

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 | CT | TA | Total | ESE | |
| 1. | Foundation | MT103 | Mathematics I | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 2. | Foundation | LN104 | Essential Professional Communication | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 3. | Core | CA101 | Programming in C | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 4. | Core | CA102 | Computer Fundamentals and Programming Concepts | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 5. | Foundation | ES115 | Fundamentals of Environmental Science | 3 | 1 | 0 | 4 | 25 | 15 | 40 | 60 | 100 |
| 6. | Core | CA103 | C Programming Lab | 0 | 0 | 3 | 2 | 30 | 30 | 60 | 40 | 100 |
| 7. | Core | CA104 | Computer Application Lab | 0 | 0 | 3 | 2 | 30 | 30 | 60 | 40 | 100 |
| 8. | Foundation | LN152 | Basic Professional Communication Lab | 0 | 0 | 2 | 1 | 30 | 30 | 60 | 40 | 100 |
| Total | | | | 15 | 5 | 8 | 25 | | | | | 800 |

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)

MT103 MATHEMATICS-I

w.e.f. Session 2015-16

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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

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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

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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

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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. Bharaucha 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
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
 $n - n^2/2! + n^4/4! + \dots$
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