTML format, Demonstration 3: Reading text from a Web Feed.

### **UNIT III**

#### **Linguistic analysis and text mining**

Using Identify elements in linguistic analysis, Identify Parts of Speech (PoS), Extractor component workflow, Text preprocessing, Identification of candidate terms, Identification of equivalence classes, Forcing and excluding, assign types, categorize extracted concepts, Use Libraries and Resource templates, Use Text Analysis Packages (TAPs), Linguistic resource relationships.

### **UNIT IV**

#### **Machine Categorization techniques**

Strategies for creating categories, Text Analysis Package (TAP), Demonstration 1: Using a Text Analysis Package to categorize data, import predefined categories, Demonstration 2: Importing predefined categories, from a Microsoft Excel file, automated classification automated classification methods, Linguistic categorization techniques, Additional categorization options, Demonstration 3: Automated classification

### **UNIT V**

#### **Monitoring Using text mining models.**

Demonstration 1: Explore a text mining model, Demonstration 2: Develop a model by combining categories and customer data, Demonstration 3: Score new data.

### **Text Books:**

#### **1. Tom IBM Skills Academy Content**

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**List of Practical's:**

1. Preparing for a text mining project.
2. Text mining customer opinions about portable music players.
3. Text mining data from an RSS feed.
4. Review extracted results in the Interactive Workbench.
5. Editing dictionaries.
6. Editing advanced resources.
7. Perform Text Link Analysis.
8. Categorize music player data.
9. Use text mining models.

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BTIBMA702 N	DCC	AngularJS	60	20	20	30	20	3	0	2	4

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### Course Objectives:

1. Gain a comprehensive understanding of AngularJS, a single-page application (SPA) development framework.
2. Master core AngularJS concepts like components, directives, services, and data binding.
3. Develop proficiency in building dynamic and interactive web applications using AngularJS.
4. Learn how to implement routing and handle user interactions effectively.
5. Explore best practices for testing and deploying AngularJS applications.

### Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Explain the fundamental principles and architecture of AngularJS.
2. Create well-structured AngularJS applications using components, directives, and services.
3. Implement two-way data binding to seamlessly connect models and views.
4. Utilize routing mechanisms to navigate between different views within an application.
5. Handle user interactions through events and forms.
6. Write unit and end-to-end tests for AngularJS applications.
7. Deploy AngularJS applications to production environments.

## UNIT I

**Introduction to AngularJS:** This unit explains the Overview of AngularJS, Benefits and use cases of AngularJS, AngularJS Architecture and Core Concepts, Setting up the Development Environment, Basic Directives and Data Binding, Controllers and \$scope, Expressions and Filters, Hands-on: Building a Simple AngularJS Application.

## UNIT II

**Modules and Services:** This unit consist AngularJS Modules, Dependency Injection, Services and Factories, Built-in Services (e.g., \$http, \$q), Custom Services, Promises and Async Operations, Hands-on: Creating and Using AngularJS Services.

## UNIT III

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BTIBMA702 N	DCC	AngularJS	60	20	20	30	20	3	0	2	4

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**Directives and Components, and Forms:** This unit introduces concept of directives and components, Also learn built- in directives (ngIf, ngFor, ngClass, etc.) and Custom Directives. This unit consists of Understanding Components in AngularJS, Component Lifecycle Hooks, Communication Between Components, Working with Forms in AngularJS, Two-way Data Binding, Form Validation Techniques, Custom Validation, Handling Form Submission, Dynamic Forms, Hands-on: Creating and Validating Forms in AngularJS

#### UNIT IV

**Routing, State Management, and Data Flow:** This unit introduces conceptsvAngularJS Routing, Configuring Routes, Nested Routes and Route Parameters, Resolving Data for Routes, Lazy Loading Modules, Route Guards and Security, Managing Application State in AngularJS, Services for State Management, One-way Data Flow and Flux Architecture, State Management Libraries (e.g., NgRx),

#### UNIT V

**API Integration, Testing, and Deployment:** Working with RESTful APIs, Using \$http and \$resource for API Calls, Handling API Responses, Error Handling and Retry Strategies, WebSockets and Real-time Data, Introduction to Testing in AngularJS, Unit Testing with Jasmine and Karma, Best Practices for Testing AngularJS Applications, Hands-on: Integrating an AngularJS Application with a Backend API, Writing Tests, and Deploying an AngularJS Application.

#### TEXT/REFERENCE BOOKS:

1. "AngularJS: Up and Running: Enhanced Productivity with Structured Web Apps" by Shyam Seshadri, Brad Green.
2. "Pro AngularJS" by Adam Freeman.
3. "Learning AngularJS" by Brad Dayley.
4. "AngularJS by Example" by Chandermani.
5. "Mastering Web Application Development with AngularJS" by Pawel Kozlowski, Peter Bacon Darwin.IBM Content/Books.

#### Further Suggested Readings:

1. "ng-book: The Complete Book on AngularJS" by Ari Lerner.

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2. "AngularJS Essentials" by Rodrigo Branas.
3. "Getting MEAN with Mongo, Express, Angular, and Node" by Simon Holmes.
4. "Building Single Page Applications in .NET Core 3: Jumpstart Coding with AngularJS and Bootstrap" by Michele Aponte.

### LIST OF PRACTICALS

1. Two-Way Data Binding in AngularJS Create a simple app showing real-time binding using ng-model.
2. AngularJS Interactive Calculator Uses controllers, two-way binding, dropdown operations & event handling (ng-click).
3. To-Do List Application Add, mark complete, and delete tasks using ng-repeat, ng-click, & two-way binding.
4. Registration Form with Validation Uses ng-required, ng-pattern, \$touched, \$invalid, and form validation rules.
5. AngularJS Dashboard Using Built-in Filters Shows use of filters like uppercase, lowercase, currency, number, date, orderBy, and search filtering.
6. Basic AngularJS Music Player Play local audio files using HTML5 <audio> and AngularJS controls
7. CRUD Operations (Student Management Portal) Create, Read, Update, Delete using AngularJS & arrays (ng-repeat, ng-model, controller logic).
8. AngularJS Routing Routing using ngRoute (ng-view, \$routeProvider) with pages: Home, Red, Green, Blue.
9. AngularJS Component Lifecycle Hooks Demonstrates \$onInit(), \$onChanges(), \$postLink(), \$onDestroy() with components.
10. Binding Symbols in AngularJS Components Examples of:
  - @ → text binding
  - < → one-way binding
  - & → method binding
  - (= two-way, explained)
11. Built-in AngularJS Directives Examples of:
  - ng-app
  - ng-controller

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ng-model  
 ng-bind  
 ng-repeat  
 ng-if, ng-show, ng-hide  
 ng-class  
 ng-click  
 ng-submit  
 ng-disabled  
 ng-options

- Form States (\$pristine, \$dirty, \$touched, \$valid, etc.) Real-time form state tracking using AngularJS Form Controller.

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BTCS707N	SEC	Technical presentation skill	0	0	0	0	50	0	0	2	1

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### Course Educational Objectives (CEOs):

The student will have ability to:

1. To encourage the students to study advanced engineering developments.
2. To prepare and present technical reports.
3. To prepare technical material using audiovisual materials.
4. To encourage the students to use various teaching aids such as over head projectors, PowerPoint presentation and demonstrative models.

### Course Outcomes (COs):

Upon completion of the subject, students will be able to:

1. Ability to review, prepare and present technological developments.
2. Ability to face the placement interviews.
3. Ability to effectively communicate technical material in print.
4. Ability to present technical material orally with confidence and poise.
5. Ability to present technical material using audiovisual materials.
6. Ability to communicate technical material to a variety of audiences, from members of the building and engineering trades and medical fields to government representatives and the general public.
7. Ability to work well in teams.

### GUIDELINES:

During the Presentation Session each student is expected to prepare and present a topic on engineering/technology, for duration of about 15-20 minutes. Each student is expected to present at least twice during the semester and the student is evaluated based on that. At the end of the semester, he / she can submit a report on his / her topic of presentation and marks are given based on the report.

### TEXT BOOKS:

1. The Chicago Manual of Style, 13th Edition, Prentice Hall of India 1989.
2. Gowers Ernest, "The Complete Plan in Words" Penguin, 1973.
3. Menzel D.H., Jones H.M, Boyd, LG., "Writing a Technical Paper". McGraw Hill, 1961.
4. Strunk, W., & White E.B., "The Elements of Style", 3rd Edition , McMillan, 1979.

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BTCS707N	SEC	Technical presentation skill	0	0	0	0	50	0	0	2	1

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**REFERENCES:**

1. Turbrian K.L., "A Manual for Writers of Term Papers, Thesis and dissertations" Univ of Chicago Press, 1973.
2. IEEE Transactions on "Written and Oral Communication" has many papers.

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BTCS705N	SEC	Industrial Training	0	0	0	0	50	0	0	2	1

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BTCS706N	SEC	Project	0	0	0	120	80	0	0	8	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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**Guideline and instruction for Project:-**

S.No	Particular
1.	Group formation and Submission of Project Topic (At least three(03))
2.	Guide allotment and Topic Finalization
3.	Presentation –I Contents: 1. Problem Domain 2. Literature Survey 3. Feasibility Study 4. References
4.	Synopsis Submission
5.	Presentation – II Contents: 1. SRS / URD 2. Conceptual Design
6.	Presentation – III Contents: 1. Detail Design 2. Implementation & Test Plan
7.	Project Report Submission

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**SEMESTER-VII**

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			THEORY			PRACTICAL					
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BTIBMA703N	DSE	Fundamentals of Deep Learning	60	20	20	30	20	3	0	2	4

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**Course Educational Objectives (CEOs):**

1. To understand complexity of Deep Learning algorithms and their Limitations
2. To understand modern notions in data analysis oriented computing.
3. To be capable of performing experiments in Deep Learning using real-world data.
4. To be capable of confidently applying common Deep Learning algorithms in practice and implementing their own.

**Course Outcomes (COs):**

Upon completion of the subject, students will be able to:

1. Understand the concepts of TensorFlow, its main functions, operations and the execution pipeline.
2. Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
3. Understand difference between machine learning, deep learning and artificial intelligence.
4. Design CNN and RNN architectures for classification and sequence modelling tasks.
5. Apply deep learning models in image, text, and speech domains.

**SYLLABUS**

**UNIT-I**

**7 HOURS**

Introduction to TensorFlow: Computational Graph, Key highlights, Creating Graph, Regression example, Gradient Descent, TensorBoard, Modularity. Sharing variables, Keras Perceptrons: What is Perception, XOR Gate

**UNIT-II**

**7 HOURS**

Activation Functions and Artificial Neural Networks: Sigmoid, ReLU, Hyperbolic Tanh, Softmax, Introduction, Perceptron Training Rule, Gradient Descent Rule

**UNIT-III**

**1 HOURS**

Gradient Descent and Backpropagation: Gradient Descent, Stochastic Gradient

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BTIBMA703N	DSE	Fundamentals of Deep Learning	60	20	20	30	20	3	0	2	4

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Descent. Backpropagation, Some problems in ANN, Optimization and Regularization: Overfitting and Capacity, Cross Validation, Feature Selection, Regularization, Hyperparameters

**UNIT-IV**

**12 HOURS**

Introduction to Convolutional and Recurrent Neural Networks: Introduction CNN, Kernr filter, Principles behind CNINs, Multiple Filters, CNN applications, Introduction to RNNs, Unfolded RNNs, Seq2Seq RNNs, LSTM, RNN applications

**UNIT-V**

**8HOURS**

Deep Learning applications: Image Processing, Natural Language Processing, Speech Recognition, Video Analytics.

**TEXT BOOKS:**

1. T. Goodfellow, I, Bengio, Y., and Courville, ., Deep Learning, MIT Press, 2016.

**REFERENCES:**

1. T. Bishop. C. M., Pattern Recognition and Machine Learning, Springer, 2006.

**LIST OF PRACTICALS:**

1. To print and visualize a simple feed-forward neural network structure.
2. To implement a perceptron model using NumPy and demonstrate learning of logic gates (AND, OR, NAND).
3. To build and train a Multi-Layer Perceptron (MLP) on the MNIST dataset.
4. To train a two-layer neural network on the “Two Moons” dataset and analyze activation functions.
5. To implement gradient descent from scratch for minimizing a loss function (Mean Squared Error) and observe its convergence behavior.
6. To implement forward and backward propagation in a simple neural network using NumPy and understand how weights are updated.
7. To apply gradient descent optimization on a simple mathematical function and visualize the convergence process.

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BTIBMA703N	DSE	Fundamentals of Deep Learning	60	20	20	30	20	3	0	2	4

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8. To apply Gradient Descent on a simple loss function and visualize how the parameter converges toward the minimum.
9. To implement 2D convolution and pooling operations from scratch using NumPy and understand how feature extraction works.
10. To train a neural network using Keras and apply a custom learning-rate schedule.
11. To build a Recurrent Neural Network (RNN) for next-word prediction using a small text corpus.
12. To build an LSTM model using Keras to forecast future values in a time-series dataset

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTDSE715N	DSE	Quantum Computing	60	20	20	30	20	3	0	2	4

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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### Course Educational Objectives (CEOs):

The objective of this course is to impart necessary knowledge to the learner so that he/she can develop and implement algorithm and write programs using these algorithm.

### Course Outcomes (COs):

Upon completion of the subject, students will be able to:

1. Explain the working of a Quantum Computing program, its architecture and program model
2. Develop quantum logic gate circuits
3. Develop quantum algorithm
4. Program quantum algorithm on major toolkits

## SYLLABUS

### UNIT-I

**Introduction to Quantum Computing:** Motivation for studying Quantum Computing, Major players in the industry (IBM, Microsoft, Righetti, D-Wave etc.), Origin of Quantum Computing, Overview of major concepts in Quantum Computing: Qubits and multi-qubits states, Bra-ket notation, Bloch Sphere presentation, Quantum Superposition, Quantum Entanglement.

### UNIT-II

**Math Foundation for Quantum Computing:** Matrix Algebra: basis vectors and orthogonality, inner product and Hilbert spaces, matrices and tensors, unitary operators and projectors, Dirac notation, Eigen values and Eigen vectors.

### UNIT-III

**Building Blocks for Quantum Program:** Architecture of a Quantum Computing platform, Details of q-bit system of information representation: Bloch Sphere, Multi-qubits States, Quantum superposition of qubits (valid and invalid superposition), Quantum Entanglement, Useful states from quantum algorithmic perspective e.g. Bell State, Operation on qubits: Measuring and transforming using gates, Quantum Logic gates and Circuit: Pauli, Hadamard, phase shift, controlled gates, Ising, Deutsch, swap etc, Programming model for a Quantum Computing Program: Steps performed on classical computer, Steps performed on Quantum Computer, Moving data between bits and qubits.

### UNIT-IV

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BTDSE715N	DSE	Quantum Computing	60	20	20	30	20	3	0	2	4

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**Quantum Algorithms:** Basic techniques exploited by quantum algorithms, Amplitude amplification, Quantum Fourier Transform, Phase Kick-back, Quantum Phase estimation, Quantum Walks, Major Algorithms: Shor's Algorithm, Grover's Algorithm, Deutsch's Algorithm, Deutsch -Jozsa Algorithm,

#### UNIT-V

**OSS Toolkits for implementing Quantum program:** IBM quantum experience, Microsoft Q, RigettiPyQuil (QPU/QVM)

#### TEXT BOOKS And REFERENCES:

1. Michael A. Nielsen, "Quantum Computation and Quantum Information", Cambridge University Press.
2. David McMahon, "Quantum Computing Explained", Wiley.
3. IBM Experience:  
<https://quantumexperience.ng.bluemix.net>
4. Microsoft Quantum Development Kit  
<https://www.microsoft.com/en-us/quantum/development-kit>
5. Forest SDK PyQuil:  
<https://pyquil.readthedocs.io/en/stable/>.

#### List of Practicals:

1. Implementation of Qubits.
2. Visualization of Bloch Sphere.
3. Implementation of Shor's Algorithm.
4. Implementation of Grover's Algorithm.
5. Implementation of Deutsch's Algorithm.
6. Implementation of Deutsch -Jozsa Algorithm.



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BTDSE716N	DSE	Virtual Reality	60	20	20	30	20	3	0	2	4

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### Course Educational Objectives (CEOs):

The objective of this course is to provide a detailed understanding of the concepts of Virtual Reality and its applications.

### Course Outcomes (COs):

Upon completion of the subject, students will be able to:

1. Understand geometric modelling and Virtual environment.
2. Study about Virtual Hardware and Software
3. Develop Virtual Reality applications.

## SYLLABUS

### UNIT-I

**Introduction to Virtual Reality:** Virtual Reality and Virtual Environment: Introduction, Computer graphics, Real time computer graphics, Flight Simulation, Virtual environment requirement, benefits of virtual reality, Historical development of VR, Scientific Landmark.

**3D Computer Graphics:** Introduction, The Virtual world space, positioning the virtual observer, the perspective projection, human vision, stereo perspective projection, 3D clipping, Colour theory, Simple 3D modelling, Illumination models, Reflection models, Shading algorithms, Radiosity, Hidden Surface Removal, Realism-Stereographic image.

### UNIT-II

**Geometric Modelling:** Geometric Modelling: Introduction, From 2D to 3D, 3D space curves, 3D boundary representation.

**Geometrical Transformations:** Introduction, Frames of reference, Modelling transformations, Instances, Picking, Flying, Scaling the VE, Collision detection.

**Generic VR system:** Introduction, Virtual environment, Computer environment, VR technology, Model of interaction, VR Systems.

### UNIT-III

**Virtual Environment:** Animating the Virtual Environment: Introduction, The dynamics of numbers, Linear and Nonlinear interpolation, the animation of objects, linear and non-linear translation, shape & object inbetweening, free from deformation, particle system.

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BTDS716N	DSE	Virtual Reality	60	20	20	30	20	3	0	2	4

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Physical Simulation: Introduction, Objects falling in a gravitational field, Rotating wheels, Elastic collisions, projectiles, simple pendulum, springs, Flight dynamics of an aircraft.

#### UNIT-IV

**VR Hardware and Software:** Human factors: Introduction, the eye, the ear, the somatic senses. VR Hardware: Introduction, sensor hardware, Head-coupled displays, Acoustic hardware, Integrated VR systems.

VR Software: Introduction, Modelling virtual world, Physical simulation, VR toolkits, Introduction to VRML

#### UNIT-V

**VR Applications:** Introduction, Engineering, Entertainment, Science, Training.

The Future: Virtual environment, modes of interaction

#### TEXT BOOKS And REFERENCES:

1. John Vince, “Virtual Reality Systems “, Pearson Education Asia, 2007.
2. Anand R., “Augmented and Virtual Reality”, Khanna Publishing House, Delhi.
3. Adams, “Visualizations of Virtual Reality”, Tata McGraw Hill, 2000.
4. Grigore C. Burdea, Philippe Coiffet , “Virtual Reality Technology”, Wiley Inter Science, 2nd Edition, 2006.
5. William R. Sherman, Alan B. Craig, “Understanding Virtual Reality: Interface, Application and Design”, Morgan Kaufmann, 2008.
6. [www.vresources.org](http://www.vresources.org)
7. [www.vrac.iastate.edu](http://www.vrac.iastate.edu)
8. [www.w3.org/MarkUp/VRML](http://www.w3.org/MarkUp/VRML).

#### List of Practicals:

1. Study of tools like Unity, Maya, 3DS MAX, AR toolkit, Vuforia and Blender.
2. Use the primitive objects and apply various projection types by handling camera.
3. Download objects from asset store and apply various lighting and shading effects.
4. Model three dimensional objects using various modelling techniques and apply textures over them.
5. Create three dimensional realistic scenes and develop simple virtual reality enabled mobile applications which have limited interactivity.
6. Add audio and text special effects to the developed application.

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7. Develop VR enabled applications using motion trackers and sensors incorporating full haptic interactivity.
8. Develop AR enabled applications with interactivity like E learning environment, Virtual walkthroughs and visualization of historic places.
9. Develop AR enabled simple applications like human anatomy visualization, DNA/RNA structure visualization and surgery simulation.
10. Develop simple MR enabled gaming applications.

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