SCHEME OF EXAMINATION

&

DETAILED SYLLABUS

for

BACHELOR OF COMPUTER APPLICATIONS
(BCA) DEGREE

GURU GOBIND SINGH
INDRAPRASTHA UNIVERSITY
KASHMERE GATE, DELHI

w.e.f. session 2005-2006
Bachelor of Computer Applications

FIRST SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 101</td>
<td>Mathematics – I</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 103</td>
<td>Business Communication</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>BCA 105</td>
<td>Programming with C</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 107</td>
<td>Fundamentals of Information Technology</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 109</td>
<td>Basics of Physics</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA 151</td>
<td>Practical – I</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>BCA 153*</td>
<td>General Proficiency – I</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>17</strong></td>
<td><strong>16</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

*NUES
Bachelor of Computer Applications

SECOND SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 102</td>
<td>Mathematics – II</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 104</td>
<td>Business Organization &amp; Management</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>BCA 106</td>
<td>Digital Electronics</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 108</td>
<td>Data Structures using C</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 110</td>
<td>Database Management Systems</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA 152</td>
<td>Practical – II</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>BCA 154*</td>
<td>General Proficiency – II</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>17</td>
<td>16</td>
<td>27</td>
</tr>
</tbody>
</table>

*NUES
Bachelor of Computer Applications

THIRD SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 201</td>
<td>Mathematics – III</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 203</td>
<td>Computer Architecture</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 205</td>
<td>Front End Design Tools</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 207</td>
<td>Financial Accounting</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>BCA 209</td>
<td>Object Oriented Programming</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA 251</td>
<td>Practical – III</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>BCA 253*</td>
<td>General Proficiency – III</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>17</td>
<td>16</td>
<td>27</td>
</tr>
</tbody>
</table>

*NUES
Bachelor of Computer Applications

FOURTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 202</td>
<td>Mathematics – IV</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 204</td>
<td>Software Engineering</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 206</td>
<td>Java Programming &amp; Website Design</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 208</td>
<td>Operating Systems</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 210</td>
<td>Business Economics</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA 252</td>
<td>Practical – IV</td>
<td>0</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>BCA 254*</td>
<td>General Proficiency – IV</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>17</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>

*NUES
Summer Training will be held for 4 weeks after the end of fourth semester.
Viva-Voce will be conducted in fifth semester.
### Bachelor of Computer Applications

**FIFTH SEMESTER EXAMINATION**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 301</td>
<td>Computer Networks</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 303</td>
<td>.net Programming</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 305</td>
<td>Linux Environment</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>ELECTIVES (select any One)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA 307</td>
<td>E-Commerce</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 309</td>
<td>Design and Analysis of Algorithms</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 311</td>
<td>Computer network Security</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA 351</td>
<td>Practical –V</td>
<td>0</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>BCA 353*</td>
<td>Summer Project/Training</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>BCA 355</td>
<td>Minor Project</td>
<td>-</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>BCA 357**</td>
<td>Seminar</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total**  14  20  28

*Evaluation will be based on Summer Training held after fourth semester and will be conducted by the college committee only.

**NUES**
Bachelor of Computer Applications

SIXTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 302</td>
<td>Management Information Systems</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 304</td>
<td>Mobile Computing</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 306</td>
<td>Computer Graphics &amp; Multimedia Applications</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

**ELECTIVES (select any One)**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 308</td>
<td>Internet Programming</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 310</td>
<td>Knowledge Management &amp; New Economy</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>BCA 312</td>
<td>Artificial Intelligence</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

**PRACTICALS**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>L</th>
<th>T/P</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA 352</td>
<td>Practical –VI</td>
<td>0</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>BCA 354</td>
<td>Major Project</td>
<td>-</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>12</td>
<td>22</td>
<td>25</td>
</tr>
</tbody>
</table>

**Note:**

1. The total number of the credits of the BCA programme = 160.
2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 150 credits.
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT I
DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants
MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley-Hamilton Theorem (without proof)

[No. of Hrs: 11]

UNIT II
LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities

[No. of Hrs: 11]

UNIT III
DIFFERENTIATION: Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle’s Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin’s & Taylor’s), Indeterminate Forms, L’ Hospitals Rule, Maxima & Minima, Concavity, Asymptote, Singular Points, Curve Tracing, Successive Differentiation & Liebnitz Theorem.

[No. of Hrs: 11]

UNIT IV
INTEGRATION: Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of Calculus, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcendental Functions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions.
VECTOR ALGEBRA: Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and their Applications.

[No. of Hrs: 11]

Text Books:

Reference Books:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I
Concepts and Fundamentals: Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication - The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication, Formal and Informal communication, Barriers of communication
[No. of Hrs: 12]

UNIT-II
[No. of Hrs: 12]

UNIT-III
Oral Communication: Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication. Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee. Meetings: Definition, Kind of meetings, Advantages and disadvantages of meetings/committees, Planning and organization of meetings. Job Application: Types of application, Form & Content of an application, drafting the application, Preparation of resume. Project Presentations: Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation). Arts of Listening: Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening
[No. of Hrs: 10]

UNIT-IV
Business Negotiation: Definition of negotiation, Factors that can influence negotiation, what skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation).
[No. of Hrs: 10]

TEXT BOOK:
REFERENCE BOOKS:
UNIT I
C basics: C character set, Identifiers and keywords, Data types, constants, variables and arrays, declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators.

C constructs: If statement, if….else statement, if….else if….else statement, while statement, do….while statement, for statement, switch statement, nested control statement, break operator, continue operator, comma operator, goto statement.  [No. of Hrs :12]

UNIT – II
Storage Classes: automatic, external (global), static & registers.
Arrays: Arrays, pointers, array & pointer relationship, pointer arithmetic, dynamic memory allocation, pointer to arrays, array of pointers, pointers to functions, array of pointers to functions, Preprocessor directives: #include, #define, macro’s with arguments, the operators # and ##, conditional compilations, multiple file programming.  [No. of Hrs :12]

UNIT – III
Structures:Structures, unions, structure passing to functions, bit fields, file handling [text (ascii), binary].  [No. of Hrs : 10]

UNIT – IV
Standard library functions from stdio.h, stdlib.h, conio.h, ctype.h, math.h, string.h, process.h  [No. of Hrs : 10]

TEXT:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT - I
What are computers? The evolution of computers, Classification of computers.
Block Diagram: Input-output devices, Description of Computer Input Units, Other Input Methods, and Computer Output Units.
Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to construct Memories, Magnetic Hard disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives. [No. of Hrs: 10]

UNIT - II
Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software software concepts: system & application software packages.

UNIT - III
Operating System concepts, different types of operating systems, structure of operating system, DOS/UNIX/LINUX commands, working with Windows, Windows 9x/NT/XP, Data Processing, File Systems and Database Management Systems, different types of Database Management System. [No. of Hrs: 12]

UNIT – IV

TEXT:
2. Vikas Gupta, “Comdex Computer Kit”, Wiley Dreamtech, Delhi, 2004

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT - I
Law of Motion: Force and Inertia, The law of inertia or Newton’s first law of motion, Newton’s Second law of Motion, Newton’s third law of Motion Equilibrium of concurrent forces, Friction, Lubrication  
[No. of Hrs: 11]

UNIT – II
[No. of Hrs: 11]

UNIT - III
Electricity and Electromagnetism: Electric Forces, charges & Fields: Frictional electricity, properties of electric charge, conductors and insulators, coulomb’s law, electric field, lines of force.
Electrostatics: Gauss’s theorem, applications, electrostatic potential, potential energy, electrostatics of conductors, capacitors and capacitance, effect of dielectrics in capacitors.
Current Electricity: Current, voltage, resistance, ohm’s law and resistivity of materials, electrical circuits & Kirchhoff’s rule, measurement of voltages, currents and resistance  
[No. of Hrs: 11]

UNIT – IV
Thermal and Chemical effects of current: Heating effects, Thermo Electricity, Chemical effects, Magnetic effects of currents, Oersted’s discovery, Magnetic field due to current forces on current and the lorentz force. Ampere’s circulate law, Solenoid, Electromagnetic Induction: Faraday’s experiments, Faradays Law, Lenz’s Law and conservation of energy, discussion of Faraday’s Law, Electromagnetic induction and Lorentz force, Semiconductors and their property.  
[No. of Hrs: 11]

TEXT BOOK:

REFERENCE BOOKS:
1. Kumar Mittal, “Physics, Part – I”, Published by Nageen Publications, Meerut.
2. Kumar Mittal, “Physics, Part - II”, Published, By Nageen Publications, Meerut.
Practical will be based on following Papers:

1. Programming with C
2. Fundamentals of Information Technology
*Non University Examination Scheme (NUES)

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.
UNIT-I
SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.


UNIT-II

UNIT-III
FUNCTIONS OF SEVERAL VARIABLES: Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of 2 Variables, Euler’s Theorem.


UNIT-IV
MULTIPLE INTEGRATION: Double Integral in Cartesian and Polar Coordinates to find Area, Change of Order of Integration, Triple Integral to Find Volume of Simple Shapes in Cartesian Coordinates.

TEXT BOOKS:

REFERENCE BOOKS:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT I
Business – Meaning and Contents, Business as a system, Business and Legal and Economic Environment, Forms of Business Organization (meaning, merits & demerits).

UNIT II
Organizational Behavior- Need of Understanding human behavior in organizations, Challenges and opportunities for OB, Contributing disciplines to the field of OB, Conceptual Models of OB.

UNIT III
Managing Finance- Concept of Fixed and Working Capital, Main Sources of Finance, Accounting: Meaning, Users, Budgeting- Meaning, Type of Budgets.

UNIT IV
Managing Production- Basic Concepts, Objectives, Elements of Productions, Planning and Control.
Managing Sales and Marketing- Basic Concepts of marketing, Sales Promotions (including Salesmanship)

TEXT BOOKS:

REFERENCE BOOKS:
UNIT-I
Boolean Algebra

UNIT-II
Arithmetic Circuits
Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and dibvider. Combinational Circuits
Multiplexers, De-Multiplexers, decoders, encoders, Design of code converters. [No. of Hrs: 11]

UNIT-III
Flip-flops
S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop, Realisation of one flip-flop using other flip-flop.
Shift Registers

UNIT-IV
Counters
Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter.
Memory Devices - RAM, ROM, PAL & PLA [No. of Hrs: 11]

TEXT BOOKS

REFERENCES:
2. W.Gothman, “Digital electronics”, PHI.
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I
Arrays: Representation of single and multidimensional arrays; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices
Stacks and Queues: Introduction and primitive operations on stack; Stack application: Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion from infix to postfix. Introduction and primitive operation on queues, D-queues and priority queues.

[No. of Hrs: 13]

UNIT-II
Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching; Two way lists and Use of headers
Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion;

[No. of Hrs: 13]

UNIT-III
Multilevel indexing and B-Trees: Introduction: The invention of the B-tree; Statement of the problem; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; B-trees: working up from the bottom; Example for creating a B-tree.

[No. of Hrs: 10]

UNIT-IV
Sorting Techniques: Insertion sort, selection sort, merge sort, heap sort.
Searching Techniques: linear search, binary search and hashing

[No. of Hrs: 08]

TEXT:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Introduction: Characteristics of database approach, data models, DBMS architecture and data independence.

E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub Classes:, Super classes, inheritance, specialization and generalization,  

[No. of Hrs.: 12]

UNIT – II
File Organization: Indexed sequential access files, implementation using B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.  

[No. of Hrs.: 10]

UNIT – III
Relational Data Model: Relational model concepts, relational constraints, relational algebra.
SQL: SQL queries, programming using SQL
EER and ER to relational Mapping: Data base design using EER to relational language.  

[No. of Hrs.: 10]

UNIT – IV
Data Normalization: Functional dependencies, Normal form up to 3rd normal form.
Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization.
Recovery Techniques, Database Security  

[No. of Hrs.: 12]

TEXT BOOKS:

REFERENCE BOOKS:
Practical will be based on following Papers:

1. Data Structure with C
2. Database Management System
*Non University Examination Scheme (NUES)*

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.
INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I

COMPLEX VARIABLES: Complex Number System, Algebra of Complex Numbers, Polar Form, Powers and Roots, Functions of Complex Variables, Elementary Functions, General Power of Functions, Inverse Trigonometric and Hyperbolic Functions.

SEQUENCE, SERIES AND CONVERGENCE: Sequence, Finite and Infinite Sequences, Monotonic Sequence, Bounded Sequence, Limit of a Sequence, Convergence of a Sequence, Series, Partial Sums, Convergent Series, Theorems on Convergence of Series, Leibnitz Test, Comparison Test, Ratio Test, Cauchy’s Root Test, Convergence of Binomial and Logarithmic Series, Raabe’s Test, Logarithmic Test, Cauchy’s Integral Test (without proof)

[No. of Hrs: 13]

UNIT II

VECTOR CALCULUS: Differentiation of Vectors, Scalar and Vector Fields, Gradient, Directional Derivatives, Divergence and Curl and their Physical Meaning, Line Integral and Green’s Theorem.

[No. of Hrs: 9]

UNIT III


[No. of Hrs: 9]

UNIT IV


[No. of Hrs: 13]

TEXT BOOKS:


REFERENCE BOOKS:

UNIT-I
Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operatrons, Arithmetic logic shift unit

Basic Computer Organizations and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, [No. of Hrs: 11]

UNIT-II
Basic Computer Organizations and Design: Instruction Cycle, Memory-Reference Instructions, Register reference instructions, Input - Output Instructions, Design of Accumulator Logic Shift Unit

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, [No. of Hrs: 11]

UNIT-III
Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members.

Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA) [No. of Hrs: 11]

UNIT-IV
Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware [No. of Hrs: 11]

TEXT BOOKS :

REFERENCE BOOKS:
UNIT-I
Visual Basic: Variable Names, Data Types, Assignment, If-then, If-then-else, if then-elseif-else, expression, print statement, arrays, variable declaration, built-in & User defined types, Subroutine and functions, Boolean Operators, Arithmetic Operator, For- next, do loop, while-wend, procedure/Public, Private and Static & Dim Statement.  

UNIT-II
Structure of VB program, Forms & built in controls, Properties and events, Code Module, Scale Modes, Printer Object (Printing text, setting Fonts, graphics), Common dialog Boxes, picture controls, image-controls, send keys, MS-Common Controls, Error Handling, Classes, Control Arrays, MDI, SDI.
File Handling – Text and Binary Files, Files System Orbit Object.  

UNIT-III
Database Interface: Review of ANSI SQL, ODBC, Pass through ODBC, DAO, MS-Jet Engine, DB-Engine, Workspaces, Databases, recordsets, Data bound controls, ActiveX controls, ADO, Active X Data controls, RDO 
Data view Window, Data Environment Designer, Crystal Report and Data Report Utility 
Using Visual Basic (VB) for Transaction Management, Concurrency Control, Interfacing with RDBMS, Backend Stored procedure Usage.  

UNIT-IV

TEXT:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India. [No. of Hrs.: 08]

UNIT – II

UNIT – III
Financial statement analysis; Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break-even analysis. [No. of Hrs.: 08]

UNIT – IV
Inventory valuation: Objectives, Introduction to FIFO, LIFO & Weighted Average method of inventory valuation, Valuation of inventory on balance sheet date, inventory accounting and control, Introduction to stocks & shares, Concept of cost of capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt. Theory of working capital: Nature and concepts [No. of Hrs.: 09]

TEXT BOOKS:

REFERENCES BOOKS:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition).
Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete operators.
[No. of Hrs: 12]

UNIT – II
Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass/abstract classes.
[No. of Hrs. 12]

UNIT – III
Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric polymorphism,
[No. of Hrs: 10]

UNIT – IV
Generic function – template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.
Files and Exception Handling: Persiant objects, Streams and files, Namespaces, Exception handling, Generic Classes
[No. of Hrs: 10]

TEXT:

REFERENCE:
Practicals will be based on following Papers:

1. Front End Design Tools
2. Object Oriented Programming
Non University Examination Scheme (NUES)

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.
UNIT-I  
STATISTICS
COMBINATORICS: Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem.
PROBABILITY: Definition of Probability, Conditional Probability, Baye’s Theorem

[No. of Hrs: 10]

UNIT II  
PROBABILITY DISTRIBUTIONS: Review of Mean & Standard Deviation, Mathematical Expectation, Moments, Moment Generating Functions, Binomial, Poisson and Normal Distributions.

[No. of Hrs: 10]

UNIT III  


[No. of Hrs: 12]

UNIT IV  
SOLUTION OF LINEAR SIMULTANEOUS EQUATIONS: Gaussian Elimination Method with and without Row Interchange: LU Decomposition: Gauss - Jacobi and Gauss-Seidel Method; Gauss – Jordan Method and to find Inverse of a Matrix by this Method.

NUMERICAL DIFFERENTIATION- First and Second Order Derivatives at Tabular and Non-Tabular Points, Numerical Integration, Trapezoidal Rule, Simpson’s 1/3 Rule: Error in Each Formula (without proof).

[No. of Hrs: 12]

TEXT BOOKS:
UNIT – I
Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models
Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.  

[No. of Hrs.: 12]

UNIT – II

[No. of Hrs.: 10]

UNIT – III
Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design
Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics,  

[No. of Hrs.: 10]

UNIT – IV

[No. of Hrs.: 12]

TEXT:

REFERENCE:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I
Java Programming: Data types, control structured, arrays, strings, and vector, classes (inheritance, packages, exception handling), multithreaded programming,   [No. of Hrs.: 12]

UNIT – II
Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar), layout manager, string handling (only main functions),  [No. of Hrs.: 10]

UNIT – III
Networking (datagram socket and TCP/IP based server socket), event handling, Drivers in java, JDBC, ODBC connectivity (database connectivity)  [No. of Hrs.: 12]

UNIT - IV
HTML: use of commenting, headers, text styling, images, formatting text with <FONT>, special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags, <FRAMESET> tags, file formats including image formats. [No. of Hrs.: 10]

TEXT BOOKS:

REFERENCE BOOKS: -
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation
Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations

UNIT – II
Processes: Process Concept, Process Scheduling, Operation on Processes
CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling,
Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

UNIT – III
Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock
Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability

UNIT – IV

TEXT:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT I

The Production Process: Output decisions – Revenues, Costs and Profit Maximisation
Laws of Returns & Returns to Scale; Economies and Diseconomies of Scale.  
[No. of Hrs.: 12]

UNIT II
[No. of Hrs.: 12]

UNIT III
[No. of Hrs.: 10]

UNIT IV
[No. of Hrs.: 10]

TEXT BOOKS:
Practical will be based on following Paper:
  1. Java Programming & Website Design
*Non University Examination Scheme (NUES)

There will not be any external examination of the university. The performance of the candidates should continuously be evaluated by an internal committee. The committee may conduct viva-voce at the end for the award of the marks.
UNIT – I
Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, transmission mode, and categories of networks.
Digital Transmission: Interfaces and Modems: DTE-DCE Interface, modems, cable modems.
Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon Capacity, comparison of media.

[No. of Hrs.: 12]

UNIT – II
Telephony: Multiplexing, error detection and correction: Many to one, one to many, WDM, TDM, FDM, circuit switching, packet switching and message switching.
Data Link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.
Point to point protocols: Transmission states, PPP layers, LCP, Authentication, NCP.
ISDN: Services, historical outline, subscriber’s access, ISDN, Layers, and broadband ISDN.

[No. of Hrs.: 12]

UNIT – III

[No. of Hrs.: 10]

UNIT – IV
Transport and upper layers in OSI Model: Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer.

[No. of Hrs.: 10]

TEXT BOOKS:

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
.Net architecture, Namespheres, Assemblies, object oriented features, memory management, interoperation with IOM, transaction in .NET, Structured exception handling, code access security.

UNIT – II
VB.NET
Similarities & differences with Visual Basic, windows focus, ADO.NET, working with databases, object oriented features.

UNIT – III
ASP.NET
Similarities & difference with ASP, Architecture, web-form, development, XML, databases interface.

UNIT – IV
C++ .NET
Similarities & differences with C/C++, Creating components, window four, menus, validation, database interface.

TEXT:
2. M. Reynolds et. al., “.NET Enterprise”, Wrox/SPD, 2002

REFERENCES:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT-I
UNIX & LINUX:- Overview of UNIX and LINUX Architectures editors and commands, shell scripts, system administration.
LINUX Internals:
Introduction: - Data structures in LINUX kernel, process management, systems calls
Memory Management:- Architecture independent memory model, virtual address space for a process, block devices, caching, paging under LINUX. [No. of Hrs.: 11]

UNIT-II
Inter Process Communication: - Synchronization in kernel, communication via files, pipes, ptrace, system V IPC, and sockets. [No. of Hrs.: 11]

UNIT-III
LINUX File System: - Representation of file system in the kernel, Proc and Ext2 file system.
Modules: - Modules in LINUX, debugging. [No. of Hrs.: 11]

UNIT-IV
Multiprocessing: - Multiprocessing, symmetric multiprocessing. Changes with respect to kernel initialization, spooling, message exchange between processes, interrupt handling [No. of Hrs.: 11]

TEXT BOOKS:

REFERENCES:
UNIT-I


UNIT – II


UNIT – III


UNIT – IV

Economics, Global & Other Issues in EC: Competition in Marketspace, Some Issues in Digital Economy and Success Factors, Impacts on Industry Structure, Intermediaries, and
Others, virtual Communities, Global Electronic Commerce, Electronic Commerce in Small companies, Research in EC, The Future of EC

[No. of Hrs.: 10]

TEXT BOOKS:
INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Mathematical Preliminaries: Review of growth functions, Solution of difference equations. Sorting and Order Statistics Merge sort, Heap sort, Quick sort, radix sort, bucket sort, median and order statistics.  

[No. of Hrs.: 11]

UNIT – II
Advanced Data Structures Review of binary search trees, dynamic set operation, red black trees, binomial heap. Dynamic Programming Matrix multiplications, longest common subsequence and optimal polygon triangulation problems.  

[No. of Hrs.: 11]

UNIT – III

[No. of Hrs.: 11]

UNIT – IV
String Matching, Naïve String Matching, Rabin karp and KMP algorithms.  

[No. of Hrs.: 11]

TEXT:

REFERENCES:
UNIT - I
Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

UNIT – II
Net Work Security :

UNIT – III


UNIT – IV


TEXT BOOKS:
Practicals will be based on following Papers:

1. .net Programming
2. Linux Environment
The viva will be conducted based on summer training of four weeks after the end of fourth semester.
Evaluation will be based on Summer Training held after fourth semester and will be conducted by the college committee only.
*Non University Examination Scheme (NUES)

An internal committee of the college will evaluate student & award the marks.
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
The meaning and role of MIS: What is MIS?. Decision support systems, systems approach, the systems view of business, MIS Organization within the company.

Management Organizational theory and the systems approach:
Development of organization theory, management and organizational behavior, management, information, and the systems approach.  

[No. of Hrs.: 11]

UNIT – II
Information Systems for decision making: Evolution of an information system, Basic Information Systems, decision making and MIS, MIS as a technique for making programmed decisions, decision assisting information systems.

Strategic and project planning for MIS: General business planning, appropriate MIS response, MIS planning – general, MIS planning – details.  

[No. of Hrs.: 11]

UNIT – III
Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report.

[No. of Hrs.: 10]

UNIT – IV
Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train and operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.

Pitfalls in MIS development: Fundamental weaknesses, soft spots in planning, design problems, implementation: The TAR PIT.  

[No. of Hrs.: 12]

Text book:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT 1:
Introducing the Mobile Internet: The Mobile Internet is here, The Rise of Mobile data. Key Services for the mobile Internet, Business opportunities. [No. of Hrs.:10]

UNIT 2:

UNIT 3:

UNIT 4:

TEXT BOOK:
UNIT – I

Graphics Hardware
Hardcopy Technologies, Display Technologies, Raster-Scan Display Systems, The Video Controller, Random-Scan Display Processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc.

Clipping
Southland-Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm

[No. of Hrs.: 12]

UNIT – II
Geometrical Transformations

[No. of Hrs.: 10]

UNIT – III
Representing Curves & Surfaces
Polygon Meshes, Parametric Cubic Curves, Quadric Surfaces.

Solid Modeling

[No. of Hrs.: 10]

UNIT – IV
Introductory Concepts: Multimedia, Defintion, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills and training, Training Opportunities in Multimedia, Motivation for Multimedia usage

[No. of Hrs.: 12]

TEXT BOOKS:

REFERENCES BOOKS:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Microsoft Visual InterDev: Web servers, Creating a project, Use of project Explorer, Toolbox window, Site design
Java Script., Data types, Control structures, Functions, Arrays, and Objects. [No. of Hrs.: 11]

UNIT – II
DHTML: CSS, Object Model collection, event model, filter and transitions, data binding with tabular data control.
VB script and its utility functions. [No. of Hrs.: 10]

UNIT – III
Web servers- PWS set up, publishing information, and publishing Internet information server.
Database: registering ODBC, database, ADO (active X data objects)
ASP-Active server pages, client side and server side programming. [No. of Hrs.: 12]

UNIT – IV
XML-Structuring data, DTD’s using XML with HTML and CSS, XML parsers.
Servlets. [No. of Hrs.: 11]

TEXT BOOKS:
INSTRUCTIONS TO PAPER SETTERS:
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

UNIT – I
Business Intelligence and Business Decisions; Modelling Decision Processes; Decision support systems; Group decision support and Groupware Technologies. [No. of Hrs.: 11]

UNIT – II
Executive Information and support Systems; Business Expert System and AI, OLTO & OLAP; Data Warehousing; Data Marts..., Data Warehouse architecture; Tools for data warehousing. [No. of Hrs.: 11]

UNIT – III
Multi-dimensional analysis; Data mining and knowledge discovery; Data mining and Techniques; Data Mining of Advance Databases. [No. of Hrs.: 11]

UNIT – IV
Knowledge Management Systems: Concept and Structure KM systems, techniques of knowledge management appreciation & limitation. [No. of Hrs.: 11]

TEXT BOOKS:
1. Decision support system, EIS, 2000
3. Han, Jiawei, Kamber, Michelinal, “Data Mining Concepts & Techniques”, Harcourt India, 2001
UNIT - I
Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.
Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem
Heuristic search techniques: Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction [No. of Hrs.: 11]

UNIT - II
Knowledge representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation
Using Predicate Logic: Representing Simple Facts in logic, Representing instances and isa relationship, Computable function and predicate. [No. of Hrs.: 12]

UNIT - III
Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing
Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning [No. of Hrs.: 11]

UNIT - IV
LISP and other AI Programming Language [No. of Hrs.: 10]

Text Book:

Reference:
1. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999
Practical will be based on following Paper:
   1. Computer Graphics & Multimedia Applications
   2. Electives (if required)
Evaluation will be based on Summer Training held after fourth semester and will be conducted by the college committee only.