

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES  
DEVI AHILYA UNIVERSITY, INDORE**

**M. Tech. (IT) 5 Years**

**III SEMESTER**

**JULY-DECEMBER 2018**

<b>Sub. Code</b>	<b>Subject Name</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
IT-311	Linear Algebra	3	1	0	4
IT-301A	French	3	1	0	4
IT-304	Digital Electronics	3	1	0	4
IT-302B	DS with C++	3	1	0	4
IT-306	Engineering Drawing	3	1	0	4
IT-308D	Digital Elex. Lab	0	0	4	2
IT-307B	DS Lab	0	0	4	2
IT-309	Comprehensive Viva	0	0	0	4
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**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE**

**M. Tech. (IT) 5 Yrs. III SEMESTER**

**IT-311: Linear Algebra**

**Aim of Course:** To introduce different algebraic Structures with special reference to linear space and its applications in geometry.

**Objectives:**

The course is designed to make students:

- Understand concepts and methods of linear algebra.
- Develop the ability to solve problems using linear algebra.
- To connect linear algebra to other fields both within and without mathematics.
- Develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to linear algebra

**Course Contents:**

**UNIT I**

Composition Table, Revision of Group Structure, Extension of Group Structure. Ring, Integral Domain and Field structure, Detailed study of field structure Various examples of field.

**UNIT II**

Introduction of the algebraic structure for Linear space, Internal and External Compositions, Linear space. Properties of Linear Space. Sub Spaces, Criteria for sub spaces, examples of Sub-Spaces, Formation of Quotient Set, Binary Composition defines in Quotient Sets, Quotient Spaces—Examples of Quotient Space.

**UNIT III**

Linear combination of vectors over  $\mathbb{R}$  and  $\mathbb{C}$ , Linearly independent and dependent set of vectors over  $\mathbb{F}$ , Concepts of Basis and Dimensions of Linear Space, Determination of Bases and Dimensions of VCF), coordinate representation of vectors over VCF).

**UNIT IV**

Linear Transformation, Isomorphism of linear spaces, properties, kernel of Linear transformation, Null space and range space, fundamental theorem of linear space, Homomorphism, Application of Linear transformation to theory of ordinary linear Differential equations. Matrix representation of linear transformation, Rank and Nullity of Linear transformation Eigen values and vectors of linear maps and matrices. Diagonalization of Matrices, Jordan Blocks and Applications, Inner Products – Inner product space. Norm of a vector in inner product space, Unit vectors. Schwartz's Inequality, Triangle inequality, angle between vectors in inner product space, orthogonal vectors Distance in an inner product space.

**UNIT V**

Orthogonalization of bases, Orthogonal basis Ortho-normal set, Orthonormalization of basis, Gram-Schmidt's process of orthonormalization of base. Quadratic forms, Reduction of quadratic form to Canonical forms. Application, Normal form concept of rank, Index and signature of normal form. Conversion of quadratic form to normal form and determination of rank, Index and signature. Classifications of curves and surface in 2 and 3 dim. Reduction and identification.

**Reference Books:**

1. Dr. H. K. Pathak , Text Book of Linear Algebra .
2. Krishnamurthy, Linear Algebra
3. Hottman & Kunze, Linear Algebra
4. Dr. K. P. Gupta, Linear Algebra

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES  
DEVI AHILYA UNIVERSITY, INDORE  
M.TECH (IT) 5 Years III SEMESTER  
IT-310 French**

**Aim of Course**

The main aim of this course is to give the students the basic knowledge of French language.

**Objectives**

- 1.To introduce students with a foreign language-French.
- 2.To make students understand vocabulary and grammar of French language.
- 3.To introduce some aspects of France ,its people and culture.
- 4.To emphasize and develop four linguistics skills.

**Course Contents:**

**Unit I:A spring in Paris**

Lesson 1:-Meeting

Lesson 2:-Sympathies

Lesson 3:-Tastes and preferences

Lesson 4:-Agreements and disagreements

Lesson 5:-Surprises

**Unit II:Adventure in Bourgogne**

Lesson 1:-Countryside house

Lesson 2:-Meals in Broussac

**Unit III Grammare**

Articles,Nouns Adjectives,Verbs,Interrogatives,Negatives,Conjugations,Present tense

**Unit IV Communication**

Introduce oneself,Invitation writing and accepting invitation,describe the person

**Unit V Vocabulary:**

Monuments,public places in Paris,professions,different types of houses,etc

**Reference Books:**

**1.Apprenons le francais 2**

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE**

**M. Tech. (IT) 5 Yrs. III SEMESTER**

**IT-304: Digital Electronics**

**Aim of Course:** To understand basic concepts of digital logic, its operations, principles and applications.

**Objectives:**

The course is designed to make students:

- Understand number systems and codes, and Boolean Algebra
- Understand TTL and CMOS circuit characteristics, followed by logic devices such as flip-flops, code converters, counters, multiplexers, and registers.

**Course Contents:**

**UNIT I**

Binary Systems and logic circuits. Decimal, Binary, Octal, Hexadecimal numbers and their inter conversions. ASCII, Gray, Excess-3, 8-4-2-1, Error detecting and BCD codes. Logic Gates. Boolean algebra. Demorgan's theorem. Binary addition and subtraction. Unsigned Binary numbers, Signed binary numbers. 2's complement representation and its arithmetic.

**UNIT II**

Circuit analysis and design.

Boolean laws and theorems. Sum of Product and Product of Sum simplification. Two, three and four variable karnaugh map. NAND and NOR implementation. Other two level implementation. Don't care conditions.

**UNIT III**

Combinational circuits.

Design procedure. Half adder, full adder, adder-subtractor circuit. Code converters. Various logic circuits. Multilevel NAND circuit. Multilevel NOR circuit.

Data Processing circuits.

Multiplexers, demultiplexers, decoders and encoders. Binary parallel adder, look ahead carry generator, magnitude comparator, ROM, PROM, PLA.

**UNIT IV**

Sequential circuit.

Flip-flops, triggering of flip-flops. Analysis of clocked sequential circuits, state reduction and assignment, flip-flop excitation tables.

**UNIT V**

Registers, counters and integrated circuits.

Design of counters, registers, shift registers. Ripple counters, synchronous counters. TTL logic families.

**Text Books:**

1. Taub H. and Schilling D, Digital Integrated Electronics
2. Ronald J. Tocci, Digital System: Principles and application

**Reference Books:**

1. M. Morris Mano, Digital Logic and Computer Design.
2. Malvino A.P. and Leach D.P, Digital Principles and Application.
3. Taub H. and Schilling D, Digital Integrated Electronics

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE**  
**M. Tech. (IT) 5 Yrs. III SEMESTER**  
**IT-302B: Data Structures with C++**

**Aim of Course:** To develop proficiency in the specification, representation, and implementation of Data Types and Data Structures.

**Objectives:**

The course is designed to make students:

- Write programs using object-oriented design principles.
- Understand data structures such as linear lists, stacks, queues. Choose the appropriate data structure and algorithm design method for a specified application.,
- Be familiar with advanced data structures such as balanced search trees, hash tables, priority queues and graphs.
- To get a good understanding of sorting and searching techniques.

**Course Contents:**

**UNIT I**

Introduction to Data Structure: Introduction to C++, Definition of data structures and abstract data types. Static and Dynamic implementations. Examples and real life applications, Data Structures: Arrays, Address calculation in a single and multi dimensional array. Sparse matrices

**UNIT II**

Stacks, Queues and Lists: Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples: Infix, postfix, prefix representation Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples: Infix, postfix, prefix representation

Applications: Mathematical expression Evaluation

Definition: Queues & Lists: Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority queues, Applications

**UNIT III**

Sorting Searching Algorithm, Hashing: Introduction, Sorting by exchange, selection, insertions, Bubble sort, Selection sort, Insertion sort, Pseudo code algorithm and their C++ implementation, Efficiency of above algorithms, Merge sort, Merging of sorted arrays, merge sort algorithms. Quick sort algorithm, Heap sort algorithm, Radix sort

**UNIT IV**

Straight Sequential Search, Array implementations, Linked List representations, Binary Search, non – recursive Algorithms, recursive Algorithms, Indexed Sequential Search, Hashing, Hash function, Collision Resolution Techniques, Hashing Applications

**UNIT V**

Trees & Graphs: Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal - preorder, post order, in order traversal, Binary Search Trees, Implementations, Threaded trees, Balanced multi way search trees, AVL Trees, and their Applications.

Definition of Undirected and Directed Graphs and Networks, The Array based

implementation of graphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Connectivity of graphs; Connected components of graphs, Weighted Graphs, Applications.

**Text Books:**

1. A. M. Tanenbaum, Langsam, Moshe J. Augentem, Data Structures using C, PHI Publ

**Reference Books:**

1. E. Balagurusamy, Object – Oriented Programming with C++, Tata Mcgraw Hill.
2. A.V. Aho, J.E. Hopcroft and T.D. Ullman, Data Structures and Algorithms, Original edition, Addison-Wesley, 1999, Low Priced Edition.
3. Ellis Horowitz & Sartaj Sahni, Fundamentals of Data structures
4. Robert Kruse, Data Structures and Program Design in C, PHI Pub.
5. Willam J. Collins, Data Structure and the Standard Template library, Tata Mcgraw Hill.

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**M. Tech. (IT) 5 Yrs. III SEMESTER**

**IT-306: Engineering Drawing**

**Aim of Course:** To equip students with basic skills required in engineering drawings, electrical circuit diagrams, and communication

**Objectives:**

The course is designed to make students:

- To impart and inculcate proper understanding of the theory of projection.
- To improve the visualization skills.
- To enable the students with various concepts like dimensioning, conventions and standards related to working drawings in order to become professionally efficient.
- To learn basics of CAD/CAM software tools.

**Course Contents:**

**UNIT I**

Introduction: Drawing & Classification of drawings, Drawing Instruments and their uses, Indian standard for drawing. Geometrical Constructions; Polygon, Circle, Technical Lettering, Dimensioning.

**UNIT II**

Engineering Scales: Introduction – Engineering Scales, Graphical scale, Representative fraction, Types of scales – Plain, Diagonal, scale of chords.

**UNIT III**

Engineering Curves: Conic Section – Ellipse, Parabola, Hyperbola, Normal and Tangent to conic sections. Cycloidal Curves – Cycloid, Epi-cycloid, Hypo-cycloid, normal & tangent to Cycloidal curves. Involute Curves – Involute of circle, polygon, normal and tangents to involute. Spirals Curves – Archimedean, Logarithmic, Tangents and Normal to spiral curves.

**UNIT IV**

Projections: Types: Parallel and non- parallel projections. Orthographic – First and Third angle Projections, convention used, Orthographic Projection of Simple solids, conversion of 3-D view to orthographic views. Isometric Projection– Simple Solids, Isometric view, Conversion of orthographic view to isometric view. Introduction to oblique projection and perspective projection.

**UNIT V**

Projection of Geometrical features: Points, Straight, lines, Planes and Solids.

Section of Solids: Sections of Prisms, Pyramids, cones and cylinders.

Development of Surfaces: Development of surfaces of Prisms, Pyramids, cones and Cylinders.

Introduction to Computer aided drawings CAD

**Reference Books:**

1. M. B. Shah & B. C. Rana , Engineering Drawing
2. N. D. Bhatt, Engineering Drawing