

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME

Choice Based Credit System

Bachelor of Computer Application (BCA)

Total Credits = 146

Year Ist, Semester Ist

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem Exam	
				L	T	P	C	UE	TA	Total	ESE	
1.	Foundation	MT103	Mathematics I	3	1	0	4	40	20	60	40	100
2.	Foundation	LN104	Essential Professional Communication	3	1	0	4	40	20	60	40	100
3.	Core	CA101	Programming in C	3	1	0	4	40	20	60	40	100
4.	Core	CA102	Computer Fundamentals and Programming Concepts	3	1	0	4	40	20	60	40	100
5.	Foundation	ES115	Fundamentals of Environmental Science	3	1	0	4	40	20	60	40	100
6.	Core	CA103	C Programming Lab	0	0	3	2	40	20	60	40	100
7.	Core	CA104	Computer Application Lab	0	0	3	2	40	20	60	40	100
8.	Foundation	LN152	Basic Professional Communication Lab	0	0	2	1	40	20	60	40	100
Total				15	5	8	25					800

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **UE** – Unit Exam **TA** – Teacher Assessment
Sessional Total (CA) = Unit Exam + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

MT103 MATHEMATICS-I

w.e.f. Session 2015-16

L T P
3 1 0

UNIT –I

Trigonometry and Complex Numbers:

Trigonometry: Trigonometry Functions, Functions of angles of any magnitude, Compound and multiple angles, Inverse circular functions.

Complex Numbers: Modules, Argument of complex number, Polar form, vector form, Complex conjugate, Algebraic operations, De-Moivre's theorem, Roots of a complex number.

[8]

UNIT –II

Matrices and Determinants:

Definition of different types of matrix, Algebraic operations, Symmetric & skew symmetric matrix, Transpose of matrix, Orthogonal matrices, Rank of matrix, Determinant of a square matrix, Inverse of a square matrix, Solution of Linear Equations by Cramer's Rule and Gauss-Elimination method, Eigen values & Eigen vectors of a square matrix.

[8]

UNIT –III

Differential Calculus:

Limit, Continuity and differentiability of functions, Differentiation Rules, Differentiation of functions (Algebraic, Trigonometric, Logarithmic, Exponential and Inverse trigonometric functions), Tangent and normal lines, Condition of tangency, Extreme values of functions. [8]

UNIT –IV

Integral Calculus:

Indefinite integrals, Basic formulae, Integration by parts, Integration by substitution, Definite integrals, Properties of definite integrals, Evaluation of double integration & triple integration, Application of definite integral to find Area and Volume.

[8]

UNIT-V

Vector Calculus:

Vectors in a plane, Linear dependence and independence of vectors, Vectors in space, Dot and cross-product of vectors, Gradient of vectors, Divergence of vectors, Curl of vectors, Physical interpretation of gradient, Divergence and curl of vectors.

[8]

REFERENCES:

1. 12th N.C.E.R.T. Book
2. Differential calculus by Shanti Narayan, S. Chand.
3. Integral Calculus by M. Roy & S. S. Seth, Sivalal Agarwala & Company.
4. Introduction to Engineering Mathematics I by H.K. Dass, S. Chand.

LN 104 ESSENTIAL PROFESSIONAL COMMUNICATION

w.e.f. Session 2015-16

L T P
3 1 0

UNIT- I

Professional Communication:

Professional Communication: Its meaning & importance, Essentials of Effective Communication, Barriers to Effective Communication, The Cross Cultural Dimensions of Professional Communication. [8]

UNIT-II

Language through Literature

A. Essays

“The Effect of the Scientific Temper on Man” by Bertrand Russell
“The Aims of Science and Humanities” by Moody E. Prior

B. Short Stories

“The Meeting Pool” by Ruskin Bond
“The Portrait of a Lady” by Khushwant Singh [8]

UNIT-III

Basic Vocabulary:

Euphemism , One-word Substitution, Synonyms, Antonyms, Homophones, Idioms and Phrases, Common mistakes, Confusable words and expressions, Portmanteau words, Foreign words and expressions. [8]

UNIT-IV

Basic Grammar:

Articles, Prepositions, Tenses, Concord (Subject-Verb agreement), Modal Auxiliaries, Verbs: its Kind & Uses, Degrees of Comparison, Punctuation. [8]

UNIT-V

Basic Composition:

Report writing: What is a report? Kinds and objectives of reports, writing reports.

Business Letter writing: Introduction to business letters, types of business letters, Layout of business letters, Letter of Enquiry / Complaint. [8]

Proposal writing.

REFERENCES:

1. Lata , Pushp & Kumar, Sanjay, “Communication Skills” , Oxford University Press-2012
2. Quintanilla ,Kelly M. & Wahl ,Shawn T, “Business and Professional Communication”, Sage Publications India Pvt. Ltd-2011
3. Juneja, Om P & Mujumdar, Aarati. “Business Communication :Techniques and Methods”, Orient Black Swan-2010
4. Arora, V. N. & Chandra, Lakshmi, “Improve Your Writing: From Comprehensive to Effective Writing”, Oxford University Press-2010 (For the prescribed essays- “The Effect of the Scientific Temper on Man” by Bertrand Russell &“The Aims of Science and Humanities” by Moody E. Prior)

5. Mukherjee, Meenakshi, "Let's Go Home and Other Stories", Orient Black Swan-2009 (For the prescribed short stories-"The Meeting Pool" by Ruskin Bond, "The Portrait of a Lady" by Khushwant Singh)
6. Quirk, Randolph & Greenbaum, Sidney, "A University Grammar of English", Pearson-2013
7. Bolton, David & Goodey, Noel, "English Grammar in Steps", Orient Black Swan.
8. Sethi, J., "Standard English And Indian Usage: Vocabulary and Grammar", PHI Learning Pvt. Ltd. -2011
9. Bhaskaran, M. P. & Horsburgh, D., "Strengthen Your English", Oxford University -1973
10. Greenbaum, Sidney, "The Oxford English Grammar", Oxford University Press, New York -1996
11. Bovee, Courtland L. & Thill, John V, ".Business Communication Essentials", Pearson
12. Board of Editors, "Written and Spoken Communication in English", University Press-2007
13. Gairns, R. & Radman, S., "Working with Words: A Guide to Teaching and Learning Vocabulary Building", Cambridge: Cambridge University Press-1986
14. Lewis, M. H., "Words Power Made Easy", Goyal Publishers and Distributors Pvt. Ltd-1979
15. McCarthy, M., "Vocabulary", Oxford University Press-1990

CA101 PROGRAMMING IN C

w.e.f. Session 2015-2016

L T P

3 1 0

UNIT –I

Overview of C Language: Introduction and History of C Programming Language, Salient features of C, Structure of C programs.

C Language Fundamentals: Character set, C Tokens, Keywords, Identifiers, Modifiers, Variables: Declaration and Initialization of variables, Scope of variables, Constant, Types of constant, Data type and sizes, Typedef, Execution and Compilation of C programs, Error, Types of error.

Input-Output Operation: getchar() and putchar() functions, scanf() and printf() functions.

Formatting of Outputs: Formatting of integers, floating point values and characters. [8]

UNIT –II

Operators and Expressions: Types of operators: Unary and Binary operators, Assignment, Arithmetic, Relational & logical operators, Increment and Decrement operators, conditional operators, sizeof() operator, Comma operator, Conditional operator & Bit wise operators, Type conversion.

Expressions: Types of expression, Precedence and order of evaluation.

Decision Control Statements: if, if-else, Nested if else, else if ladder, Switch statement, Break, Continue, goto statement.

Loops: for, while, do-while, Nesting of loops. [8]

UNIT –III

Functions and Pointers: Built-in and user-defined function, Types of user defined function, Function prototype declaration, Function call, and function definition, Nesting of functions, Recursive functions, Storage Classes(static, automatic, register, extern)

Pointers: Introduction, Pointer operators (&,*), Pointer Arithmetic, parameter passing: Call by value, Call by reference, Pointer to Pointer, Dynamic Memory Allocation, calloc() and malloc() functions. [8]

UNIT –IV

Arrays and String: Defining Array, Types of Array, Declaration, initialization of Linear and Multidimensional arrays, Array and functions, passing arrays to functions.

String: Character Arrays, Arrays and strings, String Manipulation, String functions. [8]

UNIT –V

Structure and Union: Defining structure and union, Declaration and initialization of structure and union variables, Differences between structure and union, enumeration. Macros and C Preprocessor.

File Handling in C: Operation on Files (Opening and Closing a data file, creating a data file), File I/O functions (Read and Write functions), and Command line arguments. [8]

REFERENCES:

1. Gottfried, "Programming in C", Schaum's Series, Tata McGraw Hill.
2. Kernighan, Ritchie, "The C Programming Language", PHI.
3. Yashwant Kanitkar, "Working with C", BPB.
4. Yashwant Kanitkar, "Pointer in C", BPB.
5. Yashwant Kanitkar, "Let us C", BPB.
6. Bajpai, Kushwaha, Yadav, "Computers & C Programming", New Age.
7. E. Balagurusamy, "Programming in ANSI C", TMH

CA102 COMPUTER FUNDAMENTALS AND PROGRAMMING CONCEPTS

w.e.f. Session 2015-2016

L T P
3 1 0

UNIT-I

An Introduction to Computer: Block Diagram of Computer; Characteristics of Computer, Classification of Computers, History of Computers, Generation of Computers.

Computer Hardware: Mouse, Keyboard, Scanner, Printer, Monitor.

Memory: RAM, ROM, Types of ROM, Secondary Memory.

Number System: Binary, Octal, Hexadecimal, Base Conversion, and Binary Arithmetic's.[8]

UNIT-II

Software concepts: Definition, System Software, Application Software, Utility Package.

Operating System: Elementary Concept of Operating System, Functions, Textual vs GUI Interface, Introduction to DOS, MS Windows and UNIX Operating System, Various DOS and UNIX Commands. [8]

UNIT-III

Networking: Definition, Types of Network: LAN, MAN, WAN, Network Topologies: Star, Ring, Bus, Mesh, ISO-OSI Reference Model, TCP/IP Model.

Internet: Definition, Uses, Advantages & Disadvantages of Internet, Services, WWW, E-mail, Web browsers, Understanding Internet Address, HTTP, TCP/IP, Telnet, FTP, Search Engines, Safeguarding the Internet. [8]

UNIT-IV

Programming Paradigms: Definition of Program, Qualities of a Good Program, Software Development Life Cycle, Problem Solving Strategy.

Structured Programming: Objectives, Programming Functions and Program Structures, Program Constructs: Sequence, Selection, Iteration, Stepwise Refinement, Concept of Modular Programming: Top-Down and Bottom-Up Programming Style. [8]

UNIT-V

Programming Languages: Concept, Generation of Languages, Classification of languages, and Introduction to Compiler, Interpreter, and Assembler, Fourth Generation Languages (4GL).

Introduction to Algorithm: Definition, Efficiency of Algorithm, Algorithm Analysis, Examples of Algorithm.

Introduction to Flowchart: Conventions, Advantages and Limitations, Types of Logic used in Flowcharts: Sequential Control, Branching, Looping, Types of Flow Charts: Program and System Flow Chart, Examples of Flow Charts. [8]

REFERENCES:

1. V. Rajaraman, "Fundamentals of Computers", PHI
2. Peter Norton's, "Introduction to Computers", TMH
3. Hahn, "The Internet complete reference", TMH
4. D.S. Yadav, "Foundation of Information Technology", New Age International.
5. T. M. Ramachandran, "Principles and Techniques of Programming", Galgotia Publications.
6. R. G. Dromey, "How to Solve it by Computers", PHI

ES-115 FUNDAMENTALS OF ENVIRONMENTAL SCIENCE

w.e.f. Session 2016-17

L T P
3 1 0

Unit-I

Environment its components & Segments, Physical, Chemical and biological study of Environment, Multidisciplinary nature of Environmental studies, Concept of sustainable development & Sustainable life styles. Public awareness & Environmental movements like Chipko, Silent valley, Narmada Bachao Andolan.

Natural resources:

Renewable and non-renewable resources: Natural resources and associated problems.

a. Forest Resources: Use and over exploitation, deforestation, case studies.

b. Water Resources: Use and over utilization of surface and ground water, conflicts over water, dams- benefits and problems.

c. Mineral Resources: Use and exploitation, environmental effects of extracting and using minerals resources, case studies.

d. Food Resources: World food problems, effects of modern agriculture, fertilizer -pesticide problems, Water-logging, Salinity, case studies.

e. Energy Resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources, case studies.

f. Land Resources: Land degradation, Soil erosion and desertification. Role of an individual in conservation of natural resources [10]

Unit-II

Ecosystems

- Concept of an Ecosystem.
 - Structure and Function of an Ecosystem.
 - Producer Consumer and decomposers.
 - Energy flow in the Ecosystem.
 - Ecological Succession.
 - Food chains, Food webs and Ecological Pyramids.
 - Introduction, types, characteristics features ,structure and function of the following ecosystem:
 - a- Terrestrial Ecosystem
 - b- Aquatic Ecosystem
- [8]

Unit-III

Biodiversity and its conservation

- i. Introduction - Definition: Genetic, Species and Ecosystem diversity.
 - Bio-Geographical classification of India,
 - Value of Bio-diversity: Consumptive use, productive use, Social, ethical, aesthetic and option values
 - Biodiversity at Global, National & Local levels.
 - India as a Mega Diversity Nation.
 - Hotspots of Biodiversity
 - Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts
 - Endangered and endemic species of India

- Conservation of Biodiversity: In-situ and Ex-situ conservation of biodiversity. [8]

Unit-IV

Environmental Pollution

Definition

- i. Causes, effects and control measures of
 - a) Air Pollution
 - b) Water Pollution
 - c) Soil Pollution
 - d) Noise Pollution
- Solid Waste Management: Causes, effects and control measures of urban and Industrial Wastes.
- Disaster Management: floods, earthquake, cyclones and landslides. [8]

Unit-V

Social Issues and the Environment

- From unsustainable development to sustainable development
- Urban problems related to Energy
- Water conservation, Rain water Harvesting, Watershed management
- Resettlement and Rehabilitation of people; its problems and concerns, case studies.
- Environmental ethics: issues and possible solutions
- Green house effect and global Warming, effects of acid Rain and their remedial measures and ozone Layer depletion.
- **Ill-effects of fire works**
- Environment protection Act, Air (prevention and control of Pollution) Act, Water (prevention and control of Pollution) Act, wildlife protection Act, Forest conservation Act, Issues involved in Enforcement of Environmental Legislation, case studies.

Human Population and the Environment

- Population growth variation among nations, Population Explosion, Family welfare programme,
- Environment and Human Health,
- Value education
- HIV/AIDS, Women and Child welfare

Suggested field work

Visit to local area to document environment assets river/ forest/ grassland/ hill/mountain, visit to local polluted site urban/ rural/ industrial/ agricultural, study of common plants, insects, birds, study of simple ecosystems pond river, hill slopes etc. [6]

REFERENCES

1. Agarwal, K.C. 2001 Environmental; Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mappin Pub. Pvt. Ltd., Ahmedabad-380, India.
3. Brunner R.C. 1989. Hazardous waste incineration, Mc Graw Hill.

4. Clark R.S. Marine Pollution, Clarendon Press Oxford (TB).
5. Cunningham W.P.2001.Cooper, T.H. Gorhani, E & Hepworth, Environmental encyclopedia, Jaicob Publication House, Mumbai.
6. De. A.K. Environmental chemistry Willey Eastern Limited.
7. Down to Earth, Centre for Science and Environment(R).
8. Glick, H.P.1993 water in crisis, Pacific Institute for studies in dev, Environment & security, Stockholm Env, Institute, Oxford Univ, Press 473 p.
9. Hawkins R .E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay.
10. Heywood, V.H. & Watson, R. T.1995.Global biodiversity Assessment. Cambridge Univ.Press 1140 p.
11. Jadhve, H. and Bhosale, V. M. 1995 Environmental protection and laws, Himalaya pub, house, Delhi.284 p.
12. Mckinnery, M.L. and School, R. M.1996 Environmental science systems and solutions, web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno Science Pub (TM)
14. Miller T.G. Jr, Environmental Ecology, W. B. Saunders Co.USA,574 p. 16
15. Odum,E.P.1997.Fundamental chemistry, Goel Pub House Meerut.
15. Survey of the Environment, The Hindu (M).
16. Sharma B.K.2001.Environmental Chemistry, Goel Pub .House Meerut.

CA103 C PROGRAMMING LAB

w.e.f. Session 2015-2016

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1. Write C program to find largest of three integers.
2. Write C program to find factorial of an integer.
3. Write C program to check whether the given string is palindrome or not.
4. Write C program to find
 - i. Sum of Digits of an integer
 - ii. Product of digits of an integer
5. Write C program to find whether the given integer is
 - i. A prime number
 - ii. An Armstrong number
6. Write C program for Pascal triangle
7. Write C program to find sum and average of n integers using linear array
8. Write C program to perform addition, multiplication, transpose on matrices.
9. Write C program to find factorial of n by recursion using user defined functions.
10. Write a C program to sort a Linear Array of number by:-
 - i. Bubble Sort
 - ii. Selection Sort
11. Write C program to perform following operations by using user defined functions.
 - ii. Concatenation
 - iii. Reverse
 - iv. String Matching
12. Write C program to find sum of n terms of series
 $n \cdot n^{2/2!} + n \cdot n^{4/4!} + \dots$
13. Write C program to interchange two values using
 - i. Call by value
 - ii. Call by reference
14. Write a C program for searching an integer in a linear array using
 - ii. Linear Search
 - iii. Binary Search
15. Write C program to sort the list of integers using dynamic memory allocation
16. Write C program to display the mark sheet of a student using structure.
17. Write C program to perform following operations on data files
 - i. read from data file
 - ii. write to data file
18. Write C program to copy the content of one file to another file using command line argument.

CA104 COMPUTER APPLICATION LAB

w.e.f. Session 2015-2016

L T P
0 0 3

1. Introduction to Basics of Windows

- i. Basic Windows elements
- ii. File management through Windows
- iii. Use of Pop-up windows & Menu bar
- iv. Using essential accessories
 - a) Notepad
 - b) MS-Paint
 - c) WordPad
 - d) Calculator

2. Introduction to MS-Office

- i. Basic functionality of Microsoft Word
- ii. Creation of Excel sheet with multiple functionality
- iii. Making use of Power Point with different features

3. Introduction to MS-DOS

- i. Internal and External commands
- ii. Autoexec.bat & Config.sys

4. Introduction to Linux

- i. Basic Linux commands

5. Introduction to Internet

- i. E-Mail , Browsing, Searching.

6. Multimedia:

- i. **Flash:** Flash Editor , Panels, Tools ,Saving & Uploading Files ,Utilities, Grouping, Graphic Symbols ,Layers, Alignment, Libraries

7. Desktop Publishing (DTP):

- i. **Page Maker:** Navigating in PageMaker, PageMaker Environment, Elements, Creating a Document. Setup & saving ,Using Text .Importing Graphics,
- ii. **Photo shop:** Basic Photo Editing Tasks. Cropping, Zooming, File size, Editing, Removing a Background, changing Contrast of a picture, File Formats.

LN 152 BASIC PROFESSIONAL COMMUNICATION LAB

w.e.f. Session 2015-2016

L T P
0 0 2

1. Introduction

- Difference between Introduction and Description
- SWOT Analysis

2. Software -I

- Listening exercises
- Pronunciation improvement through self- testing
- Vocabulary improvement through word games

3. Software – II

- Conversational skills
- Exercises based on Language Skills/ Small talk
- Cultural movies

4. Phonetic Alphabet and Phonetic Transcriptions

5. Intonation and Stress

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME

Choice Based Credit System

Bachelor of Computer Application (BCA)

Year Ist, Semester IInd

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem Exam	
				L	T	P	C	UE	TA	Total	ESE	
1.	Foundation	MT114	Mathematics II	3	1	0	4	40	20	60	40	100
2.	Core	CA105	System Analysis and Design	3	1	0	4	40	20	60	40	100
3.	Foundation	LN201	Advanced Professional Communication	3	1	0	4	40	20	60	40	100
4.	Core	CA106	Computer Organization	3	1	0	4	40	20	60	40	100
5.	Core	CA107	Data Structure using C	3	1	0	4	40	20	60	40	100
6.	Core	CA108	Data Structure Lab	0	0	3	2	40	20	60	40	100
7.	Core	CA109	Computer Organization Lab	0	0	3	2	40	20	60	40	100
8.	Foundation	LN153	Advanced Professional Communication Lab	0	0	2	1	40	20	60	40	100
Total				15	5	8	25					800

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **UE** – Unit Exam **TA** – Teacher Assessment
Sessional Total (CA) = Unit Exam + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

MT114 MATHEMATICS-II

w.e.f. Session 2015-2016

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UNIT –I

Partial Differentiation and its Application: Partial Derivatives, Euler's Theorem on Homogeneous function, Total differentiation, Errors, Jacobins, Curve tracing, Expansion of functions of one variable and two variables. [8]

UNIT –II

Ordinary Differential Equation: Order and degree of differential equations, solution of differential equations of first order and first degree variables separable, Linear D.E., Homogenous D.E., Exact D.E., Linear differential equation with constant coefficients: Complementary function, Particular integral, Method of variation of parameters. [8]

UNIT –III

Partial Differential Equation and Geometry: Introduction of partial Differential Equations, Linear partial differential equation of second order with constant coefficients, Classification of P.D.E. to parabolic, Elliptic and hyperbolic with examples, Straight lines, Circle, Parabola, Ellipse, Hyperbola in two dimensions. [8]

UNIT –IV

Probability and Distributions: Definition of probability, Elementary properties, Conditional Probability, Baye's Theorems (without proof), Binomial Distribution, Poisson Distribution and Normal Distribution. [8]

UNIT –V

Statistics: Measures of central Tendency – Mean, Median, Mode, Standard deviation and Variance, correlation – Karl Pearsons correlation coefficients, Rank correlation coefficients, Regression lines, Properties of regression coefficients. [8]

REFERENCES:

1. Differential equation by Gupta, Malik and Mittal Pragati Prakashan.
2. Probability theory and random process by S.P. Eugene Xavier, S. Chand & company Pvt. Ltd.
3. Elements of partial Differential Equation by Sneddon McGraw Hill.
4. Mathematics and statistics by Ajay Goyal, Taxman Allied Service Pvt. Ltd.
5. Engineering Mathematics – II by H.K. Dass, S. Chand & company Pvt. Ltd.

CA105 SYSTEM ANALYSIS AND DESIGN

w.e.f. Session 2015-2016

L T P
3 1 0

UNIT-I

System Concepts and Information Systems Environment: The System Concept: Definition, Characteristics of System, Elements of a System, Open and Closed System, Formal and Informal Information Systems, Computer based Information Systems, Management Information System, Decision Support System, General Business Knowledge, and Interpersonal Communicational System.

The System Development Life Cycle: Feasibility Study, Analysis, Design, Implementation, Post implementation & Maintenance [8]

UNIT-II

The Role of the System Analyst: Introduction, Qualities of a System analyst, Roles of a System Analyst

System Planning & Initial Investigation: Strategies for Determining Information Requirement, Problem Definition & Project initiation, Analysis, Review, Observations.

Information Gathering: Types of Information, Information gathering tools, the art of Interviewing, Arranging the Interview, Guides to a Successful Interview, Types of Interviews and Questionnaires. [8]

UNIT-III

The Tools of Structured Analysis: The Data Flow Diagram (DFD), Data Dictionary, Decision Trees and Structured English.

Feasibility Study: Feasibility Considerations, Steps in Feasibility Analysis, Feasibility Report.

Cost/Benefit Analysis: Cost/Benefit Categories, Procedure for Cost/Benefit Determination. [8]

UNIT-IV

The Process and Stages of System Design: Logical & physical Design, Design Methodologies, Structured Design, Functional Decomposition, Structured Walkthrough, Processing Control & Data Validation, Audit Trail & Documentation Control.

Input/output and Forms Design: Input Design, CRT Screen Design, Output Design, Requirements of Form Design, Types of Form Design. [8]

UNIT-V

System Testing and Quality Assurance: Introduction to System testing, Types of System Testing, Quality Assurance Goals in the System Life Cycle.

Hardware & Software Selection and Maintenance: The computer industry, Software industry, A procedure for hardware selection, Major phases in selection, Criteria for software selection. [8]

REFERENCES:

1. Elis Awad, "System Analysis & Design", Galgotia Pub.
2. Jeffrey A. Hoffer; Joey F. George; Joseph S. Valacich," Modern Systems Analysis and Design", Prentice Hall, Sixth Edition 2011, ISBN-10: 0-13-608821-X

LN 201 ADVANCED PROFESSIONAL COMMUNICATION

w.e.f. Session 2015-2016

L T P
3 1 0

UNIT-I

Reading & Listening Comprehension:

Ways to improve the Speed & Efficiency of Reading, Importance of Skim Reading, Note Making, Linear Note- Making & Patterned Note- Taking, Listening Skills & Features of Effective Listening, Benefits of Effective Listening. [8]

UNIT-II

Writing Skills:

C V & Resume writing, Job Application letter/Covering letter.

Précis making: Principles of condensation, Rules for writing précis.

Paragraph writing, Development of paragraph [8]

UNIT-III

Group Discussion and Interview Skills:

Group Discussion: Meaning & Significance, How to prepare & practice for GD, Common Pitfalls in a GD.

Seminars: Definition & Conventions of a Seminar.

Interview: Definition, Skills & Techniques, Preparation, Negative Interview Factors & Interview Tips. [8]

UNIT- IV

Presentation Skills:

Presentation strategies: Purpose, Audience and locale, Organizing contents, Audio-Visual aids, Nuances of Delivery, Body language, Voice dynamics. [8]

UNIT-V

Project Work:

At the commencement of the semester, the student would be assigned a topic by the Teacher/Instructor. They will research it & submit a duly documented report of about 20-25 pages by the end of the semester. [8]

REFERENCES:-

1. Raman, Meenakshi & Sharma, Sangeeta, "Technical Communication: Principles and Practice", Oxford University Press-2013
2. Konar, Nira, "Communication Skills For Professionals", PHI Learning Pvt. Ltd -2011
3. Board of Editors, "Written and Spoken Communication in English", University Press-2007
4. Lata , Pushp & Kumar, Sanjay, "Communicate or Collapse :A Handbook of Effective Public Speaking , Group Discussions and Interviews", PHI Learning Pvt. Ltd -2011
5. Duck, Steve & McMahan, David T., "The Basics of Communication : A Relational Perspective", Sage Publication-2012
6. Laws, Anne- Presentations, Orient Black Swan-2011

7. O'Connor, J. D., "Better English Pronunciation", Universal Books Stall-1991
8. Anderson, Marilyn, Nayar, Pramod K. & Sen, Madhuchhanda, "Critical Thinking, Academic Writing and Presentation Skills", Pearson-2009

CA106 COMPUTER ORGANIZATION

w.e.f. Session 2015-2016

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3 1 0

UNIT – I

Digital Logic Circuit:

Number System: Binary, Octal, Hexadecimal, Character codes (BCD, ASCII, EBCDIC), Logic gates, Boolean Algebra, K-map simplification.

Combinational logic design: Half adder, Full adder, Subtractor, Carry look ahead adder, Decoder, Encoder, Multiplexer, De-multiplexer. [8]

UNIT – II

Sequential Circuits:

Flip-Flops, Excitation tables, Flip-Flop input equation, State table, State diagram, Registers, Counters (synchronous and asynchronous), Complements: $(r-1)$'s complement, r 's complement. Fixed point representation, Floating point representation, Gray codes. [8]

UNIT – III

BASIC Organization:

Von Neumann machine (IAS computer), Instruction formats, Instruction cycle, Organization of Central Processing Unit, General Register Organization, Stack Organization, Addressing Modes, Data transfer and manipulation, BUS Architecture, Hard-wired and micro programmed control unit. [8]

UNIT – IV

Memory Organization:

Memory hierarchy, Main Memory, Types of RAM & ROM, Auxiliary memory, Associative memory, Cache memory, Memory mapping (Direct, Associative, Set associative), Virtual memory, Memory management hardware. [8]

UNIT – V

I/O Organization:

Peripheral devices, I/O interface, Synchronous data transfer, Asynchronous data transfer, Strobe control, Handshaking, Mode of Data transfer: Program Driven I/O, Interrupt Driven I/O, Priority interrupt, Direct memory access, Input output processor, Serial communication, Parallel communication. [8]

REFERENCES:-

9. M. Morris Mano, "Computer System Architecture" PHI.
10. B. Ram, "Computer Fundamental Architectures Organization", New Age.
11. Tannenbaum, "Structured Computer Organization", PHI.
12. Willam Stelling, "Computer Organizations Architecture" Pearson Education.

CA107 DATA STRUCTURE USING C

w.e.f. Session 2015-2016

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UNIT – I

Introduction: Introduction to Data Structure, Efficient use of memory, Elementary Data Organization, Structure operations, Time and space complexity of algorithms and asymptotic notations.

Arrays: Array Definition and Representation, Single and Multidimensional Arrays, Address calculation, Application of arrays, Character String in C, Character string operation, Array as Parameters. [8]

UNIT - II

Linked list: Representation and Implementation of Singly Linked List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list and dynamic storage management, Circular Link List, Garbage Collection and Compaction. [7]

UNIT - III

Stacks: Introduction to Stack, Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Linked Representation of Stack, Application of stack: Postfix and Prefix conversions, Evaluation of expressions using stack.

Queues: Introduction to Queue, Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues and De-queue, Priority Queues. [9]

UNIT – IV

Trees: Basic terminology, Binary Trees, Binary tree representation and Traversal, Algebraic Expressions, Complete Binary Tree, Threaded Binary trees, Binary Search Tree (BST), Height balanced tree and various Rotations.

Graph Theory: Terminology & Representations, Traversal- BFS and DFS, Dijkstra’s algorithm for shortest path, Prim’s and kruskal’s Algorithm for Minimal Spanning tree. [9]

UNIT – V

Searching: Sequential search, Binary search, and Hash search, Comparison and analysis.

Sorting: Insertion Sort, Selection Sort, Bubble Sort, Quick Sort, Two Way Merge Sort and Heap Sort. [7]

REFERENCES:

1. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., New Delhi.
2. M. Tenenbaum, “Data Structures using C & C++”, Prentice-Hall of India Pvt. Ltd., New Delhi.

CA108 DATA STRUCTURE LAB

w.e.f. Session 2015-2016

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Write the following program in C :

- Find the Maximum and Minimum value in an array
- Concatenate two strings, without using library function
- Array implementation of Stack and perform Push and Pop operations
- Evaluation of a Postfix expression
- Array implementation of Linear Queue and perform Insertion and Deletion
- Array implementation of Circular Queue and perform Insertion and Deletion
- Implementation of Singly Link List and perform Insertion, Deletion and Traversal
- Implementation of Doubly Link List and perform Insertion, Deletion and Traversal operations
- Implementation of Binary Tree and perform Inorder, Preorder, and Postorder Traversals
- Searching of element in array using Linear Search
- Searching of element in array using Binary Search
- Sorting of elements in array using Bubble Sort

CA109 COMPUTER ORGANIZATION LAB

w.e.f. Session 2015-2016

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- Study and Bread Realization of Logic Gates, K-Map, Flip-Flop equation, Realization of characteristic and excitation table of various Flip Flops
- Implementation of Half Adder, Full Adder and Subtractor.
- Implementation of Ripple Counters and Registers.
- Implementation of Decoder and Encoder circuits.
- Implementation of Multiplexer and De-Multiplexer circuits.
- Study of 8085 and 8086.
- Assembly language Programming for 8086.
 - (i) Addition, Subtraction
 - (ii) Find greatest numbers

LN 153 ADVANCED PROFESSIONAL COMMUNICATION LAB

w.e.f. Session 2015-2016

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1. Framing Questions

- Yes/ No questions
- Wh- questions
- Question tags
- Rhetorical questions

2. Group Discussion and Group Presentation

(Theory and practice sessions, visual aids)

- When does the GD take place?
- What does the GD test?
- Difference between GD and conversation/ debate
- Some Do's and Don'ts of GD

3. Situational Conversation

- Social language
- Emergency situation
- Seeking help
- Inquiries
- Communicating bad news

4. Negotiation

- Common fears about negotiations
- Building Momentum
- Bargaining with more powerful opponents
- Opening Tactics
- Countering your opponents' moves

5. Mock Interview Exercises

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)

Year IInd, Semester IIIrd

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	UE	TA	Total	ESE	
1.	Foundation	MT202	Computer Based Numerical and Statistical Techniques	3	1	0	4	40	20	60	40	100
2.	Elective - I	CA201	Combinatorics and Graph Theory	3	1	0	4	40	20	60	40	100
		CA202	Multimedia System									
3.	Core	CA203	Object Oriented Programming Concepts using C++	3	1	0	4	40	20	60	40	100
4.	Core	CA204	Database Management System	3	1	0	4	40	20	60	40	100
5.	Foundation	BM228	Accounting and Financial Management	3	1	0	4	40	20	60	40	100
6.	Core	CA205	Mini Project	0	0	3	2	40	20	60	40	100
7.	Core	CA206	C++ Lab	0	0	3	2	40	20	60	40	100
8.	Core	CA207	DBMS Lab	0	0	2	1	40	20	60	40	100
Total				15	5	8	25					800

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **UE** – Unit Exam **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

MT202 COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

w.e.f. Session 2016-17

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UNIT-I

Error and Computer Arithmetic: Error and their analysis, Normalized Floating point arithmetic.

Algebraic and Transcendental equations: Bisection method, Iteration method, False position method, Newton-Raphson method, Rate of convergence of methods, Solutions of simultaneous equations by Gauss Seidel method. [8]

UNIT-II

Finite Differences: Difference operators, Difference tables, Relation between operators, Missing term techniques, Factorial polynomials.

Interpolation for Equal Intervals: Newton's forward and backward formula, Gauss forward and backward formula, Stirling's formula, Bessel's formula.

Interpolation for Unequal Intervals: Divided difference, Newton's divided difference formula, Lagrange's Interpolation formula. [10]

UNIT-III

Numerical Differentiation and Integration: Numerical differentiation, Numerical integration by Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Boole's rule, Weddle's rule, Euler-Maclaurin's formula. [8]

UNIT-IV

Solution of Differential Equations: Taylor's series method, Euler's method, Modified Euler's method, Runge-Kutta Method.

Curve Fitting: Method of least squares, Fitting of straight lines, Second degree parabola. [7]

UNIT-V

Time Series and Forecasting: Moving average, Forecasting models and methods.

Testing of Hypothesis: Test of significance, T-test, F-test, Chi-square test, Analysis of Variance. [7]

REFERENCES:

1. Q.S. Ahmad, Zubair Khan and S.A. Khan, "Numerical and Statistical Techniques", Ane Books Pvt. Ltd., New Delhi.
2. S.S. Sastry, "Introductory Method of Numerical Analysis", PHI, New Delhi.
3. P. Kandasamy, "Numerical Methods", S. Chand and Company, New Delhi.
4. Balaguruswamy, "Numerical Methods", T.M.H., New Delhi.
5. Qazi Shoeb Ahmad, M. V. Ismail and S.A.Khan, "Business Mathematics and Statistics", Laxmi Publication, Meerut.

CA201 COMBINATORICS AND GRAPH THEORY

w.e.f. Session 2016-17

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UNIT-I

Permutation, Combination, Permutation groups and application, Probability, Discrete numeric function and generating function, Combinatorial problems, Difference equation. [7]

UNIT-II

Recurrence Relation: Introduction, Linear recurrence relation with constant coefficient, Homogeneous solution, Particular solution, Total solution, Solution by the method of generating function. [7]

UNIT-III

Graphs: Graph, Sub-graphs, Different types of graphs, Basic properties of graphs, Walks, Path and circuits, Connected graphs, Disconnected graphs and component, Euler and Hamiltonian graphs, Various operation on graphs.

Tree: Tree and fundamental circuits, Distance, Diameters, Radius and pendant vertices, Rooted and binary trees, Counting trees, Spanning trees, Finding all spanning trees of a graph and a weighted graph. [9]

UNIT-IV

Cut Sets: Cut-sets and cut vertices, Properties of Cut Set, All cut sets in a graph, Fundamental circuit and cut sets, Connectivity and Separability.

Planar Graphs: Combinatorial and geometric dual, Kuratowski two graphs, Detection of planarity, Some more criterion of planarity, Thickness and Crossings, Vector space of a graph and vectors, Basis vectors, Cut set vector, Circuit vector, Circuit and Cut set verses sub spaces, Orthogonal vector and sub space.

Matrices of Graph: Incidence matrix of graphs, Sub matrices of $A(G)$, Circuit matrix, Cut Set Matrix, Path Matrix, Fundamental circuit matrix and relationship among A_f , B_f , C_f , Range of B_f , Adjacency matrix, Rank nullity theorem. [9]

UNIT-V

Coloring: Coloring and covering, Partitioning of graph, Chromatic number, Chromatic partitioning, Chromatic polynomials, Four color problem.

Directed graph: Directed graph, Types of directed graphs, Directed paths and connectedness, Euler digraph, Trees with directed edges, Fundamental circuit in digraph, Matrices A, B, C of digraph, Adjacency matrix of digraph. [8]

REFERENCES:

1. Deo Narsing, "Graph Theory with applications to engineering and computer science", PHI.
2. John Truss, "Discrete mathematics for Computer Science", TMH.
3. C. L. Liu, "Discrete Mathematics", TMH.
4. Swapan K Sarkar, "Discrete Mathematics", S.Chand Publication.

CA202 MULTIMEDIA SYSTEM

w.e.f. Session 2016-17

L T P
3 1 0

UNIT-I

Introduction: Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work, Convergence of Computer, Communication and Entertainment products.

Stages of Multimedia Projects: Multimedia hardware, Memory & storage devices, Communication devices, Multimedia software's, presentation tools, Tools for object generations, Video, Sound, Image capturing, Authoring tools, Card and page based authoring tools. [8]

UNIT-II

Multimedia Building Blocks: Text, Sound MIDI, Digital Audio, Audio file formats, MIDI under windows environment, Audio & Video Capture. [8]

UNIT-III

Data Compression: Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, Arithmetic Coding, Higher Order Modeling, Finite Context Modeling, Dictionary based Compression, Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio, Loss less & Lossy compression. [8]

UNIT-IV

Speech Compression & Synthesis: Digital Audio concepts, Sampling Variables, Loss less compression of sound, Loss compression & silence compression. [8]

UNIT-V

Images: Multiple monitors, Bitmaps, Vector drawing, Lossy graphic compression, Image file formats, Animations Images standards, JPEG Compression, Zig Zag Coding, Multimedia Database, Content based retrieval for text and images, Video: Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, Recent development in Multimedia. [8]

REFERENCES:

1. Tay Vaughan, "Multimedia, Making IT Work", Osborne McGraw Hill.
2. Buford, "Multimedia Systems", Addison Wesley.
3. Agrawal & Tiwari, "Multimedia Systems", Excel.
4. Mark Nelson, "Data Compression Book", BPB.
5. David Hillman, "Multimedia technology and Applications", Galgotia Publications.
6. Rosch, "Multimedia Bible", Sams Publishing.
7. Sleinreitz, "Multimedia System", Addison Wesley.
8. James E Skuman, "Multimedia in Action", Vikas.

CA203 OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

w.e.f. Session 2016-17

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UNIT-I

Object-Oriented Analysis and Data Modeling: Introduction to Object Oriented Concepts, Object Oriented Analysis Modeling, Data Modeling.

Object-Oriented Design : Origin of Object-Oriented Design, Object Oriented Design Concepts, Object Oriented Design methods, Class and object definition, Refining operations, Program Components and Interfaces, Annotation for Object-Oriented Design, Implementation of Detail Design, An alternative Object-Oriented Design Strategy, Integrating OOD with SA/SD. [8]

UNIT-II

Introduction to OOP and C++: Advantages of OOP, Need of object-oriented programming, Characteristics of object-oriented languages.

C++ Programming Basics: Basic program structure, Input/output using cin/cout, Preprocessor Directives, Comments, Integer, Character, Float data types, Manipulators, Operators, Library functions, Enumerated Data Types. [8]

UNIT-III

Functions: Basic of functions, Passing arguments to and returning values from functions, Reference Arguments, Overloaded functions, Inline functions, Default Arguments, Friend function, Variable and Storage classes, Call by value and Call by reference.

Objects and Classes: Using class and object, Constructors, Destructor, Objects as function arguments. [8]

UNIT-IV

Arrays and Operator Overloading : Array Fundamentals, Arrays as class member data, Arrays of objects, Strings, Overloading Unary and Binary operators, Data conversion, Pitfalls of overloading and Conversion.

Inheritance: Derived class and their constructs, Inheritance levels, Public and Private Inheritance, Overriding member functions. [8]

UNIT-V

Pointers: Pointers with Arrays, Functions, Strings, Pointer to objects, new-delete, Linked-Lists.

Virtual Functions: Virtual, Static function, this pointer.

Error Handling: Try –Catch Block, Finally, Throws. [8]

REFERENCES:

1. Lafore, Rober S, “The Waite’s Group Object Oriented”, TMH.
2. Barkakati, Nabajoti, “Object Oriented Programming in C++”, Prentice Hall of India.
3. E. Balagrusamy, “Object oriented programming in C++”, TMH.

CA204 DATABASE MANAGEMENT SYSTEM

w.e.f. Session 2016-17

L T P
3 1 0

UNIT-I

Introduction to Databases: Advantage of Database System, Database System versus File System, View of Data, Database System Concepts and Architecture: Data Models, Schemas and Instances, Three schema architecture and Data Independence, Database Languages and Interfaces, Classification of Database Management Systems. [8]

UNIT-II

Entity-Relationship Model: Basic Concepts, Constraints, Keys: Primary Key, Super key, Candidate key, Entity Types, Entity Sets, Design issues, Entity-Relationship Diagram, Relations, Relationship types, Roles and Structural Constraints, Weak Entity sets, Extended ER Features, Design of E-R Database Schema, Reduction of an E-R Schema to tables. [8]

UNIT-III

Relational Model and Constraints: Relational model Concepts, Structure of Relational Databases, Constraints: Entity integrity, Referential Integrity, Domain Constraints, Assertions, Triggers, Security and Authorization, Authentication and Encryption.

SQL: Data Definition, Constraints, Schema Changes in SQL, Basic Queries in SQL, More Complex SQL Queries, Insert, Delete and Update Statements in SQL, Views (in SQL), Specifying General Constraints as Assertion, Additional features.

Oracle: Basic Structure of the Oracle System. [8]

UNIT-IV

The Relational Algebra, Tuple Relational Calculus, Data Normalization: Functional dependencies, Normal form concepts and Types: First Normal Form, Second Normal Form, Boyce-Codd Normal form, Third Normal form and Fourth Normal Form. [8]

UNIT-V

Transaction Management and Recovery Techniques: Introduction to Transaction Processing, Transaction Concepts and Properties, Schedules, Serializability of Schedules, Conflict and view serializable schedules, Recovery Concepts, Recovery from Transactions, Introduction to Concurrency Control Techniques. [8]

REFERENCES:

1. Elmasri, Nawathe ,“Fundamentals of Database Systems”, Addison Wesley.
2. Silberschatz, Korth, Sudarshan , “Database System Concepts”, McGrawHill.

BM228 ACCOUNTING AND FINANCIAL MANAGEMENT

w.e.f. Session 2016-17

L T P
3 1 0

UNIT-I

Accounting: Meaning, Objective, Scope and Uses of Accounting, Types of Accounting, Fundamentals of Accounting: Concept and Conventions, Meaning of GAAP and IFRS, Books of Accounts: Journal, Ledger, Trial Balance, Profit and Loss Account and Balance Sheet, Accounting for Cash: Cash Book. [8]

UNIT-II

Financial Management: Meaning, Objective, Importance and Scope of Financial Management, Finance Functions and Various Decisions: Investment Decisions, Finance Decisions, Dividend Decisions, Capital Budgeting Decisions, Analysis of Financial Statement, Ratio Analysis: Liquidity, Solvency, Profitability and Efficiency Ratio, Cost Volume Profit Analysis (Break Even Analysis). [8]

UNIT-III

Cost Accounting: Meaning, Nature, Need, Elements of Cost, Cost Classification and Allocation of Costs, Absorption and Marginal Costing. [8]

UNIT-IV

Budget and Budgetary Control: Budgetary Approach to Financial Planning, Different types of Budgets, Performance Budgeting, Zero Base Budgeting, Capital Budgeting, Role of Capital Budgeting in Risks and Uncertainties. [8]

UNIT-V

Fund Flow Statements: Definition, Meaning and Preparation, Cash Flow Statements: Definition, Meaning and Preparation, Working Capital Management: Concept, Nature, Types and Sources of Working Capital in Business. [8]

REFERENCES:

1. Kulkarni and Satyaprasad , “Financial Management”, Himalaya Publishing House.
2. P.C. Tulsion , “Accountancy”, Tata McGraw Hill.
3. Nand Dhameja and K.S. Sastry, “Finance and Accounting”, Wheeler Publishing.
4. Prof (Dr.) Mansoor Ali, GanpatRai, “Elements and Management Accounting”, New Delhi.

CA205 MINI PROJECT

w.e.f. Session 2016-17

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Mini Project is concerned with papers studied in present and earlier semesters. This project work is expected to follow all the professional guidelines for software development. At the end of the work, project report will be prepared and submitted. Project viva-voce will be conducted by the external examiner. Students in a group of maximum two will work on software project.

Mini Project will be planned and carried out all the way through the semester to understand the importance of various concepts of Database and Front-end.

CA206 C++ LAB
w.e.f. Session 2016-17

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List of practical using C++ language:

1. Program illustrating Classes and Objects.
2. Program illustrating use of Operator Overloading.
3. Program illustrating use of Function Overloading.
4. Program illustrating use of Friend function.
5. Program illustrating Inline function, Static Member functions.
6. Program illustrating use of Constructor and various types of Constructor.
7. Program illustrating various forms of Inheritance.
8. Program illustrating use of Virtual functions.
9. Program illustrating how Exception Handling is done.
10. Program implementing various kinds of Sorting algorithms, Search algorithms.

CA207 DBMS LAB

w.e.f. Session 2016-17

L	T	P
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Programs to be implemented using SQL by Oracle:

1. Creating tables.
2. Insertion, Deletion, Updation and Retrieval of data.
3. Arithmetic operations, Logical operations and Pattern matching.
4. Concept of Grouping (Group by clause, Having Clause).
5. Use Aggregate function in query.
6. Granting permissions (Grant, Revoke).
7. Write commands for Joins, Union and Intersection.
8. Concept of Sub-query.
9. Concept of Data constraints (Unique Key, Primary Key, Foreign Key).
10. Creating Views and Indexes.
11. Introduction to PL/SQL.

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)

Year IInd, Semester IVth

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	UE	TA	Total	ESE	
1.	Elective - II	CA208	Discrete Mathematics	3	1	0	4	40	20	60	40	100
		CA209	Data Compression									
2.	Elective - III	CA210	Software Engineering and Project Management	3	1	0	4	40	20	60	40	100
		CA211	Software Security									
3.	Core	CA212	Computer Architecture and Microprocessor	3	1	0	4	40	20	60	40	100
4.	Core	CA213	Operating System	3	1	0	4	40	20	60	40	100
5.	Core	CA214	JAVA Programming	3	1	0	4	40	20	60	40	100
6.	Core	CA215	Microprocessor Lab	0	0	3	2	40	20	60	40	100
7.	Core	CA216	JAVA Programming Lab	0	0	3	2	40	20	60	40	100
8.	Core	CA217	Seminar	0	0	2	1	40	20	60	40	100
Total				15	5	8	25					800

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **UE** – Unit Exam **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

CA208 DISCRETE MATHEMATICS

w.e.f. Session 2016-17

L	T	P
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UNIT-I

Relation: Relations on sets, Types of relations in a set, Properties of relations, Composition of relations, Representation of relations, Closures of relations.

Function: Types of functions, Composition of functions, Recursively defined function. [7]

UNIT-II

Algebraic Structures: Properties, Semi group, Monoid, Group, Abelian group, Properties of group, Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism, Isomorphism and Automorphism of groups.

Propositional Logic: Proposition, Tautologies, Contradictions, Algebra of Proposition, Logical implication, Logical equivalence, Normal forms, Predicates and Quantifiers. [8]

UNIT-III

Lattices: Ordered set, Posets, Hasse diagram, Hasse diagram of partially ordered set, Consistent enumeration, Isomorphic ordered set, Well ordered set, Introduction to Lattices, Properties of lattices, Bounded lattices, Distributive lattices, and Complemented lattices. [7]

UNIT-IV

Automata: Introduction of the Language, Kleene closure, Arithmetic expressions, Regular expressions, Generalized transition graph, Conversion of regular expression to Finite Automata, Non deterministic finite automata, Deterministic finite automata, Conversion of NFA to DFA, Optimization of DFA.

Finite Automata with output: Moore machine, Mealy machine, Conversions (Moore machine to Mealy machine and vice-versa). [10]

UNIT-V

Non-Regular language: Pumping lemma, Introduction to Pushdown Automata, Introduction to Turing Machine, Introduction to Chomsky Normal Form (CNF), Chomsky Hierarchy. [8]

REFERENCES:

1. Lipschutz, Seymour, "Discrete Mathematics", TMH.
2. Trembley, J.P and R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", TMH.
3. Hopcroft J.E, Ullman J.D., "Introduction to Automata theory, Languages and Computation", Narosa Publishing House.
4. C.L.Liu, "Elements of Discrete Mathematics", McGraw Hill.

CA209 DATA COMPRESSION

w.e.f. Session 2016-17

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3 1 0

UNIT-I:

Introduction to Compression Techniques: Loss less compression, Lossy Compression, Measures of performance, Modeling and coding, Mathematical Preliminaries for Lossless compression.

Introduction to Information Theory and Models: Physical models, Probability models, Markov models. [8]

UNIT-II:

Huffman Coding Algorithms: Minimum variance Huffman codes.

Adaptive Huffman coding: Update procedure, Encoding procedure, Decoding procedure, Applications of Hoffman coding. [8]

UNIT-III:

Arithmetic Coding: Coding a sequence, Generating a Binary code, Comparison of Arithmetic and Huffman coding.

Dictionary Techniques: Introduction, Static Dictionary: Diagram Coding, Adaptive Dictionary: The LZ77 Approach, The LZ78 Approach.

Applications: File Compression, Image Compression

Lossless Image Compression: Multi-resolution Approaches.

Context Based Compression: Dynamic Markov Compression. [8]

UNIT-IV:

Mathematical Preliminaries for Lossy Coding, Distortion criteria, Models.

Scalar Quantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, Non uniform Quantization. [8]

UNIT-V:

Vector Quantization, Advantages of Vector Quantization over Scalar Quantization, The Linde-Buzo-Gray Algorithm, Tree structured Vector Quantizers, Structured Vector Quantizers. [8]

REFERENCES:

1. Khalid Sayood, "Introduction to Data Compression", Morgan Kaufmann Publishers.
2. David Salomon, "Data Compression: The Complete Reference", Springer.
3. Mark Nelson and Jean-loup Gailly, "The Data Compression Book", M&T Books.

CA210 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

w.e.f. Session 2016-17

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UNIT-I

Software Product and SDLC: Software Engineering Fundamentals, Definition of Software Products, Phases of Software Development Life Cycle, Software Development Paradigm, Software Life Cycles Models: Build and Fix Model, Waterfall Model, Prototype Model, Iterative Model, Evolutionary Model, Spiral Model, Software Requirements Analysis and Specification: SRS, Characteristics of SRS. [8]

UNIT-II

Software Design Principles: Software Design, Design Process, Design Principles: Abstraction, Refinement, Modularity, Information Hiding, Modular Design: Effective Modular Design and Functional Independence, Cohesion, Coupling, Top down and Bottom up Strategies, Coding: Coding Standard and Guidelines, Testing: Black Box Testing and White Box Testing. [8]

UNIT-III

Software Configuration Management: Concept of Configuration Management. Software Maintenance: Categories of Maintenance, Software Reliability: Reliability, Reliability Metrics, Quality Concept: Quality Control, Quality Assurance, Software Quality, Scheduling Tools, Time Estimation, Resource Allocation, Differentiate Projects, Programs and Business Process, Elements of Proposal Process. [8]

UNIT-IV

CASE Tools: Relevance of CASE Tool: Building block for CASE Tools, Integrated Case Tool Environment, Generation of CASE Tool, High End and Low End CASE Tools.

Project Management Fundamentals: Definition of Project, Project Specification and Parameters, Principles of Project Management, Project Management Life Cycle, Program Management Plan: Concept, Elements, Planning Issues, Benefits of Program Management. [8]

UNIT-V

Software Project Management, Project Activities: Engineering Task, Management Task, Work Break down Structure: Concept of WBS, Meaning of Product Oriented Deliverable, Features of WBS, Comparison of Functional based vs. product Oriented Deliverability, Resource and Cost Requirements, Software Project Plans, Software Project Estimation, Project Monitoring and Progress Control, Risk Management: Risk Management Plan, Risk Mitigation Strategies, Software Measurement, Project Metrics, Project Audit: Data Collection, Analysis. [8]

REFERENCES:

1. R. Pressman, "Software Engineering", TMH.
2. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa.
3. Rajib Mall, "Fundamental of Software Engineering", PHI.
4. Pankaj Jalote, "Software Project Management in Practice", Person Education.

CA211 SOFTWARE SECURITY

w.e.f. Session 2016-17

L T P
3 1 0

UNIT-I

Security Fundamentals: The Security Problem, Security Problems in Software, Solving the Problem: The Three Pillars of Software Security, Rise of Security Engineering.

Software Security Issue: The Problem, Software Assurance and Software Security, Threats to Software Security, Sources of Software Insecurity, Benefits of Detecting Software Security Defects Early, Managing Secure Software Development. [8]

UNIT-II

Root of Software Problem: A Brief History of Software, Bad Software is Ubiquitous, The Trinity of Problem, Future of Software.

Risk Management Framework: Putting Risk Management into Practice, The Five Stage of Activity, RMF, Applying the RMF, The Importance of Measurement, Risk Management Framework for Software Security. [8]

UNIT-III

Seven Touch Point for Software Security: Seven Terrific Touch Point, Black & White: Two Threads Inextricably Intertwined, Touch Points as Best Practices, Software Security: Multidisciplinary effort, Touch points to success

Secure Software Architecture and Design: Software Security practices for architecture and Design: Architectural Risk Analysis, Software Security Knowledge for Architecture and Design, Security Principles, Security Guidelines, Attack Patterns. [8]

UNIT-IV

Making Software Secure: Defining Properties of Secure Software, Security Properties of Software, Assertion and Specification for Desired Security properties.

Architecture Design Principles: Architectural Level of Design, Architecting with Design Operators, Functional Design Strategies. [8]

UNIT-V

Knowledge for Software Security: Experience, Expertise and Security, Security Knowledge: A Unified View, Security Knowledge and Touch Points, The Department of Homeland Security Build Security in Portal, Knowledge Management: Ongoing, Software Security recent issue.

An Enterprise Software Security Program: The Business Climate, Building Blocks of Change, Building an Improvement Program, Establishing a Metrics Program, Continuous Improvement, COTS and existing applications, Adopting a Secure Development Lifecycle. [8]

REFERENCES:

1. Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, Nancy R. Mead, "Software Security Engineering: A guide for Project Mangers", Addison Wesley Professional.
2. Gary McGraw, "Software Security: Building Security In", Addison Wesley Professional.
3. Mark Dowd, John McDonald, Justin Schuh, "The Art of Software Security Assessment: Identifying and Preventing Software Vulnerabilities", Addison Wesley Professional.

4. Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, Nancy R. Mead, “Software Security Engineering: A guide for Project Mangers”, Addison Wesley Professional.
5. Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, Nancy R. Mead, “Software Security Engineering: A guide for Project Mangers”, Addison Wesley Professional.
6. Clifford Berg, “High Assurance Design: Architecting Secure and Reliable Enterprise Application”, Addison Wesley Professional.
7. Stephen T. Albin, John, “The Art of Software Architecture: Design Methods and Techniques”, Wiley & Sons.

CA212 COMPUTER ARCHITECTURE AND MICROPROCESSOR

w.e.f. Session 2016-17

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UNIT-I

8-bit Microprocessor: Introduction, Pin diagram and internal architecture of 8085 microprocessor, Registers sets.

16-bit Microprocessor: Introduction, Pin diagram and internal architecture of 8086 microprocessor, Registers sets.

Interrupts: Hardware and Software Interrupts. [8]

UNIT-II

Assembly Language Programming and Instructions: Data transfer, Arithmetic operations, Logical operations, Branch operations, Looping counting, Indexing, Programming techniques, Counters and time delays.

Parallel computing: Introduction, Parallelism in Uniprocessor Systems, Parallel computer structures, Architectural classification schemes, Parallel processing applications. [8]

UNIT-III

Pipelining Processing and overlapped parallelism: Principle of Linear Pipelining, Classification of Pipelined Processor, General Pipelined and reservation tables, Interleaved memory organizations, Arithmetic pipelines.

Principles of designing pipelined processors: Pipeline instruction execution, Pre-fetch buffer, Internal forwarding and Register tagging, Hazard detection and resolution. [8]

UNIT-IV

Pipeline scheduling theory: Scheduling problem, Collision vector, State diagram, Pipeline scheduling optimization, Multiple vector task dispatching, Masking and Data routing.

Program partitioning and scheduling: Grain size and Latency, Grain packing and scheduling, Static multiprocessor scheduling.

Program flow mechanism: Control flow vs. Data flow, Demand-driven mechanism, Comparison of flow mechanism. [8]

UNIT-V

SIMD Interconnection network: Static, Dynamic networks, Mesh connected Illiac network, Cube interconnection network, Shuffle-exchange and Omega network.

Parallel Algorithms for Array Processors: SIMD Matrix multiplication, SIMD Fast Fourier transforms. [8]

REFERENCES:

1. Gaonkar, Ramesh S, "Microprocessor Architecture, Programming and Applications with 8085", Penram International Publishing.
2. Ray A K , Bhurchandi K M , "Advanced Microprocessors and Peripherals", TMH.
3. Hall D V , "Microprocessor Interfacing", TMH.
4. Liu and Gibson G A , " Microcomputer System: The 8086/8088 family" ,PHI.
5. Aditya P Mathur, "Introduction to Microprocessor", TMH.
6. M Rafiqzaman, "Microprocessors, Theory and Applications", TMH.
7. Hwang and Briggs, "Computer Architecture and Parallel Processing", TMH.

CA213 OPERATING SYSTEM

w.e.f. Session 2016-17

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UNIT-I

Introduction: Definition and types of Operating systems, Batch Systems, Multiprogramming, Time-Sharing, Parallel, Distributed and Real-Time Systems, Operating System Structure, Operating System Components and Services, System Calls, System Programs, Virtual Machines. [8]

UNIT-II

Process Management: Process Concept, Process Scheduling, Cooperating Processes, Threads, Interprocess Communication, CPU Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Real-Time Scheduling and Algorithm evaluation. [8]

UNIT-III

Process Synchronization And Deadlocks: The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Deadlocks-System Model, Characterization, Deadlock Prevention, Avoidance and Detection, Recovery from Deadlock, Combined approach to Deadlock Handling. [8]

UNIT-IV

Memory Management: Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with Paging, Virtual Memory, Demand Paging and its performance, Page Replacement Algorithms, Allocation of Frames, Thrashing, Page Size and other considerations, Demand Segmentation. [8]

UNIT-V

File Management: File Systems, Secondary Storage Structure, File concept, Access methods, Directory implementation, Efficiency and performance, Recovery.

Disk Management: Disk Structure, Disk scheduling, Disk management, Recovery, Swap-Space Management, Disk Reliability.

Windows NT-Design Principles, System Components, Environmental subsystems, File system, Networking and Program interface.

Introduction to Android Operating System. [8]

REFERENCES:

1. Abraham Siberschatz and Peter Galvin “Operating System Concepts”, Wiley.
2. Milan Milankovic, “Operating Systems, Concept and Design”, McGraw Hill.
3. Harvey M Deital, “Operating System”, Addison Wesley.
4. Tannenbaum, “Operating System”, TMH.

CA214 JAVA PROGRAMMING

w.e.f. Session 2016-17

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UNIT-I

Java Basic : Comparison of C++ and JAVA, JAVA and Internet, JAVA support systems, JAVA environment, JAVA program structure, Tokens, Statements, JVM, Constant and Variables, Data Types, Declaration of variables, Scope of variables, Symbolic constants, Type Casting.

Operators: Arithmetic, Relational, Logical assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions and its evaluation. [8]

UNIT-II

Defining a Class, Adding variables and Methods to classes, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods.

Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control. [8]

UNIT-III

Arrays: One Dimensional and Two Dimensional, Strings, Vectors, Wrapper Classes.

Interface: Defining Interface, Extending Interface, Implementing Interface, Accessing Interface Variable.

Exception Handling: Concepts of Exceptions, Types of Exception, Try and Catch keyword, Nested Try and Catch. [8]

UNIT-IV

Threads: Creating Threads, Extending Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization.

Package: System Packages, Using System Package, Adding a Class to a Package, Hiding Classes. [8]

UNIT-V

Applets: Local and Remote Applets, Writing Applets, Applets life cycle, Creating an executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing parameters to Applets, Aligning the display, HTML Tags and Applets, Getting input from the user. [8]

REFERENCES:

1. E. Balagurusamy, "Programming in Java", TMH Publications.
2. Peter Norton, "Peter Norton Guide to Java Programming", Techmedia Publications.
3. Naughton, Schildt, "The Complete Reference JAVA 2", TMH.
4. Dustin R. Callway, "Inside Servlets", Addison Wesley.

CA215 MICROPROCESSOR LAB

w.e.f. Session 2016-17

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List of practical:

1. Study of 8085 and 8086.
2. Assembly Language programs for 8086
 - (i) Address and Data Transfer.
 - (ii) Addition, Subtraction.
 - (iii) Block transfer.
 - (iv) Find greatest numbers.
 - (v) Find r's and (r-1)'s complements of signed and unsigned number.
 - (vi) Multiplication of two hexadecimal/octal numbers.
 - (vii) Division of two hexadecimal/octal numbers.
3. Rotation control of stepper motor using interface card.

CA216 JAVA PROGRAMMING LAB

w.e.f. Session 2016-17

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List of practical using JAVA language:

1. Program illustrating Classes and Objects.
2. Program illustrating Method Overloading and Method Overriding.
3. Program illustrating concept of Interface.
4. Program illustrating use of Final and Super keyword.
5. Program that illustrates the following
 - a) Creation of simple package.
 - b) Accessing a package.
6. Program for creating multiple threads
 - a) Using Thread class.
 - b) Using Runnable Interface.
7. Program that illustrates the following
 - a) Handling predefined exceptions.
 - b) Handling user defined exceptions.
8. Program to illustrate the concept of Applets.
9. Working with Panel and Layout.
10. Incorporating Graphics.
11. Working with Colors and Fonts.

CA217 SEMINAR
w.e.f. Session 2016-17

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Students are required to select a topic of the relevant field in Computer Application and register it formally. They will be required to prepare relevant presentation as per allotted dates. Students will also be required to submit their work in form of hard and soft copies for purpose of evaluation.

Integral University, Lucknow
Department of Computer Application
STUDY & EVALUATION SCHEME
Choice Based Credit System

Bachelor of Computer Application (BCA)
w.e.f. Session 2017-18

Year IIIrd, Semester VIth

S. No.	Course Category	Subject Code	Name of the Subject	Periods				Evaluation Scheme				Subject Total
								Sessional (CA)			End Sem. Exam	
				L	T	P	C	CT	TA	Total	ESE	
1.	Core	CA313	.NET Framework with VB. NET	3	1	0	4	25	15	40	60	100
2.	Core	CA314	Introduction to Open Source Environment	3	1	0	4	25	15	40	60	100
3.	Core	CA315	Cyber Law and Internet Security	3	1	0	4	25	15	40	60	100
4.	Elective – V			3	1	0	4	25	15	40	60	100
5.	Core	CA321	Project Lab	0	0	6	3	30	30	60	40	100
6.	Core	CA322	Advanced Technology Lab	0	0	2	1	30	30	60	40	100
7.	Core	CA323	Open Source Lab	0	0	2	1	30	30	60	40	100
Total				12	4	10	21					700

L - Lecture **T** – Tutorial **P** – Practical **C** – Credit **CT** – Class Test **TA** – Teacher Assessment
Sessional Total (CA) = Class Test + Teacher Assessment

Subject Total = Sessional Total (CA) + End Semester Examination (ESE)

Elective - V

- CA316 Management Information System
- CA317 E-Governance
- CA318 Fundamentals of E-Commerce
- CA319 ERP Systems
- CA320 AI and Expert Systems

CA313 .NET FRAMEWORK WITH VB .NET

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: CA322

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UNIT-I

Introduction to Microsoft .NET Framework and VB.NET: Overview of Microsoft .NET Framework, The .NET Framework Components, The Common Language Runtime (CLR) Environment, The .NET Framework Class Library. Getting Started with Visual Basic .NET IDE: Toolbars, New Project Dialog Box, Graphical Designers, Code Designers, Intellisense, Object Explorer, Toolbox, The Solution Explorer, The Class View Window, Properties Window, Dynamic Help Window, Server Explorer, Output Window, Command Window. Visual Basic Language Concept: Variables, Constants, Data Types, Operators, Control Structures and Loops. Arrays: Single and Multidimensional Array, Declaring, Dynamic Array. [7]

UNIT-II

Introduction to Windows Common Controls: Working with Form: Properties, Appearance, Behavior, Layout, Windows Style, Methods and Events, Differentiate Procedure Oriented, Object Oriented and Event Driven Programming, InputBox, MessageBox, Working with Common Tool Box Controls: Label and Button, TextBox, NumericUpDown, Check Box, Radio Button, Group Box Control and all important Methods and Events. [9]

UNIT-III

Additional Controls and Menus of Windows: Working with other Controls of Toolbox: Date Time Picker, List Box, Combo Box, Picture Box, Rich Text Box, Progress Bar, Masked Text Box, Link Label, Checked List Box, Scroll Bars, Timer. Working with Menus: Creating Menu, Inserting, Deleting, Assigning Short Cut Keys, Popup Menu. [8]

UNIT-IV

Advanced Features of VB.NET: Dialog Boxes, Open File Dialog, Save File Dialog, Font Dialog, Color Dialog, Print Dialog. **Sub Procedures and Functions:** Declaring, Passing and Returning Arguments, Exiting from it, Pass by Value and Pass by Ref.

Exception Handling: Structured Error Handling (Try, Catch, Finally), Unstructured Error Handling. **Multiple Documents Interface (MDI):** MDI Parent Form and Child Form. [8]

UNIT-V

Inbuilt Functions and Database Access using ADO.NET: Inbuilt Functions, Mathematical Functions, The abs Function, The exp Function, The fix Function, The int Function, The log Function, The rnd Function, String Manipulation, Format Functions.

ADO.NET Object Model: ADO.NET, Data Provider, Dataset, ADO.NET Programming: Creating a Database Application, Connection to Database with Server Explorer, Data Binding, DataGridView, Data Form Wizard, Data Validation, Populating Data in ADO.NET, Browsing Records, Editing, Saving, Adding and Deleting Records using Bounded and Unbounded Controls, Generic Reports using Crystal Report Viewer. [8]

REFERENCES:

1. Deitel and Deitel, "Visual Basic.NET How to Program", Pearson Education.
2. Richard Blair, Mathew Renolds, "Beginning VB.NET 2003", Wrox Publication.
3. Bill Evjen, Billy, Hollis, "Professional VB.NET 2003", 3rd edition, Wrox Publication.
4. Michael Halvorson, "VB.Net", PHI.
5. Daniel Cazzulino, "Beginning Web Programming using VB.NET and Visual Studio .NET", Wrox Press.
6. David Vitter, "Designing VB.NET Application - A Developer's Indispensable Guide to VB.NET", Dreamtech Press.
7. Evangelos Petroustos, "Mastering VB.NET", BPB Publications.
8. Steven Holzner, "VB.NET Programming Black Book", Dreamtech Publications.

CA314 INTRODUCTION TO OPEN SOURCE ENVIRONMENT

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: CA323

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3 1 0

UNIT-I

Introduction to PHP: Introduction, Uses of PHP, Using PHP in Web Application, Using PHP for Database Applications, Using PHP with your File System, Using PHP for System Commands, Understanding the working of PHP, PHP as a General Purpose Language, PHP for the Web, Keeping up with Changes in PHP, PHP 5, Writing PHP Statements, Adding PHP Sections to HTML File, PHP Output Statement, Documenting your Scripts. [8]

UNIT-II

Basics of PHP Script & Working with Data: Understanding Data Types, Performing Arithmetic, Manipulating Characters String, Using Date and Time, Naming Variables, Assigning values to Variable, Removing Variables, Using Constants, Handling Errors.

Storing Data in Group by using Arrays: Introduction, Building Arrays, Assigning values to Arrays, Sorting Arrays, Using value in Arrays, Building Multidimensional Arrays. [8]

UNIT-III

Controlling the Flow Script & Reusing PHP Code :Introduction, Changing the order of Statements Executed, Setting up Condition, Joining Simple Conditions to make Complex Conditions, Using Conditions in Conditional Statements and Loops, Writing if Statements, Building and using Loops, Breaking Loop, Including Files in Scripts, Understanding Store for included Files, Writing Functions, Using Functions in PHP.

Object Oriented Concepts in PHP: Introduction, Understanding Object Oriented Programming, Identifying Objects, Writing Classes, Object Oriented Concepts. [8]

UNIT-IV

Web Application and PHP : Introduction, Understanding Web Security, Displaying Static Pages, Collecting Information from User with HTML Forms, Processing Information received from Users, Passing Information from Page to Page, Using Cookies, Using Hidden Fields in HTML Forms, Using HTTP Session Functions, Adding JavaScript to PHP Scripts, Writing and Reading Flat Files in PHP.

Introduction to CMS (Drupal, Joomla) and PHP Framework (Cake PHP). [8]

UNIT-V

PHP and MySQL: Introduction to MySQL, Effectiveness of MySQL, MySQL Tools, Prerequisites for MySQL Connection, Displaying Queries in Tables, Database Tables, Database Manipulation in MySQL (CREATE, INSERT, UPDATE, DELETE) Operation, SQL Functions. Exchanging Data between PHP and other Programs, Understanding Database supports in PHP, Using PHP to Interact with a Database, PHP/MYSQL Connection, Handling Database-Connection Errors, Validating User Input using JavaScript. [8]

REFERENCES:

1. Vikram Vaswani, "PHP and MySQL", Tata McGraw-Hill, 2005.

2. Ben Forta, "MySQL Crash Course", SAMS, 2006.
3. Tim Converse, Joyce Park and Clark Morgan, "PHP 5 and MySQL", Wiley India Reprint, 2008.
4. Robert Sheldon, Geoff Moes, "Beginning MySQL", Wrox, 2005.
5. Alexis Leon and Mathews Leon, "Database Management Systems", Vikas, 2008.

CA315 CYBER LAW AND INTERNET SECURITY

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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3 1 0

UNIT-I

Fundamentals of E-commerce: Basic of E-Commerce, Types of E-Commerce, Benefits, Advantages and Disadvantages, Impact of E-Commerce on Business. Network Infrastructure for E-Commerce: Internet and Intranet. E-Commerce: Issues, Problems and Prospects, Network Access Equipments, Broadband Telecommunication. [8]

UNIT-II

Internet Security: Security Issues on Web, Importance of Firewall, Components of Firewall, Transaction Security, Emerging Client Server, Security Threats, Network Security, Factors to Consider in Firewall Design, Limitation of Firewalls. [8]

UNIT-III

Encryption: Encryption Techniques, Symmetric Encryption Keys and Data Encryption Standard, Triple Encryption, Asymmetric Encryption Secret Key Encryption, Public and Private Pair Key Encryption, Digital Signatures, Virtual Private Network.

Digital Signatures: Technical Issues, Legal Issues, Electronic Records, Digital Contracts and Requirements of Digital Signature System. [8]

UNIT-IV

Fundamentals of Cyber Law: Jurisprudence of Cyber Law, Object and Scope of the IT Act 2000, Introduction to Indian Cyber Law, Unictral Model Law, ISP Guideline, Intellectual Property Issues and Cyber Space, Indian Perspective, Overview of Intellectual Property related Legislation in India, Patent, Copyright, Trademark Law, Law related to Semiconductor Layout and Design. [8]

UNIT-V

Investigation and Ethics: Cyber Crime, Cyber Jurisdiction, Cyber Crime and Evidence Act, Treatment of Different Countries of Cyber Crime, Ethical Issues in Data and Software Privacy, Plagiarism, Pornography, Tampering Computer Documents, Data Privacy and Protection, Domain Name System, Software Piracy, Issues in Ethical Hacking.

Internet Security Treats: Hacking, Cracking, Sneaking, Virus, Trojan horse, Malicious Code and Logic Bombs, Introduction to Biometric Security and its Challenges, Finger Prints. [8]

REFERENCES:

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
2. Bajaj and Nag, "E-Commerce: The Cutting Edge of Business", TMH.
3. Harish Chander, "Cyber Law and IT Protection", PHI Publication.
4. Merkov, Breithaupt, "Information Security", Pearson Education.
5. Farooq Ahmad, "Cyber Law in India", Pioneer Books.
6. K. K. Singh, Akansha Singh "Information Security and Cyber Law", Umesh Publication.

CA316 MANAGEMENT INFORMATION SYSTEM

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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UNIT-I

Foundation of Information Systems: Introduction to Information System in Business, Fundamentals of Information Systems, Solving Business Problems with Information Systems, Types of Information Systems, Effectiveness and Efficiency Criteria in Information System. [8]

UNIT-II

An Overview of Management Information System: Definition and Concept of a Management Information System, MIS Vs Data Processing, MIS and Decision Support System, MIS and Information Resources Management, End User Computing, Structure of a Management Information system. [8]

UNIT-III

Concepts of Planning and Control: Concept of Organizational Planning, The Planning Process, Computational Support for Planning, Characteristics of Control Process, The Nature of Control in an Organization. [8]

UNIT-IV

Business Applications of Information Technology: Internet and Electronic Commerce, Intranet, Extranet and Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage. [8]

UNIT-V

Managing Information Technology: Enterprise and Global Management, Security and Ethical Challenges, Planning and Implementing Changes.

Advanced Concepts in Information Systems: Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management and Procurement Management. [8]

REFERENCES:

1. Brian, "Management Information System", Tata Mcgraw-Hill Education Pvt. Ltd.
2. Gordon B. Davis and Margrethe H. Olson, "Management Information System", Tata Mcgraw-Hill Education Pvt. Ltd.
3. Brian, "Introduction to Information System", Tata Mcgraw-Hill Education Pvt. Ltd.
4. Murdick, "Information System for Modern Management", PHI Learning Private Limited, Delhi India.
5. Jawadkar, "Management Information System", Tata Mcgraw-Hill Education Pvt. Ltd.

CA317 E-GOVERNANCE

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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UNIT-I

Basic Concept of E-Governance: Meaning of E-Governance, Concept and need of E-Governance, Meaning of Digital India, Overview of E-Governance Framework.

The E-Kranti Framework: Preamble, Role of E-Kranti in Digital India and its Approval, Objectives of E-Kranti, Principles of E-Kranti, Approach and Methodology for Implementing E-Kranti, Implementation Strategy of E-Kranti. [8]

UNIT-II

Policy on Adoption of Open Source Software for Government of India: Objective, Policy Statement, Nature of Compliance, Applicability, How to Comply, Exception, Implementation Mechanism, Review of Policy.

Framework for Adoption of Open Source Software in E-Governance Systems: Metadata, Scope and Applicability, OSS Current Scenario, Factors Influencing the Adoption of OSS, Impact of Adoption of OSS, Types of OSS Support Models, OSS Licenses, Security Aspects, Unified Software Development, Rapid Application Development, Localization and OSS, Device Driver, Procurement Guidelines, Stages for Induction of OSS Solution, Proposed Ecosystem. [8]

UNIT-III

Policy on Open Application Programming Interfaces (APIs) for Government of India: Objectives and Definition, Policy Statement, Nature of Compliances, Applicability, Implementation Mechanism, Review of Policy.

Email Policy of Government of India: Objectives, Roles Specified for Implementation of the Policy, Basic Requirements of GoI E-mail Service, Responsibilities of User Organizations, Responsibilities of Users, Service Level Agreement, Scrutiny of E-mails/Release of Logs, Security Incident Management Process, Intellectual Property, Enforcement, Deactivation, Exemption, Audit. [8]

UNIT-IV

Policy on Use of IT Resources of Government of India: Scope, Objectives, Roles and Responsibilities, Access to the Network, Monitoring and Privacy, E-mail Access from the Government Network, Access to Social Media Sites, Security Incident Management Process, Intellectual Property, Enforcement, Deactivation, Audit.

Policy on Collaborative Application Development by Opening the Source Code of Government Applications: Metadata, Preamble and Effective Date, Objectives, Applicability, Policy Statement, Responsibilities, Review. [8]

UNIT-V

Application Development & Re-Engineering Guidelines for Cloud Ready Applications:

Introduction, Need for Software Development and Re-Engineering Guidelines, Evolution of eGov App Store, Solution Architecture, Standards, Adoption and Solution Engineering, Integration and Interoperability, Quality Certification, Release Management and Documentation, Solution Sizing and Scalability, Language and Interface, Legacy Integration: Digitization and Migration, Intellectual Property Rights (for Center and State owned Applications). Cloud Enablement of Applications: Application Migration to Cloud, Software as a Service Characteristics, Utilizations of Indian Theory in Public Administration, Raising Competence of Administration: Role of Indian Theory. [8]

REFERENCES:

1. “e-Governance Policy Initiatives under Digital India”, by Department of Electronics and Information Technology, Ministry of Communication and Information Technology, Government of India, <http://negd.gov.in/ebook-e-governance-policy-initiatives-under-digital-india>.
2. M.G. Gupta and R.K. Tiwari (eds.), Reinventing the Government, IIPA, 1998.
3. Richard Hecks, Implementing and Managing e-Governance, Vistar Publications.
4. Jan Erik Lane, New Public Management, Rout ledges, 2000.
5. Work Bank Report, Good Governance, The Business of Government, 1997.
6. IJPA Special No. on “Indian Theory and Public Administration”, July-September, 2000.
7. IJPA Special No. on “Towards Good Governance”, July-September, 2000.
8. Articles on Indian Theory, e-Governance and Good governance for IJPA, ISDA Journal and Administrative Change.

CA318 FUNDAMENTALS OF E-COMMERCE

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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UNIT-I

E-Business and E-Commerce: Introduction, Potential Benefits, Limitations, Classifications, Impact of E-Commerce on Business Models. E-Commerce Applications: Entertainment, E-Marketing, E-Advertising, Search Engines, E-Banking, Mobile Commerce, Online Trading, E-Learning, E-Shopping, Information Superhighway. [8]

UNIT-II

Architecture Framework of E-Commerce: Application Services, Brokerage and Data Management, Interface Layers, Secure Messaging, Middleware Services and Network Infrastructure. Security Protocols: Open Systems Interconnection (OSI), TCP/IP, FTP, HTTP, SMTP, S-HTTP, SSL, NNTP. Messaging Protocols: Basic Mail Protocol, Security Enhanced Mail Protocol, Web Security Issues, Encryption Techniques: Symmetric and Asymmetric. [8]

UNIT-III

Consumer Oriented E-Commerce Applications, Mercantile Process Model: Consumers Perspective and Merchant's Perspective. Electronic Payment Systems: Advantages and Risks, Types of Payment System (Credit Cards, E-Cash, Smart-Cards), etc. [8]

UNIT-IV

Electronic Data Interchange: EDI Architecture, EDI Standards, Non EDI System, Partial EDI System, Fully Integrated EDI System, Prerequisites for EDI. Issues of EDI: Legal Issues, Security Issues, Privacy Issues, Fundamentals of Financial Electronic Data Interchange, Taxation Rules in the E-Commerce. [8]

UNIT-V

Digital Marketing: Search Engines, Directories, Registrations, Solicited Targeted E-mails, Interactive Sites, Banners, Advertising, Spam Mails, E-mail, Chain Letters. Applications of 5P's (Product, Price, Place, Promotion, People). E-Advertising Techniques: Banners, Sponsorships, Portals, Online Coupons, Digital Assets of Company. [8]

REFERENCES:

1. David Whiteley, "E-Commerce", Tata McGraw Hill, 2000.
2. Greenstein and Feinman, "Electronic Commerce – Security: Risk Management & Control", McGraw-Hill, 1999.
3. Ravi Kalakota and A.B. Whinston, "Frontiers of Electronic Commerce", Pearson Education, 2005.
4. Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education, 2000.
5. Henry Chan, Raymond Lee, Elizabeth Chang, "E-commerce: Fundamentals and Applications", Wiley, 2001.

CA319 ERP SYSTEMS

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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3 1 0

UNIT-I

Introduction to ERP: Common Myths, Advantages, Basic Concepts, Risks and Benefits.

Evolution of ERP: Material Requirement Planning, Manufacturing Resource Planning, ERP, e-ERP.

ERP and Related Technologies: Business Process Reengineering (BPR), Data Warehousing, Data Mining, Online Analytical Processing (OLAP), Online Transaction Processing (OLTP), Supply Chain Management (SCM) and Customer Relationship Management (CRM). [10]

UNIT-II

ERP Marketplace and Marketplace Dynamics: Market Overview, Marketplace Dynamics, Changing ERP Market, Functional Modules.

ERP Implementation Basics: Technological, Operational, and Business reasons for Implementing ERP, Implementation Challenges, Implementation Life Cycle, Package Selection. [8]

UNIT- III

ERP Transition Strategies: Big Bang Strategy, Phased Implementation, Parallel Implementation, Process Line Transition Strategy, Hybrid Transition Strategy.

ERP Implementation Process: Implementation Methodologies, Implementation Plan, Risk Assessment, ERP Project Teams, Implementation Vendors Evaluation Criterion. [8]

UNIT- IV

Success and Failure Factors of an ERP Implementation: Success Factors, Failure Factors.

ERP Operation and Maintenance: After Going Live, Ongoing Implementation Efforts, Upgrading Vs New Software, Operation and Maintenance of the ERP System, ERP Maintenance Phase, Maximizing the ERP System. [8]

UNIT- V

Emerging Trends in ERP: Supply Chain Integration, The E-Business Process Model, Components of E-Business Supply Chain, Future of ERP, Faster Implementation Methodologies, Customization Tools, Business Models, Challenges of E-Commerce.

Commonly Used ERP Packages: Tally ERP, TCS-ION, SAP. [6]

REFERENCES:

1. Lexis Leon, "Enterprise Resource Planning", TMH.
2. Brady, Manu, Wegner, "Enterprise Resource Planning", TMH.
3. V.K Garg, N.K. Venkitakrishnan, "ERP Ware: ERP Implementation Framework", Prentice Hall of India.

CA320 AI AND EXPERT SYSTEMS

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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3 1 0

UNIT-I

Overview of AI: Definition of AI, The AI Problems, Application of AI, Water Jug Problem, Defining the Problem as a State Space Search, Problem Characteristics, Production Systems, Control Strategies, Forward and Backward Chaining. [8]

UNIT-II

Search Techniques: Depth First Search, Breadth First Search, Depth Limited Search, Iterative Deepening First Search, Hill Climbing, Best First Search and A* Algorithm, OR Graphs, Problem Reduction, AO* Algorithm, Constraint Satisfaction Problems. [8]

UNIT-III

Knowledge Representation: Approach to Knowledge Representation, Issues in Knowledge Representation, First Order Predicate Logic, Horn's Clauses, Conversion to Clausal Form, Resolution Principle in Propositional Logic, Semantic Networks, Frame Structure. [8]

UNIT-IV

Introduction to Functional Programming Language: Introduction to LISP and its Syntax, Numeric Function, Basic List Manipulation Function, Input/ Output and Local Variables, Recursion Function, Property of List, Arrays. [8]

UNIT-V

Expert Systems: Introduction to Expert Systems, Rule Based System Architecture, Knowledge Acquisition and Validation, Expert System Shells.

Case Studies: MYCIN [8]

REFERENCES:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill.
2. Dan W.Patterson, "Introduction to Artificial Intelligence and Expert Systems", Prentice Hall of India.
3. Nils J.Nilsson, "Principles of Artificial Intelligence", Narosa Publishing house.
4. Stuart Rusell, Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Edition 2.

CA321 PROJECT LAB

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: NONE

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Students are required to carry out the work ahead of the previous semester and build their final year project as per schedule. The final evaluation will be based on the application developed. Students will be required to submit their original work in the form of hard and soft copies as well as make presentations for their examination.

CA322 ADVANCED TECHNOLOGY LAB

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: CA313

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1. Observe and Draw Visual .NET IDE layout and hands on practice to create, save and open the project.
2. Write, test and debug at least five loop, array and operator based VB.NET programs.
3. Design forms and write, test and debug programs to test its various properties, methods, and events.
4. Write, test and debug program to test inputbox and message box.
5. Write, test and debug applications to use textbox, label, and button.
6. Write, test and debug applications to use radio button, checkbox, numericupdown and group box controls.
7. Write, test and debug application using datetimepicker, listbox, combo box, picture box.
8. Write, test and debug application using rich text box, progress bar, masked text box, link label.
9. Write, test and debug application using checked list box, scroll bars, timer.
10. Write, test and debug applications using sub procedures and functions.
11. Write, test and debug applications using math and string manipulation functions.
12. Create and test connection using ADO.NET to view SQL Express Server/Microsoft Access data in textbox controls.
13. Write, test and debug small application to add, edit, search, and delete record in database in unbounded mode i.e. through coding.

CA323 OPEN SOURCE LAB

w.e.f. Session 2017-2018

PREREQUISITE: NONE

COREQUISITE: CA314

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1. Creating simple web pages using PHP.
2. Use of conditional statements in PHP.
3. Use of looping statements in PHP.
4. Creating different types of arrays in PHP.
5. Creating user defined functions in PHP.
6. Creation of files in PHP.
7. File manipulation using PHP.
8. Creation of sessions in PHP.
9. Creation of cookies in PHP.
10. Creating simple applications using PHP.
11. Creating simple table with constraints using MYSQL.
12. Insertion, Updation and Deletion of rows in MYSQL tables.
13. Usage of aggregate functions in MYSQL.
14. Working with set operators using MYSQL.
15. Working with string, numeric and date functions using MYSQL.
16. Database connectivity in PHP with MySQL.
17. Validating Input.
18. Creating simple Application using PHP and MYSQL.