



RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

SCHEME

First Semester

S.No.	Subject Code	Subject Name	Marks Distribution				
			Internal	External		Total	
			Max	Max	Min	Max	Min
1	UCS101	Technical English - I	30	70	21	100	35
2	UCS 102	Applied Mathematics - I	30	70	21	100	35
3	UCS 103	Digital Principles	30	70	21	100	35
4	UCS 104	Computer Concepts & Problem Solving	30	70	21	100	35
5	UCS 105	Programming in C	30	70	21	100	35
Practical							
Total							
				Max		Min	
1	UCS 153	Digital Lab		50		25	
2	UCS 154	Computer Concepts and Problem Solving Lab		50		25	
3	UCS 155	C Programming Lab		50		25	



RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

First Semester

Choice Based Credit System

MCA Year 1 Semester 1						
S.No.	Subject Code	SUBJECT NAME	PERIODS			Credit
			L	T	P	
1	UCS101	Technical English - I	3	0	0	3
2	UCS 102	Applied Mathematics - I	3	0	0	3
3	UCS 103	Digital Principles	3	0	0	3
4	UCS 104	Computer Concepts & Problem Solving	3	1	0	4
5	UCS 105	Programming in C	3	1	0	4
Practicals						
1	UCS 153	Digital Lab			2	1
2	UCS 154	Computer Concepts and Problem Solving Lab			2	1
3	UCS 155	C Programming Lab			2	1
Total					8	20



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Technical English - I	UCS101

UNIT I

ENGLISH TODAY -Modern English: Varieties of discourse – regional variations – accent and dialects – social variations – occupational varieties and scientific English – medium and attitude ; speaking and writing ; formal and informal style – language change – new ways of studying English.

UNIT II

EXTENDING VOCABULARY : STRUCTURAL AND CONTENT Principles of word formation; abbreviations and acronyms; foreign words and phrases; idioms and phrases – everyday computer – related words; scientific and technical terms.

UNIT III

GRAMMAR : Referring to people and things with the help of noun phrases – describing people and things with the help of determiners – adjectives and modifiers – making a message – varying the message: negation question exclamation inversion – expressing words referring to time, Place and manner – reporting what people say or think – combining messages: coordination and subordination – making text – the structure of information.

UNIT IV

RECEPTIVE SKILL 1 – LISTENING : Developing guided note taking from a lecture, recognizing and using descriptive words and phrases, completing information in a table, practicing dictation and checking spelling, developing accuracy in listening, imitating standard spoken English through native speakers' talk and presentation, listening for general and specific information, listening to news in the media and relating information to issues and locales around the world.

UNIT V

RECEPTIVE SKILL 2 – READING : Predicting the content – skimming the text for gist – identifying the topic sentences – guessing the meaning of words from contexts – scanning for specific information – transfer of information – cloze reading.

REFERENCE BOOKS :

1. Adrian Doff & Christopher Jones, “Language in use – intermediate”, Cambridge University Press, 2003. 2. Gail Ellis and Barbara Sinclair, “Learning to learn English: A course in learner training”, Cambridge University Press, 1989.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Applied Mathematics - I	UCS102

UNIT I

COMPLEX NUMBERS - Expansion of $\sin n\theta$ $\cos n\theta$ in terms of $\sin \theta$ and $\cos \theta$, Expansion of $\sin^n \theta$; $\cos^n \theta$ in terms of sines and cosines of multiples of θ , hyperbolic functions. Inverse hyperbolic functions

UNIT II

MATRICES :Rank of matrix - consistency and inconsistency of a system of linear equations – Eigen values and Eigen vectors – Properties - Cayley Hamilton theorem – Reduction of Quadratic form to Canonical form by Orthogonal reduction.

UNIT III

DEFINITE INTEGRALS : Reduction formula for integral of $\sin x$, $\cos x$, $\tan x$ – Definite integrals –Properties – Area of Cartesian Curves -- volumes of Revolution.

UNIT IV

ORDINARY DIFFERENTIAL EQUATIONS : Solution of second order with constant coefficients and Variable coefficients - complimentary function – particular integrals – simultaneous linear equations with constant coefficients of first order.

UNIT V

APPLICATION OF DIFFERENTIATION :Curvature of a curve – Radius of a curvature in Cartesian form - Centre of curvature – Circle of curvature – Evolutes and Envelopes.

REFERENCE BOOKS :

1. Veerarajan.T., “ Engineering Mathematics “, TMH Pub. Co.Ltd.,New Delhi 1999.
2. Kandasamy.P., Thilagavathy.K and Gunaythy.K – “Engineering Mathematics, Volume – I”. S.Chand & Co., New Delhi, 2001.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Digital Principles	UCS103

UNIT I

Binary Systems : Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic Boolean Algebra and Logic Gates : Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates.

UNIT II

Minimization: K-Map Method – Table Method, POS - SOP, Don't Care Conditions, NAND, NOR Implementation, Introduction to HDL. Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT III

Synchronous Sequential Logic: Sequential Circuits - Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment Design Procedure.

UNIT IV

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

UNIT V

Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and Flow Tables, Race – Free State Assignment Hazards, Design Example.

REFERENCE BOOKS :

1. M.Morris Mano, “Digital Design”, 3rd edition, Pearson Education, Delhi, 2007.
2. Donald P Leech, Albert Paul Malvino and Goutam Saha, “Digital Principles and Applications”, Tata Mc Graw Hill, 2007.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Computer Concepts & Problem Solving	UCS104

UNIT I

FUNDAMENTALS OF COMPUTERS :Evolution of Computers – Inputs/Outputs – Alternative Methods of Input – Organization of Modern Digital Computers – Operating System – Multitasking OS – Graphical User Interface.

UNIT II

WORD PROCESSING :Word Processing Programs and Their Uses – Word Processor's Interface – Editing Text – Formatting Text –Macro- Special Features of Word – Desktop Publishing Service – Converting doc into www pages

UNIT III

SPREADSHEET SOFTWARE :Spreadsheet Programs – applications – Spreadsheet package features, attributes - structure, label, data, importing data, formula, functions – data handling – Managing workbooks.

UNIT IV

INTRODUCTION TO COMPUTER PROBLEM SOLVING :Introduction – Problem Solving aspects-Top-Down Design-Implementation of Algorithms – Program Verification-Efficiency of Algorithms-Analysis of Algorithm-fundamental algorithmfactorial computation-generation of Fibonacci sequence.

UNIT V

FACTORING AND ARRAY TECHNIQUES : Factoring Methods-finding the square root of a number-generating prime numbers- Array techniques-array order reversal-Finding the maximum number in a set- Removal of duplicates from an ordered Array-finding the kth smallest element.

REFERENCE BOOKS:

1. Peter Norton, "Introduction to Computers", 4th Edition, TMH Ltd, New Delhi, 2001.
2. R.G. Dromey, "How to solve it by Computers", Pearson Publishers, New Delhi, 2007



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Programming in C	UCS105

UNIT I

INTRODUCTION TO C LANGUAGE :Overview of ‘C’ language – Constants, Variables and Data Types – Operators, Expressions and Assignment statements – Managing Input/Output Operations – Formatted I/O – Decision Making - Branching – IF, Nested IF – Switch – go to - Looping- While, do, for statements.

UNIT II

ARRAYS AND FUNCTIONS : Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion.

UNIT III

STRUCTURES AND UNIONS :Basics of Structures-Declaring a Structure – Array of Structures –Passing Structures elements to Functions- Passing entire Structure to Function – Structures within Structures - Union – Union of Structures – Enumerated Data Types – type of Statement.

UNIT IV

POINTERS: Pointers – Declaration, Accessing a variable, dynamic memory allocation, Pointers versus Arrays, Array of pointers, Pointers to functions and structure Pointers.

UNIT V

FILE MANAGEMENT :File Management in C – Data hierarchy- Files and Streams – Sequential access file- Random access file - Preprocessors.

REFERENCE BOOKS :

1. V.Rajaraman “Computer Programming in C” PHI, New Delhi, 2001

2. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
3. Yashavant P. Kanetkar " Pointers In C" , BPB Publications, New Delhi, 2002
4. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004
5. Deitel and Deitel " C How to Program ", Addison Wesley , 2001



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Digital Lab	UCS153

1. Binary and BCD counter
2. 2. Verification of NAND, NOR, XOR, AND, OR Gate Logic
3. Parity Generator
4. Multiplexer / Demultiplexers
5. Adder / Subtractor
6. Code Converters
7. Up / Down 4 bit Binary Counter
8. Up / Down 4 bit Decimal Counter
9. Shift Register 10. Ring Count



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Computer concepts and problem solving Lab	UCS154

1. Word Processing
2. Spreadsheet
3. Power Point
4. Factorial
5. Fibonacci series
6. Prime Generation
7. Removal of duplicates from an ordered Array



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

First Semester

Branch	Subject Title	Subject Code
Bsc(CS)	C Programming Lab	UCS155

Implementation of

1. Input / output function
2. Control Functions
3. Functions
4. Arrays
5. Pointers
6. Structures and Unions
7. Files
8. Roots of a quadratic equation
9. Measures of location
10. Matrix Operations
11. Evaluation of trigonometric functions
12. Pay roll problems
13. String operations like substring
14. Concatenation

15. Finding a string from a given paragraph,

16. Finding the number of words in a paragraph.



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Second Semester

S.No.	Subject Code	Subject Name	Marks Distribution				
			Internal	External		Total	
			Max	Max	Min	Max	Min
1	UCS201	Technical English-II	30	70	21	100	35
2	UCS 202	Applied Mathematics-II	30	70	21	100	35
3	UCS 203	Object oriented programming	30	70	21	100	35
4	UCS 204	Basics of Electrical Engineering	30	70	21	100	35
5	UCS 205	Data Structures	30	70	21	100	35
6	UCS 206	Computer Architecture	30	70	21	100	35
Practical							
Total							
				Max		Min	
1	UCS 253	Object oriented programming Lab- I		50		25	
2	UCS 255	Data Structures Lab		50		25	



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Second Semester

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MCA Year 1 Semester 1						
S.No.	Subject Code	SUBJECT NAME	PERIODS			Credit
			L	T	P	
1	UCS201	Technical English-II	3	0	0	3
2	UCS 202	Applied Mathematics-II	3	0	0	3
3	UCS 203	Object oriented programming	3	0	0	3
4	UCS 204	Basics of Electrical Engineering	3	0	0	3
5	UCS 205	Data Structures	3	0	0	3
6	UCS 206	Computer Architecture	3	0	0	3
Practicals						
1	UCS 253	Object oriented programming Lab - I			2	1
2	UCS 255	Data Structures Lab			2	1
Total					8	20



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Technical English-II	UCS201

UNIT I

ENGLISH TODAY :British and American Words – Communicating across cultures - Dealing with Discrimination – non verbal communication – values, beliefs & practices, Body language, The importance of Listening, Speaking and Interpersonal communication – purpose of Messages in Organization.

UNIT II

GRAMMAR (FOCUS ON LANGUAGE) :Identifying the lexical and contextual meaning of words – expanding nominal compounds – framing of questions (‘Wh’ pattern, yes/no questions, tag questions) Subject – verb agreement, use of articles, preposition and conditionals – impersonal passive – error detection and punctuation.

UNIT III

RECEPTIVE SKILLS 1 & 2 – LISTENING AND READING :Gap filling activity while listening - intensive listening – listening to a discourse and filling up gaps in a worksheet – comprehension tasks based on listening. Reading the gist to identify the topic sentence – its role – sequencing of sentences – transcoding diagrams – understanding discourse coherence and cohesion.

UNIT IV

PRODUCTIVE SKILL 1 – SPEAKING : Making Oral presentations – planning, kinds of presentation – adapting your ideas to audience, planning visual and other device to involve the audience – conducting language games to enrich spoken skills – facing interviews and negotiating benefits.

UNIT V

PRODUCTIVE SKILL 2 – WRITING :One sentence definition of technical terms – descriptions, paragraph writing, process description, check list, job application & resume, business letters (Calling for quotation, placing orders, enquiry etc) – Instruction and recommendation.

REFERENCE BOOKS :

1. Kitty O Locker, “Business Communication – Building critical Skills”, Mc-Graw Hill, Third Edition 2007
2. Bridha Prabhakar, G. Subramanian, “Technical English for Engineering Students”, Gems Publications, 2006.
3. Aysha Viswamohan, “English for Technical Communication”, Tata McGraw Hill, 2007



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Applied Mathematics-II	UCS202

UNIT I

MULTIPLE INTEGRALS : Double integration- Cartesian and polar co-ordinates- Change of order of integration- Area as a double integral, Change of variables between Cartesian and polar co- ordinates- Triple integration- Volume as a triple integral

UNIT II

FOURIER SERIES :Dirichlet's condition-General Fourier series-Odd and even functions-Half range Fourier series-Parseval's identity-Harmonic analysis

UNIT III

COMPLEX DIFFERENTIATION :Functions of complex variable - analytic function - Necessary condition - Cauchy Riemann equation –Sufficient conditions(excluding proof) - Properties of analytic functions–Harmonicconjugate - Construction of analytic functions-Conformal Mapping- $w = z+a$, $w = az$, $w =1/z$. $w = z^2$ - Bilinear Transformation.

UNIT IV

COMPLEX INTEGRATION :Statement and applications of Cauchy's Integral theorem and formula-Taylor's and Laurent's expansions- Isolated singularities- Residues-Cauchy's residue theorem- Contour integration over unit circle and semi circular contour (excluding poles on boundaries)

UNIT V

LAPLACE TRANSFORM :Laplace Transforms-Condition for existence-Transforms of Elementary functions- Basic properties-Derivatives and integrals of transforms- Transforms of derivatives and integrals – Initial and Final value theorem- Transform of unit step functions and impulse function– Transform of periodic function-Inverse Laplace transform- Convolution theorem-Solution of linear ODE of second order with constant co- efficient, using Laplace transformation

REFERENCE BOOKS:

1. Kandasamy. P, Thilagavathy K and Gunavathy K, Engineering Mathematics for First year B.E/B.Tech, S.Chand and company Ltd, New Delhi-110055, Seventh Revised edition 2007
2. Veerarajan T , Engineering Mathematics (for First year) Tata Mc Graw Hill Publishing co.New Delhi 110008 (2008)
3. Grewal B.S , Higher Engineering Mathematics 38th edition , Khanna Publishers New Delhi (2004)



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Object oriented programming	UCS203

UNIT I

PRINCIPLES OF OOP: Software Crisis. Software Evolution .Programming Paradigms. Object Oriented Technology – Basic concepts and benefits of OOP . Application of OOP, OOP languages. **INTRODUCTION TO C++:** History of C++ , structure of C++, application of C++ ,tokens, keywords, identifiers, basic data types, derived data types, derived data types, symbolic constant, dynamic initialization, reference variables, scope resolution oprator,type modifiers, type casting operators and control statements, input and output statements in C++, function prototyping, function components, passing parameters call by reference, return by reference, inline function, default arguments, over loaded function introduction friend function .

UNIT II

CLASSES AND OBJECTS: Class specification, Member function definition, nested member function, access qualifiers, static data members and, member functions. Instance creation. Array of objects. Dynamic objects, Static Objects, Objects as arguments. Returning objects. **CONSTRUCTORS AND DESTRUCTORS:** Constructors- Parameterized constructors, Overloaded Constructors, Constructors with default arguments, copy constructors, Dynamic Constructors, dynamic initialization using Constructors. Destructors.

UNIT III

OPERATOR OVERLOADING: Operator function-overloading unary and binary operators, overloading the operator using Friend function, Stream operator overloading, Data conversion. **INHERITANCE:** Defining derived classes. Single Inheritance-Protected data with private inheritance. Multiple Inheritance. Multi Level Inheritance. Hierarchical Inheritance. Hybrid

Inheritance. Multipath Inheritance .Constructors in derived and base Class. Template in Inheritance. Abstract classes. Virtual function and Dynamic polymorphism. Virtual destructor. Nested Classes.

UNIT IV

FUNCTIONS IN C++ : Virtual functions- need for Virtual function, Pointer to derived class objects, Definition of Virtual functions, Array of Pointer to base class objects, Pure Virtual functions , Abstract 12 classes , Virtual Destructors, Generic Programming with Templates. Introduction, function templates, overloaded function templates, user defined templates arguments, class templates, Inheritance of class templates.

UNIT V

STREAM : Streams in C++, Stream classes, formatted and unformatted data, Manipulators, User defined Manipulators, file stream, file pointer and manipulation, file open and close, sequential and random access. EXCEPTION HANDLING: Principle of Exception handling, Exception handling mechanism, Multiple catch, Nested try, rethrowing the Exception.

REFERENCE BOOKS :

1. Robert Lafore, “Object Oriented Programming in C++”, Galgotia Publication Pvt. Ltd,4 th edition, New Delhi, 2002
2. Herbert Schildt , “ C++ : The Complete Reference”,TMH ,NewDelhi,2003.
3. Ashok N Kamathane, “Object Oriented Programming with ANSI & Turbo C++”, Pearson Education, New Delhi, 2003.
4. Bjarne Stroustrup,” C++ Programming language”, Pearson Education, New Delhi, 2001.
5. Stanley B Lippman and Josee Lajoie, “C++ Primer”, Pearson Education, ND, 2001.
6. Venugopal K R, Rajkumar Buyya and Ravishankar T,” Mastering C++”, TMH, ND, 2006.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Basics of Electrical Engineering	UCS204

UNIT I

FUNDAMENTALS OF DC AND AC CIRCUITS :Fundamentals of DC circuits: Ohm's law, Kirchhoff's law, Simple resistive circuits – Effect of series and parallel resistances – Mesh and Nodal analysis – Simple problems. Fundamentals of AC circuits: RMS and Average values of sine wave, Form factor, Peak factor. Single phase AC circuits – Impedance - Power and Power Factor – Series RL,RC, RLC circuits - Simple problems

UNIT II

FUNDAMENTALS OF MAGNETIC CIRCUIT :Ohm's law of magnetic circuit, Simple and composite magnetic circuits, Effect of air gap – leakage factor – fringing effect – Simple problems. Faraday's law of electromagnetic induction – Self and Mutually induced EMF – Statically and Dynamically induced EMF – Simple problems.

UNIT III

DC MACHINES AND TRANSFORMER : DC Machine: Construction – EMF equation of DC generator – Types of Generators and Motors – Characteristics..Transformer: Construction – EMF equation – Transformation ratio – Types of Single Phase Transformers.

UNIT IV

INDUCTION MACHINES : Three phase Induction Motor: Construction, Types – Principle of Operation – Torque Equation – Slip Vs Torque Characteristics of Cage and wound rotor. Single Phase Induction Motor: Principle of Operation – Types – Applications.

UNIT V

POWER SUPPLIES :Half and Full wave rectifier - Bridge rectifier - rectification efficiency – transformer utility factor -voltage regulator- introduction to SMPS and UPS.

REFERENCE BOOKS:

1. B.L.Theraja, “Electrical Technology”-Vol I&II–Nirja construction and development company, New Delhi.
2. V.N.Mittle, “Basic Electrical Engineering”, Tata Mc.Graw Hill, New Delhi, 2006.
3. V. Del Toro, “Electrical Engineering Fundamentals”, PHI, New Delhi, 1993.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Data Structures	UCS205

UNIT I

PROBLEM SOLVING :Problem solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample algorithms.

UNIT II

LISTS, STACKS AND QUEUES : Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT III

TREES: Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap

UNIT IV

SORTING : Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting

UNIT V

GRAPHS :Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth - First Search – Undirected Graphs –Biconnectivity – Introduction to NPCompleteness

REFERENCE BOOKS :

1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2 nd ed, Pearson Education Asia, 2002.
3. ISRD Group, "Data Structures using C", Tata McGraw Hill, 2007
4. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudo code Approach with C", ThomsonBrooks / COLE, 1998. YCS924



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Computer architecture	UCS206

UNIT I

BASIC STRUCTURE OF COMPUTERS :Functional units - Basic operational concepts - Bus structures-Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II

ARITHMETIC UNIT : Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III

BASIC PROCESSING UNIT: Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV

MEMORY SYSTEM :Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V

I/O ORGANIZATION :Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

REFERENCE BOOKS :

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5 th Edition “Computer Organization”, McGraw-Hill, 2002.
3. William Stallings, “Computer Organization and Architecture – Designing for 15 Performance”, 6 th Edition, Pearson Education, 2003.
5. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2 nd Edition, Morgan Kaufmann, 2002.
6. John P.Hayes, “Computer Architecture and Organization”, 3 rd Edition, McGraw Hill, 1998.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Object oriented programming Lab - I	UCS253

- 1 Implementation of Classes and Objects
- 2 Implementation of Function Overloading
- 3 Implementation of Inline function
- 4 Implementation of Call by Value and Call by reference
- 5 Implementation of Function Overloading
- 6 Implementation of Static data and member function
- 7 Implementation of Objects as arguments
- 8 Implementation of Array of Objects
- 9 Implementation of Static and Dynamic Objects
- 10 Implementation of Constructor and Destructor
- 11 Implementation of Overloading Unary operators
- 12 Implementation of Overloading Binary operators
- 13 Implementation of Operator Overloading using friend function
- 14 Implementation of Data conversion

15 Implementation of all types of Inheritance

16 Implementation of Virtual functions

17 Implementation of Template functions and template class

18 Implementation of Sequential and Random accessing of Files

19 Implementation of Exception Handling mechanism



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Second Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Data Structures Lab	UCS255

- 1 Implementation of Classes and Objects
- 2 Implementation of Function Overloading
- 3 Implementation of Inline function
- 4 Implementation of Call by Value and Call by reference
- 5 Implementation of Function Overloading
- 6 Implementation of Static data and member function
- 7 Implementation of Objects as arguments
- 8 Implementation of Array of Objects
- 9 Implementation of Static and Dynamic Objects
- 10 Implementation of Constructor and Destructor
- 11 Implementation of Overloading Unary operators
- 12 Implementation of Overloading Binary operators
- 13 Implementation of Operator Overloading using friend function
- 14 Implementation of Data conversion
- 15 Implementation of all types of Inheritance

16 Implementation of Virtual functions

17 Implementation of Template functions and template class

18 Implementation of Sequential and Random accessing of Files

19 Implementation of Exception Handling mechanism.

RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

SCHEME

Third Semester

S.No.	Subject Code	Subject Name	Marks Distribution				
			Internal	External		Total	
			Max	Max	Min	Max	Min
1	UCS301	Numerical methods	30	70	21	100	35
2	UCS 302	Object Oriented Programming -II	30	70	21	100	35
3	UCS 303	Principles of Data Communications	30	70	21	100	35
4	UCS 304	Database Management Systems	30	70	21	100	35
5	UCS 305	Software Engineering	30	70	21	100	35
6	UCS 306	Algorithm Design Techniques	30	70	21	100	35
Practical							
Total							
			Max		Min		
1	UCS 352	Object Oriented Programming Lab - II	50		25		
2	UCS 354	Database Management Systems Lab	50		25		



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Bsc(Computer Science)

Third Semester

Choice Based Credit System

MCA Year 1 Semester 1						
S.No.	Subject Code	SUBJECT NAME	PERIODS			Credit
			L	T	P	
1	UCS301	Numerical methods	3	1	0	4
2	UCS 302	Object Oriented Programming -II	3	1	0	4
3	UCS 303	Principles of Data Communications	3	1	0	4
4	UCS 304	Database Management Systems	3	1	0	4
5	UCS 305	Software Engineering	3	1	0	4
6	UCS 306	Algorithm Design Techniques	3	1	0	4
Practicals						
1	UCS 354	Object Oriented Programming Lab - II			2	1
2	UCS 354	Database Management Systems Lab			2	1
Total					8	26



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Numerical methods	UCS301

UNIT I

SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS

Linear interpolation methods (method of false position) – Newton’s method – Statement of Fixed Point Theorem – Fixed point iteration: $x=g(x)$ method – Solution of linear system by Gaussian elimination and Gauss-Jordan methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods- Inverse of a matrix by Gauss Jordan method – Eigenvalue of a matrix by power method.

UNIT II

INTERPOLATION AND APPROXIMATION

Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton’s forward and backward difference formulas.

UNIT III

NUMERICAL DIFFERENTIATION AND INTEGRATION

Derivatives from difference tables – Divided differences and finite differences –Numerical integration by trapezoidal and Simpson’s 1/3 and 3/8 rules – Romberg’s method – Two and Three point Gaussian quadrature formulas – Double integrals using trapezoidal and Simpson’s rules.

UNIT IV

INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS

Single step methods: Taylor series method – Euler and modified Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne's and Adam's predictor and corrector methods.

UNIT V

BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

REFERENCE BOOKS:

1. Gerald, C.F, and Wheatley, P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003
3. Balagurusamy, E., "Numerical Methods", Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 1999.
4. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Object Oriented Programming -II	UCS302

UNIT I

INTRODUCTION

Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.

UNIT II

PROGRAMMING IN C++

Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism

UNIT III

FILE HANDLING

C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling

UNIT IV

JAVA INTRODUCTION

An overview of Java, data types, variables and arrays, operators, control statements, classes, objects, methods – Inheritance.

UNIT V

JAVA PROGRAMMING

Packages and Interfaces, Exception handling, Multithreaded programming, Strings, Input /Output.

REFERENCE BOOKS

1. Herbert Schildt, "the Java 2 : Complete Reference", Fourth edition, TMH, 2002 (Unit IV, Unit-V)(Chapters 1-11,13,17)
2. Ira Pohl, "Object oriented programming using C++", Pearson Education Asia, 2003
3. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, 2000
4. John R.Hubbard, "Progranning with C++", Schaums outline series, TMH, 2003
5. H.M.Deitel, P.J.Deitel, "Java : how to program", Fifth edition, Prentice Hall of India private limited.
6. E.Balagurusamy " Object Oriented Programming with C++", TMH 2/e



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Principles of Data Communications	UCS303

UNIT I

BASICS OF COMMUNICATION

Basics of AM, FM and PM Block Diagram, Concepts of AM, FM modulators and demodulators - Pulse modulation systems - Pulse amplitude modulation - Sampling, Quantisation, Quantisation error.

UNIT II

INFORMATION THEORY & CODING

Discrete Messages - Concepts of entropy and information rate - Shannon's theorem - channel capacity - Orthogonal signals and their use - Introduction to coding - Coding and Decoding - Algebraic codes, burst error correction codes - Convolution coding and decoding .

UNIT III

DATA TRANSMISSION CONCEPTS

Concepts and Terminology- Analog and Digital transmission, Transmission impairments - Transmission media - Synchronous/Asynchronous transmission - Line Configurations - interfacing.

UNIT IV

DATA ENCODING

Digital data Digital signals - Variations of NRZ and biphase - Digital data Analog signals - ASK, FSK, PSK, QPSK - Analog Data Digital signals - PCM, DM.

UNIT V

DATA LINK CONTROL

Flow control, Error control - HDLC, Multiplexing.

REFERENCE BOOKS:

1. Taub and Schilling, "Principles of Communication Systems", Tata Mc Graw Hill Pub. Co., New Delhi, 2002.
2. William Stallings, "Data and Computer Communications", Sixth Edition, Pearson Education, Prentice Hall of India, New Delhi, 2002.
3. Prakash C. Gupta, "Data Communications", Prentice Hall of India, New Delhi, 2002



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Database Management Systems	UCS304

UNIT I

INTRODUCTION AND CONCEPTUAL MODELING

Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II

RELATIONAL MODEL

SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF).

UNIT III

DATA STORAGE AND QUERY PROCESSING

Record storage and Primary file organization- Secondary storage Devices- Operations on FilesHeap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree – Query Processing.

UNIT IV

TRANSACTION MANAGEMENT

Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V

CURRENT TRENDS

Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relationsComplex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML DocumentSchema- Querying and Transformation. – Data Mining and Data Warehousing.

REFERENCE BOOKS:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
3. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.
4. Hector Garcia-Molina, Jeffrey D.Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Software Engineering	UCS305

UNIT I

SOFTWARE PROCESS

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II

SOFTWARE REQUIREMENTS

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping - 21 S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III

DESIGN CONCEPTS AND PRINCIPLES

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems - Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT IV

TESTING

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT V

SOFTWARE PROJECT MANAGEMENT

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

REFERENCE BOOKS:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 6th edition, 2004.
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and Witold Pedrycz, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Algorithm Design Techniques	UCS306

UNIT I

INTRODUCTION

Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms.

UNIT II

DIVIDE AND CONQUER METHOD AND GREEDY METHOD

Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen's matrix multiplication – Greedy method – Prim's algorithm – Kruskal's algorithm – Dijkstra's algorithm.

UNIT III

DYNAMIC PROGRAMMING

Computing a binomial coefficient – Warshall's and Floyd's algorithm – Optimal binary search tree – Knapsack problem – Memory functions.

UNIT IV

BACKTRACKING AND BRANCH AND BOUND

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

UNIT V

NP-HARD AND NP-COMPLETE PROBLEMS

P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Traveling salesman problem – Knapsack problem.

REFERENCE BOOK:

1. Anany Levitin “Introduction to the Design and Analysis of Algorithms” Pearson Education 2003.
2. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, “Introduction to algorithms” Prentice Hall 1990.
3. SaraBaase and Allen Van Gelder, “Computer Algorithms – Introduction to Design and Analysis” Pearson education, 2003.
4. A.V.Aho, J.E Hopenfit and J.D.Ullman, “The Design and Analysis of Computer algorithms” Pearson education Asia, 2003.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Object Oriented Programming Lab - II	UCS352

C++

1. Programs Using Functions - Functions with default arguments - Implementation of Call by Value, Call by Address and Call by Reference
2. Simple Classes for understanding objects, member functions and Constructors - Classes with primitive data members - Classes with arrays as data members - Classes with pointers as data members – String Class - Classes with constant data members - Classes with static member functions
3. Compile time Polymorphism - Operator Overloading including Unary and Binary Operators. - Function Overloading
4. Runtime Polymorphism - Inheritance - Virtual functions - Virtual Base Classes - Templates
5. File Handling - Sequential access - Random access JAVA
6. Simple Java applications - for understanding reference to an instance of a class (object), methods - Handling Strings in Java
7. Simple Package creation.
 - Developing user defined packages in Java
8. Interfaces - Developing user-defined interfaces and implementation - Use of predefined interfaces
9. Threading - Creation of thread in Java applications - Multithreading
10. Exception Handling Mechanism in Java - Handling pre-defined exceptions - Handling user-defined exceptions



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Third Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Database Management Systems Lab	UCS354

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

SCHEME

Fourth Semester

S.No.	Subject Code	Subject Name	Marks Distribution				
			Internal	External		Total	
			Max	Max	Min	Max	Min
1	UCS401	Operations Research	30	70	21	100	35
2	UCS 402	Operating Systems	30	70	21	100	35
3	UCS 403	Internet Programming	30	70	21	100	35
4	UCS 404	Microprocessors	30	70	21	100	35
5	UCS 405	Compiler Design	30	70	21	100	35
6	UCS 406	Elective – I Management Information Systems	30	70	21	100	35
Practical							
Total							
			Max		Min		
1	UCS 453	Internet Programming Laboratory	50		25		
2	UCS 454	Microprocessors Lab	50		25		



RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

Fourth Semester

Choice Based Credit System

MCA Year 1 Semester 1						
S.No.	Subject Code	SUBJECT NAME	PERIODS			Credit
			L	T	P	
1	UCS401	Operations Research	3		0	3
2	UCS 402	Operating Systems	3	1	0	4
3	UCS 403	Internet Programming	3	1	0	4
4	UCS 404	Microprocessors	3	1	0	4
5	UCS 405	Compiler Design	3	1	0	4
6	UCS 406	Elective – I Management Information Systems	3		0	3
Practicals						
1	UCS 453	Internet Programming Lab			2	1
2	UCS 454	Microprocessors Lab			2	1
Total					8	20



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Operations Research	UCS401

UNIT I

LINEAR PROGRAMMING:

Principal components of decision problem – Modeling phases – LP Formulation and graphic solution – Resource allocation problems – Simplex method – Sensitivity analysis.

UNIT II

DUALITY AND NETWORKS:

Definition of dual problem – Primal – Dual relation ships – Dual simplex methods – Post optimality analysis – Transportation and assignment model shortest route problem.

UNIT III

INTEGER PROGRAMMING:

Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic) programming.

UNIT IV

CLASSICAL OPTIMISATION THEORY:

Unconstrained external problems, Newton – Ralphson method – Equality constraints – Jacobean methods – Lagrangian method – Kuhn – Tucker conditions – Simple problems.

UNIT V

OBJECT SCHEDULING:

Network diagram representation – Critical path method – Time charts and resource leveling – PERT.

REFERNECE BOOKS:

1. Anderson 'Quantitative Methods for Business', 8th Edition, Thomson Learning, 2002.
2. Winston 'Operation Research', Thomson Learning, 2003.
3. H.A.Taha, 'Operation Research', Prentice Hall of India, 2002.
4. Vohra, 'Quantitative Techniques in Management', Tata McGraw Hill, 2002.
5. Anand Sarma, 'Operation Research', Himalaya Publishing House, 2003.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Operating Systems	UCS402

UNIT I

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

UNIT II

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

REFERENCE BOOKS

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.
2. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.
3. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Internet Programming	UCS403

UNIT I

BASIC NETWORK AND WEB CONCEPTS

Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

UNIT II

JAVA PROGRAMMING

Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client/server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.

UNIT III

SCRIPTING LANGUAGES

HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications

UNIT IV

DYNAMIC HTML

Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT V

SERVER SIDE PROGRAMMING

Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

REFERENCE BOOKS

1. Deitel, Deitel and Nieto, “Internet and World Wide Web – How to program”, Pearson Education Publishers, 2000.
2. Elliotte Rusty Harold, “Java Network Programming”, O’Reilly Publishers, 2002
3. R. Krishnamoorthy & S. Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004.
4. Thomno A. Powell, “The Complete Reference HTML and XHTML”, fourth edition, Tata McGraw Hill, 2003.
5. Naughton, “The Complete Reference – Java2”, Tata McGraw-Hill, 3rd edition, 1999.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Microprocessor	UCS404

UNIT I

THE 8085 MICROPROCESSOR

Introduction to 8085 – Microprocessor architecture – Instruction set – Programming the 8085 – Code conversion.

UNIT II

8086 SOFTWARE ASPECTS

Intel 8086 microprocessor – Architecture – Instruction set and assembler directives – Addressing modes – Assembly language programming – Procedures – Macros – Interrupts and interrupt service routines.

UNIT III

8086 SYSTEM DESIGN

8086 signals and timing – MIN/MAX mode of operation – Addressing memory and I/O – Multiprocessor configurations – System design using 8086

UNIT IV

I/O INTERFACING

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications.

UNIT V

MICROCONTROLLERS

Architecture of 8051 – Signals – Operational features – Memory and I/O addressing – Interrupts – Instruction set – Applications.

REFERENCE BOOKS

1. Ramesh S.Gaonkar, “Microprocessor - Architecture, Programming and Applications with the 8085”, Penram International publishing private limited, fifth edition. UNIT-1: – Chapters 3,5,6 and programming examples from chapters 7-10)
2. A.K. Ray & K.M.Bhurchandi, “Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing”, TMH, 2002 reprint. (UNITS 2 to 5: – Chapters 1-6, 7.1-7.3, 8, 16)
3. Douglas V.Hall, “Microprocessors and Interfacing: Programming and Hardware”, TMH, Third edition
4. Yu-cheng Liu, Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design”, PHI 2003.
5. Mohamed Ali Mazidi, Janice Gillispie Mazidi, “The 8051 microcontroller and embedded systems”, Pearson education, 2004.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Compiler Design	UCS405

UNIT I

INTRODUCTION TO COMPILING

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II

SYNTAX ANALYSIS

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.

UNIT III

INTERMEDIATE CODE GENERATION

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT IV

CODE GENERATION

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V

CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

REFERENCE BOOKS:

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, “Compilers Principles, Techniques and Tools”, Pearson Education Asia, 2003.
2. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003.
4. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Management Information Systems	UCS406

UNIT I

INFORMATION SYSTEM AND ORGANIZATION

Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development – User role in Systems Development Process – Maintainability and Recoverability in System Design.

UNIT II

REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE

Models for Representing Systems: Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics – Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

UNIT III

SYSTEMS, INFORMATION AND DECISION THEORY

Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty – Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

UNIT IV

INFORMATION SYSTEM APPLICATION

Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning – Other use of Information Technology: Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

UNIT V

DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEM

Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off-the shelf software packages – Outsourcing – Comparison of different methodologies

TEXT BOOKS:

1. Laudon K.C, Laudon J.P, Brabston M.E, “Management Information Systems - Managing the digital firm”, Pearson Education, 2004.
2. Turban E.F, Potter R.E, “Introduction to Information Technology”; Wiley, 2004.
3. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, “Modern Systems Analysis and Design”, Third Edition, Prentice Hall, 2000.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Internet Programming Lab	UCS453

LIST OF EXPERIMENTS

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features: Create a color palette with matrix of buttons Set background and foreground of the control text area by selecting a color from color palette In order to select Foreground or background use check box control as radio buttons To set background images
4. Write programs in Java to do the following. Set the URL of another server. Download the homepage of the server. Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following: HTTP request FTP SMTP POP3
6. Write a program in Java for creating simple chat application with datagram sockets and atagram packets.
7. Write programs in Java using Servlets: To invoke servlets from HTML forms To invoke servlets from Applets

8. Write programs in Java to create three-tier applications using servlets for conducting on-line examination. f or displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML To embed a map in a web page To fix the hot spots in that map Show all the related information when the hot spots are clicked.
10. Create a web page with the following. i) Cascading style sheets. ii) Embedded style sheets. iii) Inline style sheets. iv) Use your college information for the web pages.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fourth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Microprocessors Lab	UCS454

LIST OF EXPERIMENTS

1. Programming with 8085 – 8-bit / 16-bit multiplication/division using repeated addition/subtraction
2. Programming with 8085-code conversion, decimal arithmetic, bit manipulations.
3. Programming with 8085-matrix multiplication, floating point operations
4. Programming with 8086 – String manipulation, search, find and replace, copy operations, a. Sorting. (PC Required)
5. Using BIOS/DOS calls: Keyboard control, display, file manipulation. (PC Required)
6. Using BIOS/DOS calls: Disk operations. (PC Required)
7. Interfacing with 8085/8086 – 8255, 8253
8. Interfacing with 8085/8086 – 8279,8251
9. 8051 Microcontroller based experiments – Simple assembly language programs (cross assemble required).
10. 8051 Microcontroller based experiments – Simple control applications (cross assembler required).

RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

SCHEME

Fifth Semester

S.No.	Subject Code	Subject Name	Marks Distribution				
			Internal	External		Total	
			Max	Max	Min	Max	Min
1	UCS501	Computer Networks	30	70	21	100	35
2	UCS 502	Artificial Intelligence	30	70	21	100	35
3	UCS 503	Computer Graphics	30	70	21	100	35
4	UCS 504	Multimedia Systems	30	70	21	100	35
5	UCS 505	Elective – II Image Processing	30	70	21	100	35
6	UCS 506	Elective – III Client Server Computing	30	70	21	100	35
Practical							
Total							
			Max		Min		
1	UCS 551	Computer Networks Lab	50		25		
2	UCS 553	Graphics Lab	50		25		



RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

Fifth Semester

Choice Based Credit System

MCA Year 1 Semester 1						
S.No.	Subject Code	SUBJECT NAME	PERIODS			Credit
			L	T	P	
1	UCS501	Computer Networks	3	1	0	4
2	UCS 502	Artificial Intelligence	3	1	0	4
3	UCS 503	Computer Graphics	3	1	0	4
4	UCS 504	Multimedia Systems	3	1	0	4
5	UCS 505	Elective – II Image Processing	3		0	3
6	UCS 506	Elective – III Client Server Computing	3		0	3
Practicals						
1	UCS 551	Computer Networks Lab			2	1
2	UCS 553	Graphics Lab			2	1
Total					8	24



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Computer Networks	UCS501

UNIT I

DATA COMMUNICATIONS

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II

DATA LINK LAYER

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III

NETWORK LAYER

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV

TRANSPORT LAYER

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V

APPLICATION LAYER

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

REFERENCE BOOKS

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.
2. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
3. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
4. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	ARTIFICIAL INTELLIGENCE	UCS502

UNIT I

INTRODUCTION

Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.

UNIT II

SEARCHING TECHNIQUES

Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT III

KNOWLEDGE REPRESENTATION

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – propositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

UNIT IV

LEARNING

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

UNIT V

APPLICATIONS

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language 32 processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

REFERENCE BOOKS:

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.
2. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd., 2000.
3. Elaine Rich and Kevin Knight, “Artificial Intelligence”, 2nd Edition, Tata McGraw-Hill, 2003.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Computer Graphics	UCS503

UNIT I

INTRODUCTION & OVERVIEW OF GRAPHICS SYSTEMS

Introduction - Computer Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image processing – Graphical User Interface – Video Display Devices – Raster Scan Systems – Random Scan Systems – Graphics monitors and workstations – Input Devices – Hard Copy Devices – Graphics Software

UNIT II

OUTPUT PRIMITIVES & ATTRIBUTES OF OUTPUT PRIMITIVES

Points and Lines – Line Drawing Algorithms – Loading the frame buffer – Line function – Circle generating algorithms – Ellipse generating algorithms – Filled area primitives – Line attributes – Curve Attributes – Color and Grayscale Levels – Area-Fill attributes – Character Attributes – Inquiry Functions - Antialiasing

UNIT III

TWO DIMENSIONAL GEOMETRIC TRANSFORMATIONS

Basic transformations – Matrix representations – Composite Transformations – other transformations - Affine Transformations – Transformation Functions – Raster Methods for Transformations – Viewing Pipeline – Window-to-Viewport coordinate Transformation – Two Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

UNIT IV

GRAPHICAL USER INTERFACES & INTERACTIVE INPUT METHODS

The user Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques – Virtual Reality Environments – Three Dimensional Object Representation: polygon surfaces-curved line and surfaces-Quadric surface-super Quadrics - Blobby objects - Bezier curves and surfaces - constructive solid geometry methods – Octrees - BSP trees.

UNIT V

THREE DIMENSIONAL CONCEPTS & APPLICATIONS

Three dimensional geometric and modeling transformations - Visible-surface Detection methods-polygon rendering methods-color models and color applications-computer animation

REFERENCE BOOKS:

1. Donald Hearn and Pauline Baker, “Computer Graphics C version”, Pearson Education, 2003.
2. Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles & Practice”, Pearson Education 2003.
3. Schaum’s Outline of Computer Graphics By Zhigang Xiang and Roy A Plastock , TMH 2000



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Multimedia Systems	UCS504

UNIT I

INTRODUCTION TO MULTIMEDIA

Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia-Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext

UNIT II

MULTIMEDIA FILE HANDLING

Sound – Images – Animation - Video

UNIT III

DIGITAL VIDEO AND IMAGE COMPRESSION

Evaluating a compression system - Redundancy and visibility-Video compression techniquesStandardization of an algorithm - The JPEG image compression standardITU –T Standards - MPEG motion video compression standard-DVI Technology.

UNIT IV

HARDWARE, SOFTWARE AND MULTIMEDIA AUTHORIZING TOOL

ultimedia Hardware: Macintosh and Windows production platforms-Hardware Peripherels: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools

UNIT V

MULTIMEDIA AND INTERNET

Internetworking –connections -Internet services -Tools for WWW - Designing WWW.

REFERENCE BOOKS:

1. Multimedia: Making It Work, Tay Vaughan, 7th Edition, Tata Mc-Graw Hill. 2.
2. Multimedia Systems, John F.Koegel Buford, Pearson edition, 2003. (unit III).
3. Ranjan Parekh, Principles of Multimedia, TMH, 2006.
4. Multimedia: Computing, Communication and applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Edition, 2001.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Elective – II Image Processing	UCS505

UNIT I

DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS

Elements of visual perception – Image sampling and quantization Basic relationship between pixels – Basic geometric transformations-Introduction to Fourier Transform and DFT – Properties of 2D Fourier Transform – FFT – Separable Image Transforms -Walsh – Hadamard – Discrete Cosine Transform, Haar, Slant – Karhunen – Loeve transforms.

UNIT II

IMAGE ENHANCEMENT TECHNIQUES

Spatial Domain methods: Basic grey level transformation – Histogram equalization – Image subtraction – Image averaging –Spatial filtering: Smoothing, sharpening filters – Laplacian filters – Frequency domain filters : Smoothing – Sharpening filters – Homomorphic filtering.

UNIT III

IMAGE RESTORATION:

Model of Image Degradation/restoration process – Noise models – Inverse filtering -Least mean square filtering – Constrained least mean square filtering – Blind image restoration – Pseudo inverse – Singular value decomposition.

UNIT IV

IMAGE COMPRESSION

Lossless compression: Variable length coding – LZW coding – Bit plane coding- predictive coding-DPCM. Lossy Compression: Transform coding – Wavelet coding – Basics of Image compression standards: JPEG, MPEG,Basics of Vector quantization.

UNIT V

IMAGE SEGMENTATION AND REPRESENTATION

Edge detection –Thresholding - Region Based segmentation – Boundary representation: chain codes- Polygonal approximation –Boundary segments –boundary descriptors: Simple descriptors-Fourier descriptors - Regional descriptors –Simple descriptors- Texture

REFERENCE BOOKS

1. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.
2. William K Pratt, Digital Image Processing John Willey (2001)
3. Image Processing Analysis and Machine Vision – Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Larniy (1999).
4. A.K. Jain, PHI, New Delhi (1995)-Fundamentals of Digital Image Processing.
5. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India, 2000



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Elective – III Client Server Computing	UCS506

UNIT I

INTRODUCTION

Client Server Computing era, Real Client/Server, Fat Servers or fat clients, 2 tier Vs 2 tier, Intergalactic client server, client server for different models, building blocks

UNIT II

CLIENT/SERVER OPERATION SYSTEMS

Anatomy of Server programs, Server needs from OS, Server scalability, Client anatomy, Client needs from OS, Client OS trends, MAC OS, Linux OS, Win OS, Server OS trends, NetWare, Win 2000 Server, OS/2 warp server

UNIT III

CLIENT SERVER MIDDLEWARE

NOS Middleware, global directory services, X.500, LDAP, distributed time services, distributed security services, RPC messaging and peer to peer, Sockets, NetWare, NetBIOS, remote procedure call, messaging and queuing, MOM Vs RPC, Evolution of the NOS, DCE, The enterprise NOS, the internet as NOS

UNIT IV

CLIENT SERVER TRANSACTION PROCESSING

ACID properties, Transaction Models, TP Monitor, TP Monitor and OS, TP Monitor and Transaction Management, TP Monitor Client/ Server Interaction types, Transactional RPC, Queues, TP Lite or TP Heavy, TP Lite versus TP Heavy – Managing Heterogeneous networks, Process Management, client/server invocations, Performance

UNIT V

CLIENT SERVER AND INTERNET

Client server and internet, Web client server, 3 tier client server web style, CGI, the server side of web, CGI and State, SQL database servers, Middleware and federated databases, data warehouses, EIS/DSS to data mining, GroupWare Server, what is GroupWare, components of GroupWare

REFERENCES:

1. Robert Orfali, Dan Harkey & Jeri Edwards, “Essential Client/Server Survival Guide”, second edition, John Wiley & Sons, Singapore, 2003
2. James E. Goldman, Phillip T. Rawles, Julie R. Mariga, “ Client/Server Information Systems, A Business Oriented Aproach”, John Wiley & Sons, Singapore, 2000.
3. Eric J Johnson, “ A complete guide to Client/Server Computing”, first edition, Prentice Hall, New Delhi, 2001.
4. Smith & Guengerich, “Client/Server Computing”, Prentice Hall, New Delhi, 2002



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Graphics Lab	UCS551

1. To implement Bresenham's algorithms for line, circle and ellipse drawing
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and shearing.
3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To visualize projections of 3D images.
6. To convert between color models.
7. To implement text compression algorithm
8. To implement image compression algorithm
9. To perform animation using any Animation software
10. To perform basic operations on image using any image editing software



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Fifth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Computer Networks Lab	UCS553

1. Applications using TCP Sockets like a. Echo client and echo server b. File transfer c. Remote command execution d. Chat e. Concurrent server

2. Applications using UDP Sockets like

a. DNS

b. SNMP

3. Applications using Raw Sockets like a. Ping b. Trace route

4. RPC

5. Experiments using simulators like OPNET:

a. Performance comparison of MAC protocols

b. Performance comparison of Routing protocols

c. Study of TCP/UDP performance

RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

SCHEME

Sixth Semester

S.No.	Subject Code	Subject Name	Marks Distribution				
			Internal	External		Total	
			Max	Max	Min	Max	Min
1	UCS601	Principles of Management	30	70	21	100	35
2	UCS 602	Information Security	30	70	21	100	35
3	UCS 603	Elective – IV Advanced DBMS	30	70	21	100	35
4	UCS 604	Elective – V Software Project Management	30	70	21	100	35
5	UCS 605	Elective – VI Distributed Operating Systems	30	70	21	100	35
Practical							
Total							
			Max		Min		
1	UCS 656	Project Work	50		25		



RKDF UNIVERSITY, RANCHI

New Scheme of Examination as per AICTE Flexible Curricula

Bsc(Computer Science)

Sixth Semester

Choice Based Credit System

MCA Year 1 Semester 1						
S.No.	Subject Code	SUBJECT NAME	PERIODS			Credit
			L	T	P	
1	UCS601	Principles of Management	3	0	0	3
2	UCS 602	Information Security	3	1	0	4
3	UCS 603	Elective – IV Advanced DBMS	3	1	0	4
4	UCS 604	Elective – V Software Project Management	3	1	0	4
5	UCS 605	Elective – VI Distributed Operating Systems	3		0	3
Practicals						
1	UCS 656	Project Work				6
Total						24



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Sixth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Principles of Management	UCS601

UNIT I

HISTORICAL DEVELOPMENT

Definition of Management – Science or Art – Management and Administration – Development of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organisation.

UNIT II

PLANNING

Nature & Purpose – Steps involved in Planning – Objectives – Setting Objectives – Process of Managing by Objectives – Strategies, Policies & Planning Premises- Forecasting – Decisionmaking.

UNIT III

ORGANISING

Nature and Purpose – Formal and informal organization – Organization Chart – Structure and Process – Departmentation by difference strategies – Line and Staff authority – Benefits and Limitations – De-Centralization and Delegation of Authority – Staffing – Selection Process - Techniques – HRD – Managerial Effectiveness.

UNIT IV

DIRECTING

Scope – Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership Motivation – Hierarchy of needs – Motivation theories – Motivational Techniques – Job Enrichment – Communication – Process of Communication – Barriers and Breakdown – Effective Communication – Electronic media in Communication.

UNIT V

CONTROLLING

System and process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology in Controlling – Use of computers in handling the information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global theory of Management.

REFERENCE BOOKS:

1. Harold Koontz & Heinz Weihrich “Essentials of Management”, Tata McGraw-Hill, 1998.
2. Joseph L Massie “Essentials of Management”, Prentice Hall of India, (Pearson) Fourth Edition, 2003.
3. Tripathy PC And Reddy PN, “Principles of Management”, Tata McGraw-Hill, 1999.
4. Decenzo David, Robbin Stephen A, ”Personnel and Human Reasons Management”, Prentice Hall of India, 1996



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Sixth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Information Security	UCS602

UNIT I

INTRODUCTION

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II

SECURITY INVESTIGATION

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III

SECURITY ANALYSIS

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV

LOGICAL DESIGN

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V

PHYSICAL DESIGN

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

REFERENCE BOOKS:

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
3. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
4. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Sixth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Elective – IV Advanced DBMS	UCS603

UNIT I

DATABASE MANAGEMENT

Relational Data Model – SQL - Database Design - Entity-Relationship Model – Relational Normalization – Embedded SQL – Dynamic SQL – JDBC – ODBC.

UNIT II

ADVANCED DATABASES

Object Databases - Conceptual Object Data Model – XML and Web Data – XML Schema – Distributed Data bases – OLAP and Data Mining – ROLAP and MOLAP

UNIT III

QUERY AND TRANSACTION PROCESSING

Query Processing Basics – Heuristic Optimization – Cost, Size Estimation - Models of Transactions – Architecture – Transaction Processing in a Centralized and Distributed System – TP Monitor.

UNIT IV

IMPLEMENTING AND ISOLATION

Schedules – Concurrency Control – Objects and Semantic Commutativity – Locking – Crash, Abort and Media Failure – Recovery – Atomic Termination – Distributed Deadlock – Global Serialization – Replicated Databases – Distributed Transactions in Real World.

UNIT V

DATABASE DESIGN ISSUES

Security – Encryption – Digital Signatures – Authorization – Authenticated RPC - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

REFERENCE BOOKS:

1. Philip M. Lewis, Arthur Bernstein, Michael Kifer, “Databases and Transaction Processing: An Application-Oriented Approach”, Addison-Wesley, 2002
2. R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, 3rd Edition, Addison Wesley, 2004
3. Abraham Silberschatz, Henry. F. Korth, S.Sudharsan, Database System Concepts, 4th Edition., Tata McGraw Hill, 2004
4. Raghu Ramakrishnan & Johannes Gehrke, “Database Management Systems”, 3rd Edition, TMH, 2003



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Sixth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Elective – V Software Project Management	UCS604

UNIT I

INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

Project Definition – Contract Management – Activities Covered by Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II

PROJECT EVALUATION

Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation. – software effort estimation

UNIT III

ACTIVITY PLANNING

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning and Control.

UNIT IV

MONITORING AND CONTROL

Resource allocation - identifying and scheduling resources – publishing resource and cost schedule – scheduling sequence - Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V

MANAGING PEOPLE AND ORGANIZING TEAMS

Introduction – Understanding Behavior – Organizational Behaviour - Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team – Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

TEXT BOOK:

1. Bob Hughes, Mikecoterrell, “Software Project Management”, Third Edition, Tata McGraw Hill, 2004.

REFERENCE BOOKS:

1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, “Software Project Management”, Pearson Education, 1999.
3. Jalote, “Software Project Management in Practice”, Pearson Education, 2002.
4. Robert T. Futrell, Donald F. Shefer and Linda I. Shefer, “Quality Software Project Management”, Pearson Education, 2003.



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Sixth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Elective – VI Distributed Operating Systems	UCS605

UNIT I

Fundamentals – evolution – System Models – Distributed operating System – Issues – Distributed Computing environment Message passing – Introduction – Features – Issues – Synchronization – Buffering – Message – Encoding – Decoding – Process addressing – Failure Handling.

UNIT II

Remote Procedure calls – Introduction – Model – Transparency – Implementation – Stub Generation – Messages – Marshaling Arguments and results –server Management – Parameter passing Semantics - Call Semantics – Communication Protocols – Complicated 51 RPC's – Client – Server Binding – Exception handling – Security Distributed shared Memory – Introduction – Architecture – Issues – Granularity Structure – Consistency Models – Replacement Strategy – Thrashing.

UNIT III

Synchronization – Introduction – Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock – Election Algorithms.

UNIT IV

Resource Management – Introduction – Features – Task Assignment approach – LoadBalancing Approach - Load -Sharing Approach Process Management – Introduction – Process Migration – Threads

UNIT V

Distributed File Systems – Introduction – Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles Naming – Introduction – Features – Terminologies – Concepts.

REFERENCE BOOKS:

1. Pradeep K. Sinha, “Distributed Operating Systems, Concepts and Design” Prentice Hall of India, New Delhi, 2001.
2. Andrew S. Tanenbaum “Distributed Operating Systems”, Pearson Education, New Delhi, 2002
3. Mukesh Singhal and Nirajan G.Shivaratri “Advanced Concepts in Operating Systems”, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001



R.K.D.F. UNIVERSITY, RANCHI

Bsc(Computer Science)

Sixth Semester

Branch	Subject Title	Subject Code
Bsc(CS)	Project Work	UCS656

The project will be one semester duration. The student will be sent to different organizations involved in science communication activities as per interest and specialization of students, mostly located in the place of the study. They will have to carry out a project work related to the area of interest and submit a research project report at the end of the semester . The students shall defend their dissertation in front of experts during viva-voce examinations.