



GALGOTIAS UNIVERSITY

Syllabus of

Course Book BCA 2018-21

Name of School: School of Computing Science & Engineering

Department: Computer Application & Information Science

Year: 2018-21

Curriculum

Semester 1

| Sl. No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
|--------------|-------------|--|-----------|----------|----------|-----------|--------------------|-----|-----|-------|
| | | | L | T | P | C | IA | MTE | ETE | Total |
| 1 | CSJP1001 | Basic Japanese -I(Foreign Language) | 2 | 0 | 0 | 2 | 20 | 30 | 50 | 100 |
| 2 | SLBC1001 | Basic English | 0 | 0 | 4 | 2 | 50 | - | 50 | 100 |
| 3 | BCAS1110 | Discrete Mathematics | 3 | 0 | 0 | 4 | 20 | 30 | 50 | 100 |
| 4 | BCAS1120 | Digital Computer Fundamentals | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 5 | BCAS1130 | Introduction to Information Technology | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 6 | BCAS1140 | Programming in C | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 7 | BCAS1141 | Programming Essentials in C Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 8 | BCAS1131 | Information Technology Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| Total | | | 14 | 0 | 8 | 19 | | | | |

Semester II

| Sl. No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
|--------------|-------------|--|-----------|----------|----------|-----------|--------------------|-----|-----|-------|
| | | | L | T | P | C | IA | MTE | ETE | Total |
| 1 | ENVS1001 | Environmental Science | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 2 | SLBC1002 | Professional Communication | 2 | 0 | 2 | 2 | 50 | - | 50 | 100 |
| 3 | BCAS1008 | Data Structures | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 4 | BCAS1009 | Web Technology | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 5 | BCAS1007 | Principle Of Management | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 6 | BCAS1010 | Object Oriented Programming with C++ | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 7 | BCAS1011 | Data Structures Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 8 | BCAS1012 | Web Technology Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 9 | BCAS1013 | Object Oriented Programming with C++ Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| Total | | | 17 | 0 | 8 | 20 | | | | |

Semester III

| Sl No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
|--------------|-------------|---|-----------|----------|----------|-----------|--------------------|-----|-----|-------|
| | | | L | T | P | C | IA | MTE | ETE | Total |
| 1 | BCAS2001 | Computer Architecture | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 2 | BCAS2002 | Database Management System | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 3 | BCAS2003 | JAVA Programming | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 4 | BCAS2004 | Introduction to Algorithm Analysis and Design | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 5 | LLL223 | Logical Skill Building | 3 | 0 | 0 | 2 | 50 | | 50 | 100 |
| 6 | BCAS2006 | Enterprise Resource Planning | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 7 | BCAS2007 | Computer Networking | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 8 | BCAS2008 | Computer Networking Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 9 | BCAS2009 | Java Programming Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 10 | BCAS2010 | Database Management System LAB | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| Total | | | 21 | 0 | 6 | 23 | | | | |

Semester IV

| Sl No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
|-------|-------------|----------------------------------|-----------|----------|-----------|-----------|--------------------|-----|-----|-------|
| | | | L | T | P | C | IA | MTE | ETE | Total |
| 1 | BCAS2015 | Operating System | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 2 | BCAS2012 | Software Engineering | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 3 | BCAS2025 | .Net technology | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 4 | BCAS2021 | Linux Administration | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 5 | BCAS2013 | Graph Theory | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 6 | BCA9001 | PE-1 - AI & ML | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 7 | BCA9003 | iOS, Android APP Development Lab | 0 | 0 | 4 | 2 | 50 | | 50 | 100 |
| 8 | BCAS2026 | .Net technology Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 9 | BCAS2022 | Linux Administration Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 10 | BCA9002 | PE-1- AI & ML using Python Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 11 | LLL245 | Campus-to-Corporate | 0 | 0 | 4 | 2 | 50 | | 50 | 100 |
| | | Total | 18 | 0 | 14 | 23 | | | | |

Semester V

| Sl No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
|-------|-------------|--|-----------|----------|-----------|-----------|--------------------|----|-----|-------|
| | | | L | T | P | C | IA | | ETE | Total |
| 1 | BCAS3001 | Big Data Computing | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 2 | BCAS3003 | Computer Graphics | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 3 | BCAS3004 | E-Commerce | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 4 | BCAS3006 | Software Project Management | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 5 | BCAS3010 | Elective-II - Network Security | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 6 | BCAS3005 | Computer Graphics Lab | 0 | 0 | 2 | 1 | 70 | | 30 | 100 |
| 7 | BCAS3011 | Elective II lab - Network Security Lab | 0 | 0 | 2 | 1 | 70 | | 30 | 100 |
| 8 | BCAS9991 | Project-I | 0 | 0 | 8 | 4 | 50 | | 50 | 100 |
| | | Total | 15 | 0 | 12 | 21 | | | | |

Semester VI

| Sl No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
|-------|-------------|--------------------|----------|----------|-----------|-----------|--------------------|-----|-----|-------|
| | | | L | T | P | C | IA | MTE | ETE | Total |
| 1 | BCAS9999 | Project Work-2 | 0 | 3 | 24 | 15 | 50 | | 50 | 100 |
| | | Total | 0 | 3 | 24 | 15 | | | | |

List of Electives

| Sl No | CourseCode | Name of the Electives | | | | | Assessment Pattern | | | |
|-------|------------|--|----------|----------|----------|----------|--------------------|-----|-----|-------|
| | | | L | T | P | C | IA | MTE | ETE | Total |
| | | Elective-I(Any one) | | | | | | | | |
| 1 | BCAS2028 | Advance DBMS | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 2 | BCAS2029 | Advance DBMS Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 3 | BCAS2030 | Programming essentials in Python | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 4 | BCAS2031 | Python programming language Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 5 | BCA277 | Linux Administration | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 6 | BCA257 | Linux Administration Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 7 | BCAS9001 | PE-1 - AI & ML using Python(Elective) (11) | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 8 | BCAS9002 | PE-1 - AI & ML using Python Lab(Elective) | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| | | Elective -II (Any one) | L | T | P | C | | | | |
| 1 | BCA363 | Multimedia System | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 2 | BCA343 | Multimedia System Lab | 0 | 0 | 2 | 1 | 70 | | 30 | 100 |
| 3 | BCAS3010 | Network Security | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 4 | BCAS3011 | Network Security Lab | 0 | 0 | 2 | 1 | 70 | | 30 | 100 |
| 7 | BCA 362 | Ad. Computer Network | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 8 | BCA 361 | Connecting Networks | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |

BCA-1st Semester

Detail Syllabus

| Semester 1 | | | | | | | | | | |
|------------|-------------|--|-----------|----------|----------|-----------|--------------------|-----|-----|-------|
| Sl. No | Course Code | Name of the Course | | | | | Assessment Pattern | | | |
| | | | L | T | P | C | IA | MTE | ETE | Total |
| 1 | CSJP1001 | Basic Japanese -I(Foreign Language) | 2 | 0 | 0 | 2 | 20 | 30 | 50 | 100 |
| 2 | SLBC1001 | Basic English | 0 | 0 | 4 | 2 | 50 | - | 50 | 100 |
| 3 | BCAS1110 | Discrete Mathematics | 3 | 0 | 0 | 4 | 20 | 30 | 50 | 100 |
| 4 | BCAS1120 | Digital Computer Fundamentals | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 5 | BCAS1130 | Introduction to Information Technology | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 6 | BCAS1140 | Programming in C | 3 | 0 | 0 | 3 | 20 | 30 | 50 | 100 |
| 7 | BCAS1141 | Programming Essentials in C Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| 8 | BCAS1131 | Information Technology Lab | 0 | 0 | 2 | 1 | 50 | | 50 | 100 |
| | | Total | 14 | 0 | 8 | 19 | | | | |

| | | | | | |
|------------------------------|--------------------------|---|---|---|---|
| Course Code: CSJP1001 | JAPANESE-I | L | T | P | C |
| Version No. 01 | Date of Approval: | 0 | 0 | 2 | 1 |
| Prerequisite/Exposure | | | | | |
| Co-requisites | | | | | |

Course Description

Knowledge of Japanese Language is essential and valuable in the field of all engineering streams like electrical, electronics, mechanical and civil. Knowledge of Japanese will help engineering students to widen their horizons and will open up new avenues for higher education in Japan. Foreign Language Teaching will also make the students multi-disciplinary and not focusing only on engineering subjects. Thus, it is the stepping stone in the process of creating professionals with a global outlook and outreach. In a globalized world, understanding of other cultures constitutes an important component of soft skills. This can be enhanced by foreign language teaching. This will also promote an interdisciplinary approach in students.

Course Objectives

1. This course attempts to give the students a working knowledge of Japanese Language with emphasis on communicative competence.
2. This course will focus on listening and speaking.
3. Basic Japanese sentences will be introduced and practiced.
4. Sufficient vocabulary will be given to the students to converse in different situations using the language patterns taught.
5. Introduction to Japanese history, politics, culture and society will be given.
6. This course aims to give the students an interdisciplinary approach in order to compete in the globalized world.
7. This course will expose the students to a new culture which promotes respect for the 'others' and inculcates tolerance.

Course Pre-requisite : **None**

Course Outcomes

1. On the completion of the course, the students will be able to understand simple Japanese and answer question in Japanese.
2. They will be able to introduce themselves in Japanese and talk on simple topics such as 'My family', 'My city' etc.
3. They will have a basic understanding of Japanese society and culture.

Prescribed Texts

1. Shokyuu Nihongo, Japanese Language Center for International Students, Tokyo University of foreign Studies, Japan.
2. Nihongo Kana nyuu mon, Japan foundation, Japan.
3. Shin Nihongo no KISO-1, AOTS, 3A Corporation, Japan.

Additional References

1. Random House Japanese-English Dictionary
2. Japanese for Busy people, Video CD , AJALT, Japan.

| COMMUNICATIVE JAPANESE-I (JAPL-1001) | | | L | T | P | C |
|---|---------------|---|---------------------|----------|-----------------------------|----------|
| | | | 0 | 0 | 2 | 1 |
| Session No | Module | Topics | Core Reading | | Additional Reference | |
| 1 – 4 | 1 | Introduction to Japanese syllabary, Vowels and Consonants, Romaji, Hiragana, Katakana, Japanese Numerals, Demonstrative pronouns, Greetings, Set phrases – One gaishimasu – Sumimasen, wakarimashita Parts of body (look and learn) | | | | |
| 5-8 | 2 | 1.Hajimemashite. 2.Hon no Kimochi. | LESSON 1 & 2 | | | |
| 9-12 | 3 | 3.kore wo kudasai. 4.Sochira wa nanjikara nanji made desu ka. | LESSON 3 & 4 | | | |
| 13- 16 | 4 | 5.Kooshi en e ikimasu ka. 6.Issho ni ikimasen ka. | LESSON 5 & 6 | | | |

| | | | | | |
|------------------------------|--------------------------|---|---|---|---|
| Course Code: CSJP1001 | JAPANESE-I | L | T | P | C |
| Version No. 01 | Date of Approval: | 0 | 0 | 2 | 1 |
| prerequisite/Exposure | | | | | |
| Co-requisites | | | | | |

COURSE CONTENT

Unit I: Reading Writing Level 1

8 lecture hours

Listening: Identifying the key words
 Reading and Writing: Textual Essay: Advertising
 Letter Writing: Informal letters
 Functional Grammar: Basics of grammar
 Vocabulary: Identifying jumbled letters and framing sentences

Unit II: Reading Writing Level 2

8 lecture hours

Listening: Conversations
 Reading and Writing: Textual Essay: Art of Listening
 Letter Writing: Permission Letters
 Functional Grammar: Tenses
 Vocabulary: Commonly used phrasal verbs.

Unit III: Reading Writing Level 3

8 lecture hours

Listening: Listening to songs and answering multiple choice questions
 Reading and Writing: Textual Essay: An Astrologer's Day
 Letter Writing: To the editor
 Functional Grammar: Active and Passive voice
 Vocabulary: Prefix and Suffix

Unit IV: Laboratory

8 lecture hours

English Master- Exercises 1-10, Cambridge Advanced Learners' Dictionary. **Text Books**

1. Compiled and prepared by English Division, SSH, VIT

Reference Books

- 1 Developing Communication Skills by Krishna Mohan & Meera Banerji
- 2 Communication Skill for you by Dharmendra Mittal

| | | |
|---|---|-----------------|
| SLBC1001 | BASIC ENGLISH | L T P C 2023 |
| Version No. | | |
| Course Prerequisites: | | |
| Objectives: | | |
| <ol style="list-style-type: none"> To read and interpret a variety of written materials to improve students vocabulary and enable them to use the words appropriately in different situations | | |
| Expected Outcome: | | |
| <ol style="list-style-type: none"> To use grammatical devices with care To be able to perform simple and coherent writing | | |
| Module I | Reading Writing Level 1 | |
| Listening: Identifying the key words, Reading and Writing: Textual Essay: Advertising Letter Writing: Informal letters Functional Grammar: Basics of grammar Vocabulary: Identifying jumbled letters and framing sentences | | |
| Module II | Reading Writing Level 2 | |
| Listening: Conversations Reading and Writing: Textual Essay: Art of Listening Letter Writing: Permission Letters Functional Grammar: Tenses Vocabulary: Commonly used phrasal verbs | | |
| Module III | Reading Writing Level 3 | |
| Listening: Listening to songs and answering multiple choice questions Reading and Writing: Textual Essay: An Astrologer's Day Letter Writing: To the editor Functional Grammar: Active and Passive voice Vocabulary: Prefix and Suffix | | |
| Module IV | Laboratory | |
| English Master- Exercises 1-10, Cambridge Advanced Learners' Dictionary | | |
| Text Books | | |
| 1. Compiled and prepared by English Division, SSH, VIT | | |
| References | | |
| <ol style="list-style-type: none"> Developing Communication Skills by Krishna Mohan & Meera Banerji Communication Skill for you by Dharmendra Mittal | | |
| Mode of Evaluation | Assignments/Quizzes/Seminars/CAT/Term-end | |

| | | | | | |
|---------------------------|-----------------------------|-----------|------------|------------|------------|
| Name of The Course | Discrete Mathematics | L | T | P | C |
| Course Code | BCAS1110 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

- This course provides elementary mathematical knowledge and problem solving techniques.
- This course studies the mathematical elements of computer science including propositional logic, predicate logic, combinatory, mathematical induction, recurrence relation, graphs, and Boolean algebra.
- At the end of this course students should be able to understand the concepts and skills of basic operations in discrete mathematics.

Course Outcomes

| | |
|-----|---|
| CO1 | Explain at high levels concepts and implement basic operations in discrete mathematics. |
| CO2 | Perform combinatorial analysis to solve counting problems. |
| CO3 | Develop mathematical models from computation theory to programming languages through combinatory. |
| CO4 | Use mathematical reasoning to comprehend and construct mathematical arguments, graphs. |
| CO5 | Develop techniques for counting, permutations and combinations. |

| | | |
|---|----------------------|---------|
| Unit-1 | MATHEMATICAL LOGIC | 6 hours |
| Introduction, Propositions, Connectives, Truth tables, Tautologies and Contradictions, Equivalences implications, Normal forms, Methods of proof rules of inference for quantified propositions, Mathematical induction. | | |
| Unit-2 | COMBINATORICS | 8 hours |
| Basics of counting, Combinations of permutations, Enumeration of combination and permutation, Pigeonhole principle, Inclusion, Exclusion principle, Ordered and unordered portions. | | |
| Unit-3 | RECURRENCE RELATIONS | 8 hours |
| Generating function of sequences, Calculating coefficients of generating functions, Recurrence relations, solving recurrence relations by substitution and generating functions, Method of characteristic roots, Solution of homogeneous recurrence relations | | |
| Unit-4 | GRAPH THEORY | 8 hours |

| | | |
|--|-----------------------------------|---------|
| Basic concepts of graph theory, Diagraph, Paths, Reachability connectedness, Matrix representation of graphs, Subgraphs, Isomorphisms trees, Properties, Directed tress, Binary trees. | | |
| Unit-5 | BOOLEAN ALGEBRA | 6 hours |
| Post, Hasse diagrams, Lattices, Types of Lattices, Boolean Algebra, Basic theorems, Applications. | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

Text Book (s)

1. Seymour lipschutz, Marc Lars Lipson, Theory and Problems of Discrete Mathematics Third Edition, Schaum’s Outline Series McGRAW-HILL.
2. B. Kolman, R.C. Busby, and S.C. Ross, Discrete Mathematical Structures, PHI
3. Kenneth H. Rosen, Discrete Mathematics and Its Applications, McGraw-Hill

Reference Book (s)

- Swapan Kumar Sarkar, A Textbook of Discrete Mathematics, S.Chand Publication
1. Jean Paul Trembley, R Manohar, Discrete Mathematical Structures with Application to Computer Science, McGraw-Hill
 2. J.L. Mott, A. Kandelad T.P. Baker, Discrete Mathematics for Computer Scientists and Mathematicians, PHI, 2nd Edition, 1999.
 3. Liu and Mohapatra, “Elements of Distcrete Mathematics”, McGraw Hill

| | | | | | |
|---------------------------|---------------------------------------|-----------|------------|------------|------------|
| Name of The Course | Digital Computers Fundamentals | L | T | P | C |
| Course Code | BCAA1120 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti-requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

The purpose of this course is to provide digital computer fundamentals. The main goal of the course is to introduce students to the number system conversion from one base to another, to solve equations using Karnaugh map and Tabulation method, design circuits for binary adder, code converter, multiplexer, arithmetic circuits and accumulator.

Course Outcomes

| | |
|--|---|
| CO1 | Develop an understanding of the number system |
| CO2 | Design the logic gates And solve K-maps Problems. |
| CO3 | Understand the logics of Adder, Multiplexer and encoder-decoder. |
| CO4 | Understand the Flip-flops and application of flip-flops |
| CO5 | Understand Registers and Memory classification. |
| .Unit-1 | Introduction 8 hours |
| Introduction – Converting Numbers from One Base to Another – Complements – Binary Codes – Integrated Circuits – Boolean Algebra – Properties of Boolean Algebra – Boolean Functions – Canonical and Standard Forms | |
| Unit-2 | Logic Gates 8 hours |
| Logic Gates – Karnaugh Map Up to 3 Variables – Don't Care Condition – Sum of Products and Products of Sum Simplification | |
| Unit-3 | Adder – Subtractor 8 hours |
| Adder – Subtractor – Code Converter – Multilevel NAND and NOR Circuits – Binary Parallel Adder – Decimal Adder – Binary Multiplier-Binary Divider-Decoders – Encoder – Multiplexers-Demultiplexer. | |
| Unit-4 | Flip Flops 8 hours |
| Flip Flops – Triggering of Flip Flops – Design of Counters –Ripple Counters. | |
| Unit-5 | Registers 8 hours |
| Registers – Shift Registers –Memory Devices – Introduction,Classification Of Memories, Basic Memory Structure ,RAM,ROM,PLA. | |
| Unit-6 | Advancement & Research 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | |

Text Book (s)

- M. Morris Mano – Digital Logic and Computer Design, 3rd Ed, PHI – 1994.
- A.P. Malvino and D.P. Leach – Digital Principles and Applications – Fourth Edition – Tata McGraw Hill Edition – 1999

| | | | | | |
|---------------------------|---|-----------|------------|------------|------------|
| Name of The Course | Introduction to Information Technology | L | T | P | C |
| Course Code | BCAC1130 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. Provide information about the various computer tools available.
2. Enable the students to understand the role of information technology in various fields.

Course Outcomes

| | |
|------------|--|
| CO1 | Understand the basics of Information System and GPS |
| CO2 | Understand about Computer System, CPU, Microprocessor and I/O. |
| CO3 | Learn about the I/O Devices and storage Media. |
| CO4 | Understand about the Software, word processing, spreadsheets and database Application. |
| CO5 | Understand the Network Application, Tools of multimedia. |
| CO6 | Understand the concept of Multimedia. |

| | | |
|--|---------------------|----------------|
| Unit-1 | Introduction | 6 hours |
| IT an Introduction – Information Systems – Software and Data – IT in Business, Industry, Home, at Play, Education, Training, Entertainment, Arts, Science, Engineering and Maths – Computers in Hiding – Global Positioning System (GPS). | | |
| Unit-2 | Technology | 8 hours |
| Types of Computers – Anatomy of a Computer – Foundations of Modern Information Technology – The Central Processing Unit – How Microprocessors and Memory Chips are Made – Memory – Buses for Input and Output – Communication With Peripherals. | | |
| Unit-3 | Devices | 8 hours |
| I/O Devices – Inputting Text and Graphics – State of the Art – Input and Output – Pointing Devices – Foundations of Modern Output – Display Screens – Printers – Foundations of Modern Storage – Storage Media – Increasing Data Storage Capacity – Backing up your Data – The Smart Card. | | |
| Unit-4 | Interfaces | 8 hours |
| Software – User Interfaces – Application Programs – Operating Systems – Document – Centric Computing – Major Software Issues – Network Computing – Word Processing and Desktop Publishing – Spreadsheet and Database Applications. | | |
| Unit-5 | Networks | 8 hours |
| Network Applications – Foundation of Modem Networks – Local Area Networks – Wide Area Networks – Links Between Networks – Networks: Dial-up Access – High Bandwidth Personal Connections | | |
| Unit-6 | Multimedia | 4 hours |
| Multimedia – Tools of Multimedia – Delivering Multimedia – Multimedia on Web | | |

Text Book (s): D.P. Curtin, K. Foley, K. Sen and C. Morin, Information Technology – The Breaking Wave, TMH Edition – 1999.

Reference Book (s):

1. Sawyer, Williams and Hutchinson, Using Information Technology – Brief Version, McGraw Hill International Edition – 2003.
2. Fundamentals of Information Technology, Alexis Leon & Mathews Leon–Vikas Publishing House Pvt. Ltd. – 1999.

| | | | | | |
|---------------------------|-------------------------|-----------|------------|------------|------------|
| Name of The Course | Programming in C | L | T | P | C |
| Course Code | BCAS1140 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. Introduce the students to the concepts of C programming with emphasis on the following topics Functions, Arrays, Pointers, Structures, Files.
2. Solve problems using the above concepts.

Course Outcomes

| | |
|------------|--|
| CO1 | Understand the working and architecture of 'C' |
| CO2 | Understand when and how to take decisions, to compare and iterate, to simplify the problems. |
| CO3 | Students should be able to implement syntax and logics for development according to the user account, implement algorithmic solutions in a programming language. |
| CO4 | Solve problems of limited scope by writing programs using the concepts taught. |
| CO5 | To allow the student to write their own programs using standard language infrastructure regardless of the hardware or software platform. |

| | | |
|---|---------------------|----------------|
| Unit-1 | Introduction | 8 hours |
| Identifiers - Keywords- Data Types - Access Modifiers - Data Type Conversions - Operators - Conditional Controls - Loop Controls- Input / Output Operations - Character Test Functions | | |
| Unit-2 | Arrays | 8 hours |
| Arrays - One Dimensional Arrays - Two Dimensional Arrays - Multidimensional Arrays - Handling of Character Strings - String - Handling Functions - Table of Strings - enum - Typedef. | | |
| Unit-3 | Functions | 8 hours |
| User Defined Functions - Need for User Defined Functions - Category of Functions - Nesting of Functions - Recursion - Functions with Arrays - Storage Classes - Macros and Preprocessors. | | |
| Unit-4 | Structures | 8 hours |
| Structures - Array of Structures - Arrays within Structures - Structures within Structures - Structures and Functions - Unions - Size of Structures. | | |
| Unit-5 | Pointers | 8 hours |

Pointers - Pointer Variables - Passing Pointers to Functions - Pointers and One Dimensional Array - Dynamic Memory Allocation - Pointers and Multi Dimensional Arrays - Arrays of Pointers - Pointers to Structures – Data files - Opening and Closing a Data file - Creating a Data file - Processing a Data file - Unformatted Data file.

| | | |
|---------------|-----------------------------------|----------------|
| Unit-6 | Advancement & Research | 4 hours |
|---------------|-----------------------------------|----------------|

[Advancement in the course, Research methodologies, research discussion & publication](#)

Text Books

1. B.S. Gottfried - Programming With C - Schaum's Outline Series - Tata McGraw Hill 2nd Edition - 2004.

Reference Books

1. E. Balagurusamy - Programming in ANSI C - Second Edition - Tata McGraw Hill-1999

Text Book (s)

Meenakshi Raman, Prakash Singh, Business Communication, Oxford University Press

Reference Book (s)

| | | | | | |
|---------------------------|--|-----------|------------|------------|------------|
| Name of The Course | Programming Essentials in C Lab | L | T | P | C |
| Course Code | BCAS1141 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

List of Experiments:

1. Write a program to convert temperature from degree centigrade to Fahrenheit. $^{\circ}\text{F} = ^{\circ}\text{C} * 9/5 + 32$
2. Write a program to compute the addition, subtraction, product, quotient and remainder of two given numbers.
3. Write a program to swap the values of two variables.
4. Write a program to compute net amount from the given quantity purchased and rate per quantity. Discount of 10 .is allowed if quantity purchased exceeds 100.
5. Write a program to print the sum of digit of a given number.
6. Write a program to print the Fibonacci series up to a given number.
7. Write a program to print the prime numbers within a given number.
8. Write a program to check a given number is prime or not.
9. Write a program to check whether a no is an Armstrong number.
10. Write a program to determine and print the sum of the following harmonic series for a given value of n $1 + 1/2 + 1/3 + 1/4 + \dots + 1/n$
11. Write a program to print the Floyds triangle


```

1
3
5 6
      
```
12. Write a program to read three integer values from the keyboard and display the output stating that they are the sides of the right angled triangle.
13. Write a program to accept an year from the user and check whether the entered year is a leap year or not.
14. Write a program to print binary equivalent of an integer number.
15. Write a program to print the following pattern (take number of lines as input from the user).


```

***
**
*
      
```
16. Write a program to evaluate the following functions to

$$\text{Sin}(x) = x - x^3/3! + x^5/5! - \dots \& \text{Cos}(x) = x - x^2/2! + x^4/4! - x^6/6! + \dots$$

17. Write a program to find out the length of a given string without using the library function `strlen()`.
18. Write a program to print the reverse of a given string.
19. Write a program to check if a given string is palindrome or not. A string is said to be palindrome if the reverse of the string is equal to the string.
20. Write a program to count the number of vowels in a given string.
21. Write a program for addition of two nxm matrices
22. Write a program for multiplication of two nxm matrices
23. Write a program to compute factorial of a given number using function.
24. Write a function for swapping of two numbers.
25. Write a program for finding factorial of a number using recursion.
26. Write a program to sort an array using Bubble Sort (using function).
27. Write a program to search a key number in an array using Sequential Search Method.(use function)
28. Write a program to accept student details (name,roll, address,phone no)and store them in a file and perform the following operations on it.
 - a. Search b. Add c. Delete d. Modify e. Display

| | | | | | |
|---------------------------|-----------------------------------|-----------|------------|------------|------------|
| Name of The Course | Information Technology Lab | L | T | P | C |
| Course Code | BCAS1131 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

| S.No. | Title of Lab Experiments |
|-------|--|
| 1. | Write a procedure to create a resume. |
| 2. | Write a procedure to create a cover page of a project report. |
| 3. | Write a procedure to create a greeting card. |
| 4. | Write a procedure to create a company letterhead. |
| 5. | Write a procedure to create a simple newsletter. |
| 6. | Write a procedure to create a mail merge letter. |
| 7. | Write a procedure to create a macro and use it in an application. |
| 8. | Write a procedure to create a presentation on basic DOS commands given below: a. a. Dir b. Md c. Cd d. Copy e. Del f. Copy |
| 9. | Write a procedure to create a presentation and add audio to it. |
| 10. | Write a procedure to create a worksheet with 4 columns, enter 10 records and find the sum of all columns |
| 11. | Write a procedure to create a report containing the pay details of the employee. |
| 12. | Write a procedure to create a student result sheet. |
| 13. | Write a procedure to create a simple bar chart to represent the sales of a company for 3 different periods |
| 14. | Write a procedure to create a worksheet importing data from database and calculate sum of all the columns |
| 15. | Write a procedure to create a simple table for result processing. |
| 16. | Write a procedure to create a query table for the result processing table. |
| 17. | Write a procedure to create a form to update/modify the result processing table. |
| 18. | Write a procedure to create a report to print the result sheet and marks card for the result. |

| | | | | | |
|---------------------------|------------------------------|-----------|------------|------------|------------|
| Name of The Course | Environmental Science | L | T | P | C |
| Course Code | ENVS1001 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. **Introduce the fundamentals and abstract concepts of environment studies.**
2. **Learn how concepts of social issues and the environment studies are useful in realistic problem solving.**

Course Outcomes

| | |
|------------|--|
| CO1 | Students will understand the need for eco-balance |
| CO2 | Also, Knowledge on the method of pollution prevention |
| CO3 | Understand the knowledge of Environmental Pollution |
| CO4 | Demonstrate Social Issues and the Environment |
| CO5 | Students able to understand Human Population and the Environment |

| | | |
|---|--|----------------|
| Unit-1 | Environment & Natural Resources | 6 hours |
| Definition, scope, importance, need for public, Natural Resources – forest resources – use, exploitation, deforestation, construction of multipurpose dams – effect on forests, Water resources – use of surface and subsurface water; effect of floods, drought, water conflicts, food resources – food problems, advAnti-age and disadvAnti-age of fertilizers & pesticides, effect on environment, Energy resources – need to develop renewable energy, land resources – Land degradation, landslides, soil erosion, desertification & case studies. | | |
| Unit-2 | Ecology & Bio-Diversity | 8 hours |
| Concept of ecosystem, structure & function of an ecosystem, producers, consumers and decomposers, energy flow, ecological succession, food chains, food webs and ecological pyramids. Bio diversity: Definition, genetic, species and ecosystem diversity, bio-geographical classification of India, hotspots, threats related to habitat loss, poaching of wildlife, man-wildlife conflicts, Conservation of bio-diversity. | | |
| Unit-3 | Environmental Pollution | 8 hours |
| Definition – Causes, pollution effects and control measures of Air, Water, Soil, Marine, Noise, Thermal, Nuclear hazards. Solid `waste management: causes, effects and control measures of urban and industrial wastes, pollution measures, case studies, Disaster management: floods, earthquake, cyclone and landslides. | | |
| Unit-4 | Social Issues and the Environment | 8 hours |

Urban problems related to energy & sustainable development, water conservation, rain water harvesting, watershed management, problems related to rehabilitation – case studies, Wasteland reclamation, Consumerism and waste products - Environment Protection Act, Air, Water, Wildlife, Forest Conservation Act, Environmental legislation and public awareness.

| | | |
|---------------|---|----------------|
| Unit-5 | Human Population and the Environment | 6 hours |
|---------------|---|----------------|

Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV/ AIDS, Women and Child Welfare, Role of Information Technology – Visit to local polluted site / Case Studies.

| | | |
|---------------|-----------------------------------|----------------|
| Unit-6 | Advancement & Research | 4 hours |
|---------------|-----------------------------------|----------------|

Advancement in the course, Research methodologies, research discussion & publication

Text Books

1. Kurian Joseph & R. Nagendran, "Essentials of Environmental Studies", 1st Edition, Pearson Education, 2004.

Reference Books

1. Keerthinarayana & Daniel Yesudian, "Environmental Science and Engineering", 1st Edition, Hi-Tech publications, 2004.
2. Erach Bharucha, "A Text Book for Environmental Studies", Text Book of University Grants Commission, 2004.
3. Metcalf & Eddy, "Wastewater Engineering: Treatment and Reuse", New Delhi, TMH

| | | | | | |
|---------------------------|-----------------------------------|-----------|------------|------------|------------|
| Name of The Course | Professional Communication | L | T | P | C |
| Course Code | SLBC1002 | 0 | 0 | 4 | 2 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 50 | | 50 | 100 |

Course Objectives:

1. Make students understand that both oral & written communications are equally important.
2. The students should be comfortable with both verbal & written communication.

Course Outcomes

| | |
|------------|--|
| CO1 | Students understand the value of business communication, written & presentation skills in professional life. |
| CO2 | Students should be well equipped with business & written communication with effective presentation skills. |
| CO3 | Students understand the Forms of Technical Communication |
| CO4 | Students able to understand presentation strategies |
| CO5 | Understand the fundamentals of human relations |

Text Books

- 1 Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, New Delhi .
- 2 Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press 2007, New Delhi.

Reference Books

- 1 Effective Technical Communication by Barun K. Mitra, Oxford Univ. Press, 2006, New Delhi.
- 2 Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., New Delhi.
- 3 How to Build Better Vocabulary by M.Rosen Blum, Bloomsbury Pub. London.
- 4 Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors; Delhi.
- 5 Developing Communication Skills by Krishna Mohan, Meera Banerji- Macmillan India Ltd. Delhi.
- 6 Manual of Practical Communication by L.U.B. Pandey & R.P. Singh; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, Delhi.

| | | |
|---|--|----------------|
| Unit-1 | Basics of Technical Communication | 6 hours |
| Technical Communication: features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: | | |

| | | |
|--|--|----------------|
| Interpersonal, Organizational, Mass communication; The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Importance of technical communication; Barriers to Communication | | |
| Unit-2 | Constituents of Technical Written Communication | 8 hours |
| Words and Phrases: Word formation. Synonyms and Anti-onyms; Homophones; Select vocabulary of about 500-1000 New words; Requisites of Sentence Construction: Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps. | | |
| Unit-3 | Forms of Technical Communication | 8 hours |
| Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Job application and Resumes. Official Letters: D.O. Letters; Govt. Letters, Letters to Authorities etc. Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance. Technical Paper, Project. Dissertation and Thesis Writing: Features, Methods & Writing. | | |
| Unit-4 | Presentation Strategies | 8 hours |
| Defining Purpose; Audience & Locale; Organizing Contents; Preparing Outline; Audio-visual Aids; Nuances of Delivery; Body Language; Space; Setting Nuances of Voice Dynamics; Time- Dimension | | |
| Unit-5 | Fundamentals of Human Relations | 6 hours |
| Intra-personal, Interpersonal and Group Relationships, Transactional Analysis Implications for Managers in Organizational Context. Formal Written Communication: Official Letters, Report, Writing: Categories Formats, Memorandums and Circulars, Agenda and Minutes, Resume, Drafting Advertisements. Enquires and Replies, Quotations, Voluntary Offers, Placing of Order, Cancellation of Order, Complains and Adjustments. Formal Verbal Communication: Group Discussion, Interview, Extempore, Business Negotiation, Public Speaking, Meeting, Toasting, Counselling, Business Presentation. Negotional Skills. Social Skills for Managers: Update of Etiquettes a Manager should observe in Various Formal and Informal Situations; The Knowledge of Body Language. | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|------------------------|-----------|------------|------------|------------|
| Name of The Course | Data Structures | L | T | P | C |
| Course Code | BCAS1008 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. **Introduce the fundamentals and abstract concepts of Data Structures.**
2. **Introduce searching, sorting techniques**
3. **Learn how concepts of data structures are useful in problem solving.**

Course Outcomes

| | |
|------------|---|
| CO1 | Understand the Basic concepts of Data Structures. |
| CO2 | Understanding various searching & sorting techniques. |
| CO3 | Analyze step by step and develop algorithms for Linked List to solve real world problems. |
| CO4 | Applying various data Structures like Stacks, Queues in real world problems. |
| CO5 | Implement and developed new program for graphs and trees using C. |

Text Books

1. Data Structures : By Seymour Lipschutz, Tata Mcgraw- Hill Publication.
2. Data Structure and algorithm using C :By R.S.Salaria-Khanna Publication.
3. Horowitz and Sahani, “Fundamentals of Data Structures”, Galgotia Publication

Reference Books

1. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein “Data Structures Using C and C++” , PHI
2. Jean Paul Trembley and Paul G. Sorenson, “An Introduction to Data Structures with applications”, McGraw Hill
3. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education
4. Lipschutz, “Data Structures” Schaum’s Outline Series, TMH
5. G A V Pai, “Data Structures and Algorithms”, TMH

| | | |
|---------------|---------------------------------------|----------------|
| Unit-1 | Introduction to Data Structure | 6 hours |
|---------------|---------------------------------------|----------------|

| | | |
|---|--|----------------|
| Introduction, Basic Terminology : Data and information, ADT, Data Organization and types of Data Structure. | | |
| Unit-2 | Arrays | 8 hours |
| Representation of Linear Arrays, Types of Arrays : 1D,2D & M-D Concept, Sorting & Searching Algorithms-Bubble, Selection, Merge, Quick sort, linear and binary search. Type of Memory Allocations | | |
| Unit-3 | Linked List | 8 hours |
| Concept of Linked List, Representation of linked List in memory, Memory Allocation, Garbage Collection ,Overflow and Underflow, Traversing a linked list, Searching a linked list, Insertion & Deletion in Linked List, More types of linked list: Header Linked List , Two way List and Circular linked list | | |
| Unit-4 | Stacks, Queues , Recursion | 8 hours |
| Concepts of Stack, Operation on Stack, Array Representation of Stack, Arithmetic Expression POLISH Notation, Concepts of Queue, Operation on Queue, Representation of queues, Other types of queue: Priority Queues, De-queue and Circular queue. Recursion : factorial number, Fibonacci series and Tower of Hanoi | | |
| Unit-5 | Introduction of Trees and Graph | 6 hours |
| Introduction of Trees – Binary Trees –Binary Search Trees. Types of Graph | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|-----------------------|-----------|------------|------------|------------|
| Name of The Course | Web Technology | L | T | P | C |
| Course Code | BCAS1009 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

This course is intended to provide students with the knowledge and skills necessary for building and evaluating web sites. It covers a range of topics including: basic concepts of the Internet and internet browsers, fundamentals of Website design, Websites building tools and languages, basics of HTML (text, fonts, colors, images, lists, tables, frames, forms), Scripting and Scripting Languages (VB Script, Java Script), Website publishing, Website evaluation and assessment, case studies.

Course Outcomes

| | |
|------------|--|
| CO1 | The student will gain programming skills both in basic and advanced levels using HTML and CSS. |
| CO2 | Demonstrate the knowledge and able to apply the design principles, techniques and technologies to the development of creative websites using JS and HTML |
| CO3 | Apply different syntactical elements of vbscript |
| CO4 | The student will be able to create ASP based web applications |
| CO5 | Understand database connectivity procedures for web applications |

Text Books

Web Design: A Complete Introduction by Nigel Chapman and Jenny Chapman. John Wiley & Sons

Reference Books

HTML 4.0, No Experience required – E. Stephen Macj, J. Platt (bpb)

Completer Reference HTML - Thomas A. Powell (TMH)

Dynamic HTML in action - Michele Petrovisjy (TMH)

Unleashed HTML - (Techmedia SAMS)

| | | |
|--|------------------------------|----------------|
| Unit-1 | Introduction and HTML | 6 hours |
| Basic web designing: Introduction to web browser, architecture of web browser, web page, static & dynamic web pages, home page, web-site, Web-servers & clients, www. Introduction to HTML: History, structure of HTML document, creating & executing HTML. Tags of HTML, Creating Lists & Links, Creating Bookmarks, Image tags, Tables and Frames tags. Forms and CSS: Understanding Form, <FORM> tag, creating text boxes, buttons, checkboxes, radio | | |

buttons, hidden control, password, lists & dropdown list, textarea. Submitting a form, get & post method. Creating CSS, applying CSS to HTML documents. Use of <META> Tag.

| | | |
|--|-----------------------------------|----------------|
| Unit-2 | JavaScript | 8 hours |
| JavaScript: Introduction: Scripting Language, The Use of JavaScript, Using Javascript in an HTML document, <SCRIPT> Tag. Overview of Javascript Programming: Variable, Scope of variables, number & string, Operators Statements: if-else, for, while, break, continue, for-in, new, return. Arrays, JavaScript Functions & Objects, Document Object Model (DOM), Hierarchy of objects. Properties & Methods of Objects, Event Handling & Form Validation. | | |
| Unit-3 | VBScript | 8 hours |
| Introduction, VBScript Statements and loops, Arrays, VBScript objects, VBScript layout statements, error handling, adding objects, Forms, Controls & managing transactions, VBScript event programming, Procedures & Functions | | |
| Unit-4 | ASP | 8 hours |
| Introduction, Variables, Data types of ASP, Statements, Request & Response Objects: Response Object - buffering page, page caching, Request Object – QueryString collection, form collection, server-variables collection, working with HTML forms, retrieving form data using text boxes, textareas, buttons, checkboxes, select lists. Form validation, Session & Application Object. | | |
| Unit-5 | Database and File system | 6 hours |
| ASP with Databases: Connection and data sources, creating connections with OLEDB and ODBC, connecting to SQL server with OLEDB and ODBC, connection to MS-Access, Executing SQL statements. Working with Record set, File System Object(FSO), Folder object | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|-----------------|--------------------------------|----------|----------|----------|----------|
| BCAS1007 | Principle of Management | L | T | P | C |
| Version No. 1.0 | Date of Approval: Jun XX, 2013 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| co-requisites | | | | | |

Course Objectives

The objective of this course is to:

1. provide a basis of understanding to the students with reference to working of business organization through the process of management

Course Outcomes

At the end of the course student will be able to:

1. Student will understand the basic principles of management - will acquaint himself with management process, functions and principles.
2. Student will also get the idea about new developments in management

Catalog Description

The purpose of this course is to provide basic principles of management - will acquaint himself with management process, functions and principles. The main goal of the course is to teach the students about new developments in management

Text Books

1. Essential of Management - Horold Koontz and Iteinz Weibrich -McGrawhills International

Reference Books

1. Management Theory & Practice - J.N.Chandan.
2. Essential of Business Administration - K.Aswhatha Himalaya Publishing House
3. Principles & practice of management- Dr. L.M.Parasad, Sultan Chand & Sons-New Delhi
4. Business Organization & Management - Dr. Y.K. Bhushan.
5. Management: Concept and Strategies by J. S. Chandan, Vikas Publishing.
6. Principles of Management by Tripathi, Reddy Tata McGraw Hill

Course Content

Unit I: Nature of Management

8 hours

Meaning, Definition, its nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration-Organization

Unit II: Evolution of Management Thought

8 hours

Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Various approaches to management (i.e. Schools of management thought) Indian Management Thought

Unit III: Functions of Management- Part-I

8 hours

Planning - Meaning - Need & Importance, types levels - advantages & limitations. Forecasting - Need & Techniques Decision making - Types - Process of rational decision making & techniques of decision making Organizing - Elements of organizing & processes Types of organizations, Delegation of authority - Need, difficulties in delegation - Decentralization Staffing - Meaning & Importance Direction - Nature - Principles Communication - Types & Importance Motivation - Importance - theories Leadership - Meaning - styles, qualities & functions of leaders .

Unit IV: Functions of Management- Part-II

8 hours

Controlling-Need, Nature, importance, Process & Techniques, Coordination - Need – Importance

Unit V: Strategic Management and Recent Trends in Management

8 hours

Strategic Management :Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India

Recent Trends in Management: Social Responsibility of Management – environment friendly management, Management of Change, Management of Crisis , Total Quality Management Stress Management, International Management

| BCAS1010 | Object Oriented Programming With C++ | L | T | P | C |
|---------------|--------------------------------------|---|---|---|---|
| Version No. 2 | Date of Approval: Jun XX, 2013 | 3 | 0 | 0 | 3 |
| prerequisite | | | | | |
| co-requisites | | | | | |

Course Objectives

The objective of this course is to:

1. Introduce the fundamentals and abstract concepts of object oriented programming.
2. Introduce basic features of object oriented programming such as data hiding, operator overloading, inheritance are given emphasis
3. Learn how concepts of object oriented are useful in problem solving using C++.

Course Outcomes

At the end of the course student will be able to:

3. Use and implement appropriate technique for the required problems using C++.
4. Analyze step by step and develop programs to solve real world problems.
5. Implementing various problems, which involve object orientation using C++.

Catalog Description

The purpose of this course is to provide basic concepts of object oriented programming. The basic features of object oriented programming such as data hiding, operator overloading, inheritance are given emphasis.

Text Books

1. Herbert Schildt, C++ - The Complete Reference, Third Edition -Tata McGraw Hill - 1999.
2. Bruce Eckel, Thinking in C++, Second Edition, Volume One, Pearson Education Asia, 2000.

Reference Books

1. Object Oriented Programming in C++ by Robert Lafore Techmedia Publication.
2. The complete reference C – by Herbert shieldt Tata McGraw Hill Publication.
3. Object Oriented Programming in C++ Saurav Sahay Oxford University Press.
4. Object Oriented Programming in C++ R Rajaram New Age International Publishers 2nd.
5. OOPS C++ Big C++ Cay Horstmann Wiley Publication.

Course Content

Unit I: Introduction: Basic Terminology

8 hours

Introduction to OOP- Overview of C++ - Classes - Structures - Union - Friend Functions - Friend Classes - Inline Functions - Constructors - Destructors - Static Members - Scope Resolution Operator.

Unit II: POINTERS**8 hours**

Array of Objects - Pointer to Object - This Pointer - References - Dynamic Memory Allocation - Function Overloading - Default Arguments - Overloading Constructors.

Unit III: OPERATORS**8 hours**

Operator Overloading - Member Operator Function - Friend Operator Function - Inheritance - Types of Inheritance - Protected Members - Virtual Base Class - Polymorphism - Virtual Functions - Pure Virtual Functions.

Unit IV: CLASS**8 hours**

Class Templates and Generic Classes - Function Templates and Generic Functions - Overloading a Function Template - Exception Handling - Namespaces.

Unit V: I/O STREAMS**8 hours**

I/O Streams - Formations I/O with ios Class Functions and Manipulators - Overloading - File I/O.

| BCAS1011 | Data Structure Lab | L | T | P | C |
|-----------------|--------------------------------|---|---|---|---|
| Version No. 1.0 | Date of Approval: Jun XX, 2013 | 0 | 0 | 2 | 1 |
| prerequisite | BCA 117 | | | | |
| co-requisites | | | | | |

Course Objectives

The objective of this course is to:

1. Teach efficient storage mechanisms of data for an easy access.
2. Design and implementation of various basic and advanced data structures.
3. Introduce various techniques for representation of the data in the real world.
4. Learn to design user defined data structure.

Course Outcomes

At the end of the course student will be able to:

1. Understand variety of types of data structures.
2. Understand wide variety of data structures and use them appropriately to solve problems
3. Understand and implement of fundamental algorithms & their applications, namely Linked-List and Array-List and simple sorting algorithm etc.

List of Experiment:

1. Write a program to compute minimum/maximum of a given array.
2. Write a program to sort given set of numbers in ascending/descending order using Bubble Sort and analyze its complexity.
3. Write a menu-based program to perform array operations: deletion of an element from the specified position, inserting an element at the specified position, printing the array elements.
4. Write a program to search an element in the array using linear search.
5. Write a program to search an element in a 2-dimensional array.
6. Write a program to perform following operations in matrix:
 - a. Addition
 - b. Subtraction
 - c. Multiplication
 - d. Transpose
7. Write a menu-based program to perform following operations on single linked list:
 - a. To insert a node at the beginning of the list.
 - b. To insert a node at the end of the list.
 - c. To insert a node after a given node in the list.
 - d. To delete the first node from the list.
 - e. To delete the last node from the list.

- f. To delete a node after a given node from the list.
 - g. To delete a node at a given position from the list.
8. Write a menu-based program to perform following operations on double linked list:
 - a. To insert a node at the beginning of the list.
 - b. To insert a node at the end of the list.
 - c. To insert a node after a given node in the list.
 - d. To delete the first node from the list.
 - e. To delete the last node from the list.
 - f. To delete a node after a given node from the list.
 - g. To delete a node at a given position from the list.
 9. Write a menu-based program to perform following operations on circular linked list:
 - a. To insert a node at the beginning of the list.
 - b. To insert a node at the end of the list.
 - c. To insert a node after a given node in the list.
 - d. To delete the first node from the list.
 - e. To delete the last node from the list.
 - f. To delete a node after a given node from the list.
 - g. To delete a node at a given position from the list.
 10. Write a menu-based program to implement stack operations: PUSH, POP using array implementation of stack.
 11. Write a menu-based program using functions to implement stack operations: PUSH, POP using linked implementation of stack.
 12. Write a program to convert infix expression into postfix expression and then to evaluate resultant postfix expression.
 13. Write a program to solve Towers of Hanoi Problem.
 14. Write a menu-based program to implement linear queue operations: INSERTION, DELETION using array implementation of queue.
 15. Write a menu-based program to implement linear queue operations: INSERTION, DELETION using linked list implementation of queue.
 16. Write a menu-based program to implement circular queue operations: INSERTION, DELETION.
 17. Write a program to traverse a binary tree using PRE-ORDER, IN-ORDER, POST-ORDER traversal techniques.
 18. Write a menu-based program to perform operations for a binary search tree (BST).
 - a. Search an element
 - b. Find minimum
 - c. Find maximum
 - d. Insertion
 - e. Deletion

19. Write a program to traverse a graph using breadth-first search (BFS), depth-first search (DFS).
20. Write a program to sort given set of numbers in ascending/descending order using insertion sort and also search a number using binary search.
21. Write a program to sort given set of numbers in ascending/descending order using Quick sort and selection sort. Also record the time taken by these two programs and compare them.
22. Write a program to sort given set of numbers in ascending/descending order using Merge sort.

| BCAS1012 | Web Technology Lab | L | T | P | C |
|-----------------|--------------------------------|---|---|---|---|
| Version No. 1.0 | Date of Approval: Jun XX, 2013 | 0 | 0 | 2 | 1 |
| prerequisite | CSE121 | | | | |
| co-requisites | | | | | |

Course Objectives

The objective of this course is to:

5. Teach efficient methods of designing a creative and dynamic website
6. Design and implementation dynamic and interactive web pages by embedding Java Script code in HTML. Use Java Script to validate user input.
7. Introduce various techniques for representation of the data in the real world.
8. Learn to design user defined Systematic way of developing a website.. Know regarding internet related technologies.

Course Outcomes

At the end of the course student will be able to:

1. Demonstrate the knowledge and ability to apply the design principles, techniques and technologies to the development of creative websites.

List of Experiment:

1. To create a basic web page consisting of various HTML tags.
2. To create HTML links.
3. To create HTML Table.
4. To create HTML list.
5. To create CSS file in HTML.
6. To create Student Registration Forms in HTML.
7. To create HTML Frame.
8. Introduction to java script like Add,DIV,Mul,Sub etc.
9. Using java script variables, data type and object.
10. Using java script function.
11. Using java script using validation in HTML forms.

12. Introduction to VB Script like Add,Div,Mul,Sub etc.

13. Using data type & variable.

14. Using VB Script loops and conditions.

15. Using VB script variable & procedures.

16. Introduction to ASP

17. WAP in ASP displaying the current date and time

18. WAP in ASP print the hours minutes and second

Value Added List of Experiments

1. In the XML create a program of employee detail like employee id, name, salary, designation.....

| BCAS1013 | Object Oriented Programming With C++ Lab | L | T | P | C |
|-----------------|--|---|---|---|---|
| Version No. 1.0 | Date of Approval: Jun XX, 2013 | 0 | 0 | 2 | 1 |
| prerequisite | CA 142 | | | | |
| co-requisites | | | | | |

Course Objectives

The objective of this course is to:

9. Teach efficient storage mechanisms of data for an easy access.
10. Design and implementation of various basic and advanced C++ Programming.
11. Introduce various techniques for representation of the programming in the real world.
12. Learn to design user defined Program.

Course Outcomes

At the end of the course student will be able to:

4. Understand variety of OOPS characteristic.
5. Understand wide variety of keywords and use them appropriately to write program
6. Understand and implement of fundamental terminology & their applications, namely function, string and simple pointer etc.

List of Experiment:

1. Write a simple C++ program to print "Hello World!".
2. WAP that generates the following table:

| | |
|-------------|--------------|
| 1990 | 135 |
| 1991 | 7290 |
| 1992 | 11300 |
| 1993 | 16200 |

3. Create a Union called student with the following details as variables within it.
 1. Name of the student
 2. Age
 3. Year of study
 4. Semester
 5. different subject marks in array

Write a C++ program to create object for the union to access these and print the Name, age, year, semester and grade according to their percentage of marks scored.

90 % and above – S grade
 80% to 89% -- A grade
 70% to 79% -- B grade
 60% to 69% -- C grade
 50% to 59% -- D grade
 <50% -- F grade

4. Write a C++ program to perform different arithmetic operation such as addition, subtraction, division, modulus and multiplication using inline function
5. Create a class for counting the number of objects created and destroyed within various block

using constructor and destructors.

6. Write a C++ program to calculate the area of triangle and square.

7. Write a program in C++ to check whether the string is palindrome or not.

8. Write a program to evaluate the following investment equation: $V = P(1+r)^n$. Test your program for following values:- P: 1000, 2000, 3000, r: 0.10,0.11,0.12,.....0.20, n=1,2,3.....10.

9. A cricket team has the following table of batting figures. Write a program to read the figures in the given format and calculate the batting averages and print the complete table along with the batting averages.

| Player's Name | Runs Scored | Innings Played | Times Not Out |
|---------------|-------------|----------------|---------------|
| Sachin | 8530 | 230 | 18 |
| Saurav | 4200 | 130 | 9 |
| Rahul | 3350 | 105 | 11 |

10. An electricity board charges the following rates to domestic users to discourage the wastage of electricity. For the first 100 units: 60 P/unit. For the next 200 units: 80 P/unit. Beyond 300 units: 90 P/units. All users are charged a minimum of Rs.50. If the total amount is more than Rs 300 then additional surcharge of 15% is added. Write a program to read the names of users and number of units consumed and print the total charges with names of consumers.

11. A phone number, such as (212) 767- 8900, can be thought of having three parts: the area code (212), the exchange (767), and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure **phone**. Create two structure variables of type **phone**. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:

Enter your area code, exchange, and number: 415 555 1212

My number is (212) 767-8900

Your number is (415) 555-1212

12. A point in the two-dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis, and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of X coordinates of the two points, and whose Y coordinate is the sum of their Y coordinates. WAP that uses a structure called **point** to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with program might look like this:

Enter coordinates for p1: 3 4

Enter coordinates for p2: 5 7

Coordinate for p1 + p2 are: 8, 11

13. Create a structure called **Volume** that uses three variables of type **Distance** to model the volume of a room. Initialize a variable of type **Volume** to specific dimensions, then calculate the volume it represents and printout the result. To calculate the volume, convert each dimension from a **Distance** variable to a variable of type **float** representing feet and fractions of a foot, and then multiply the resulting three numbers.

FUNCTIONS:

14. Write a function called **circarea()** that finds the area of the circle. It should take an argument of type **float** and return an argument of same type. Write a **main()** function that gets a radius value from the user, calls **circarea()**, and displays the result.

15. Raising a number **n** to a power **p** is the same as multiplying **n** by itself **p** times. Write a function called **power()** that takes a **double** value for **n** and an int value for **p**, and returns the result as **double**

value. Use a default argument of 2 for **p**, so that if this argument is omitted, the number will be squared. Write a **main()** function that gets values from the user to test this function.

16. Write a program in C++ to find the factorial of a given number using the class **fact**.

17. Write a program in C++ to find Fibonacci series using class.

18. Construct a class named **account** with member functions deposit and withdraw. Test this in a C++ program.

19. Write a C++ program to implement **flight** class with data member as flight no., source, destination and fare. Write a copy constructor and a member function to display the flight information.

20. Write a C++ program to implement a **sphere** class with appropriate data member and member functions to find the surface area and the volume.

(Surface area = $4 \pi r^2$ and Volume = $\frac{4}{3} \pi r^3$)

21. Define a class "BankAccount". Include the following members. Data members: Name of depositor, Account number, Account type, Balance amount in the account. Member Functions: To assign initial values, To deposit an amount, To withdraw an amount after checking the balance, To display name and balance. Write a program in C++ to test.

22. Create a class that imitates part of the functionality of the basic data type **int**. Call the class **Int** (note different spelling). The only data in this class is an **int** variable. Include member functions to initialize an Int to 0, to initialize it to an **int** value, to display it(it looks just like an int), and to add two **Int** values.

WAP that exercises this class by creating two initialized and one uninitialized Int values, adding these two initialized values and placing the response in the uninitialized value, and then displaying this result.

23. Imagine a tollbooth at a bridge. Cars passing by the booth are expected to pay a fifty-cent toll. Mostly they do, but sometimes a car goes by without paying. The tollbooth keeps track of the number of cars that have gone by, and of the total amount of money collected.

Model this tollbooth with a class called **tollbooth**. The two data items are a type **unsigned int** to hold the total numbers of cars, and a type **double** to hold the total amount of money collected. A constructor initializes both these to 0. A member function called **payingCar()** increments the car total and adds 0.50 to cash total. Another function called **nopayCar()**, increments the car total but adds nothing to the cash total. Finally, a member function called **display()** displays the two totals.

Include a program to test this class. This program should allow the user to push one key to count a nonpaying car. Pushing the ESC key should cause the program to print out the total cars and total cash and then exit.

24. Create a class time that has separate int member data for hours, minutes, and seconds. One constructor should initialize this data to 0, and another should initialize it to fixed values. A member function should display it, in 11:59:59 format. The final member function should add two objects of type time passed as arguments.

A **main()** program should create two initialized time objects, and one that is not initialized. Then it should add the two initialized values together, leaving the result in the third time variable. Finally it should display the value of this third variable.

ARRAYS:

| | | | | | |
|---------------------------|------------------------------|-----------|------------|------------|------------|
| Name of The Course | Computer Architecture | L | T | P | C |
| Course Code | BCAS2001 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

To introduce students to the different functional units of a computer system and to describe the various concepts of the same.

Course Outcomes

| | |
|------------|--|
| CO1 | Study of the basic concept of computer organization |
| CO2 | Implementation of control unit techniques and the concept of Pipelining |
| CO3 | Analysis of the design of arithmetic & logic unit and understanding of the fixed point and floating point arithmetic operations. |
| CO4 | Understanding the different ways of communicating with I/O devices and standard I/O interfaces |
| CO5 | Understanding the hierarchical memory system, cache memories and virtual memory |
| CO6 | Understanding the parallel processing ,Flynn's classification |

Text Book (s)

1 M. M. Mano – Computer System Architecture – 3rd Edition – PHI – 1994.

Reference Book (s)

1. SubrataGhoshal-Computer Architecture and Organization-First Impression-Pearson-2011
2. J. P. Hayes – Computer Architecture and Organization – McGraw–Hill – 1988 3rd Edition.

| | | |
|---------------|---|----------------|
| Unit-1 | Register Transfer and Micro-operations | 8 hours |
|---------------|---|----------------|

| | | |
|--|----------------------------------|----------------|
| Register Transfer Language-Register Transfer-Bus and Memory Transfers-Arithmetic Micro Operations-Logic Micro Operations-Shift Micro Operations-Arithmetic Logic Shift Unit-Basic Computer organization and design-Instruction Codes Control- Instruction Cycle- Memory Reference Instructions-Input Output and Interrupt-Complete | | |
| Unit-2 | Central Processing Unit | 8 hours |
| Introduction-General Register Organization-Stack organization, Instruction Format, Addressing Modes-Data Transfer and Manipulation-Program Control. | | |
| Unit-3 | Computer Arithmetic | 8 hours |
| Computer Arithmetic – Addition and Subtraction – Multiplication and Division Algorithms – Floating-Point and decimal Arithmetic operations | | |
| Unit-4 | Input–Output Organization | 8 hours |
| Input–Output Organization – Peripheral devices – I/O Interface – Asynchronous Data Transfer – Modes of Transfer – Direct Memory – Access I/O Processor | | |
| Unit-5 | Memory Organization | 8 hours |
| Memory Hierarchy – Associative Memory- Cache Memory -Virtual Memory | | |
| Unit-6 | Parallel Processing | 4 Hour |
| Parallel processing challenges – Flynn’s classification – SISD, MIMD | | |

| | | | | | |
|---------------------------|-----------------------------------|-----------|------------|------------|------------|
| Name of The Course | Database Management System | L | T | P | C |
| Course Code | BCAS2002 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. Explain data management and the use of various techniques in the manipulation of data subject to various constraints.
2. Describe the entity relationship diagram and to explain the basic concepts of database recovery, concurrency control, security and integrity.

Course Outcomes

| | |
|------------|--|
| CO1 | Identify data relationships and to design relational database tables adopting the normalization rules. |
| CO2 | Students able to understand E-R Modeling. |
| CO3 | Be familiar with the concept of Normalization. |
| CO4 | Understand the concept of Data Models. |
| CO5 | Be familiar with the concept of Back Up & Recovery. |

| | | |
|---|--|----------------|
| Unit-1 | Introduction: Basic Terminology | 6 hours |
| Introduction: Purpose of Database systems - overall system structure – Data Model | | |
| Unit-2 | E-R Modeling | 8 hours |
| Entity relationship model: entities and entity sets relationships - mappings constraints - primary keys - E.R diagram | | |
| Unit-3 | Normalization | 8 hours |
| Relational database design: pitfalls – Normal Forms - 1 NF, 2NF 3NF and BCNF | | |
| Unit-4 | Data Models | 8 hours |

| | | |
|---|-----------------------------------|----------------|
| Basic concepts of Hierarchical data model – Tree structure diagram, Network Data Model-Data Structure diagram | | |
| Unit-5 | Back Up & Recovery | 6 hours |
| Basic concepts of database recovery -concurrency control - Database security and integrity | | |
| Unit-6 | Advancement & Research | 4 hours |
| PL SQL, Data Mining Concepts, ML, Research methodologies, research discussion & publication | | |

Text Book (s)

1. Henry F. Korth and Abraham Silberschatz: Database system concepts, McGraw Hill International Publication, 1988 (Chapters 1 to 6 and 9 to 13), 2nd Edition,1991.

Reference Book (s)

1. Jeffrey D Ullman: Principles of data Base systems, Galgotia Publishers, 2nd Edition 1994.
2. C.J. Date, An Introduction to database Systems, Third Ed., Narosa 3rd Edition 1995

| | | | | | |
|---------------------------|-------------------------|-----------|------------|------------|------------|
| Name of The Course | Java Programming | L | T | P | C |
| Course Code | BCAS2003 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

Introduce students Core Java Concepts and to teach students the basic concepts of Java programming. This course covers preliminaries, I/O streaming and file handling and teach students how to program applets in Java, networking and allow the students to implement effectively

Course Outcomes

| | |
|------------|--|
| CO1 | Implement and use efficiently the java programs, can develop applets, able to access database with JDBC, work with networking protocols using java with attractive GUI |
| CO2 | Language Basics |
| CO3 | String Handling |
| CO4 | Exception Handling |
| CO5 | Input / Output |

Text Book (s)

1. R. Naughton and H. Schildt – Java2 (The Complete Reference) – Fifth Edition – TMH – 2004.

Reference Book (s)

1. K. Arnold and J. Gosling – The Java Programming Language – 3rd Edition., Pearson Edu,2005
2. David Flanagan – Java in a Nutshell: A Desktop Quick Reference for Java Programmers– O'Reilly & Associates, Inc. 1999
3. Bruce Eckel –Thinking in Java – Prentice Hall, 2nd Ed 2002

| | | |
|--|---------------------|----------------|
| Unit-1 | Introduction | 6 hours |
| Introduction - Object oriented fundamentals, History-Java and the Internet-Java Applets and Applications, Features of Java, Java Virtual Machine (JMV), Byte-Code ,JAVA buzzwords, JAVA Environments, Command Line Arguments, Java program structure, Reserved keywords, Identifiers, Literals, Operators, Separators, Variables, Declaring a variable, Scope and lifetime | | |

| | | |
|---|-----------------------------------|----------------|
| of variables, Data types, Type conversion, casting | | |
| Unit-2 | Language Basics | 8 hours |
| Control Statements, Arrays- One-Dimensional Arrays, Two-dimension Array, Vectors, Operators-Arithmetic, Boolean logical, Relational and Bitwise operators-Operator Precedence. Class :Fundamentals ,The General Form of a Class ,A Simple Declaring Objects, Assigning Object Reference Variables, Methods: Overloading Methods, Using Objects as Parameters, A Closer Look at Argument Passing ,Returning Objects, Recursion Introducing Access Control, Overriding Methods, Final Variables and Methods, Final class, Finalizer Methods, Abstract Methods and Class, Visibility Control, Constructors | | |
| Unit-3 | String Handling | 8 hours |
| String : Strings, String Constructors, String length, String Literals, String Concatenation, data types-String conversion. Inheritance : basic ,Types of Inheritance, Member Access, Creating a Multilevel Hierarchy, When Constructors Are Called Method Overriding, Why Overridden Methods?, Abstract Classes, Using final with Inheritance, Using final to Prevent Overriding . Using final to Prevent Inheritance, Packages and Interfaces | | |
| Unit-4 | Exception Handling | 8 hours |
| Exception Handling: Exceptions Exception hierarchy, Try, Catch, Finally, Throw | | |
| Unit-5 | Input / Output | 6 hours |
| Java.io Package-I/O Basics-Reading console Input-Writing console output Print Writer class- Reading and Writing files-Java I/O classes, Byte Stream Classes, Character Stream | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|--|-----------|------------|------------|------------|
| Name of The Course | Introduction to Algorithm Analysis and Design | L | T | P | C |
| Course Code | BCAS2004 | 3 | 0 | 0 | 3 |
| Prerequisite | Fundamentals of programming & Data structures | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

To introduce students, the concepts of algorithm analysis for find out the space and time complexity of different algorithms. Different design techniques such as greedy method, divide and conquer, backtracking, dynamic programming, branch and bound are to be studied for finding the solution to the different problems. It also provides an insight into the basic concepts of NP and NP-hard problems and their relevance in research.

Course Outcomes

| | |
|------------|--|
| CO1 | On completion of this subject the student shall be able to find out the efficiency of algorithms for different problems. |
| CO2 | Students able to understand data structure concepts |
| CO3 | Understand advance design and analysis techniques |
| CO4 | Understand the concept of Graph Algorithms |
| CO5 | Understand the concept of NP-Hard and NP-Completeness |

Text Book (s)

T. Cormen, C.E. Leiserson, R.L. Rivest& C. Stein – Introduction to Algorithms – PHI – 2nd Edition, 2005.

Reference Book (s)

1. Knuth E. Donald, Art of Computer Programming Sorting and Searching Vol3, Second Edition, Pearson Education.
2. Brassard Bratley, “Fundamental of Algorithms”, PHI
3. A V Ahoetal, “The Design and analysis of Algorithms”, Pearson Education
4. Adam Drozdek, “Data Structures and Algorithms in C++”, Thomson Asia

| | | |
|---|--|----------------|
| Unit-1 | Introduction to Algorithms & Analysis | 6 hours |
| Introduction to Algorithms & Analysis- Design of Algorithms, Growth of function, Complexity of Algorithms, Asymptotic Notations, Recurrences. Sorting: Insertion Sort, Quick Sort, Merge Sort | | |
| Unit-2 | Advance Data Structure | 8 hours |
| Advanced Data Structure: Binary Search Trees, Red Black Trees | | |
| Unit-3 | Advance Design and Analysis Techniques | 8 hours |
| Advanced Design and Analysis Techniques: Dynamic programming, Greedy Algorithm | | |
| Unit-4 | Graph Algorithms | 8 hours |
| Graph Algorithms: Elementary Graph Algorithms, Breadth First Search, Depth First Search, Minimum Spanning Tree, Kruskal's Algorithms, Prim's Algorithms, Single Source Shortest Path | | |
| Unit-5 | Special Topics in AAD | 6 hours |
| String Matching, Introduction of NP-Hard and NP-Completeness , Matrix Operations | | |
| Unit-6 | Advanced Topics in AAD | 4 hours |
| | Advancement in the course, Research methodologies, research discussion & publication | |

| | | | | | |
|---------------------------|-------------------------------------|-----------|------------|------------|------------|
| Name of The Course | Enterprise Resource Planning | L | T | P | C |
| Course Code | BCAS2006 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

- Know basic business functional areas and explains how they are related.
- Illustrate how un-integrated information systems fail to support business decision and how integrated information systems can help a company prosper by providing business managers with accurate, consistent, and current data.
- Understand how Enterprise Resource Planning software is used to optimize business processes acquire experience in using ERP software that can be applied in further coursework

Course Outcomes

| | |
|------------|--|
| CO1 | Understand the basic concepts of ERP. |
| CO2 | Understand the enterprise modelling and related concepts |
| CO3 | Identify different technologies used in ERP. |
| CO4 | Understand and apply the concepts of ERP implementation and Perspective and ERP Modules. |
| CO5 | Understand different tools/technologies used in ERP. |

Text Books

- Enterprise Resource Planning, Alexis Leon, Tata McGraw-Hill.
- Concepts in Enterprise Resource Planning, Third Edition Bret Wagner & Ellen Monk

Reference Books

- Concepts in Enterprise Resource Planning, Joseph A. Brady, Ellen F. Monk, Bret J. Wagner.
- Enterprise Resource Planning Systems, Daniel E. O'Leary, Cambridge University Press.

| | | |
|--|---|----------------|
| Unit-1 | ERP: An Overview | 6 hours |
| Introduction to ERP, Reasons for Growth Of ERP, Problem areas in ERP implementations, The future of ERP, Characteristics and features of ERP, Benefits of ERP. | | |
| Unit-2 | Enterprise Modelling and Integration for ERP | 8 hours |
| Enterprise-An overview, What is enterprise , Integrated Management Information, The role of | | |

enterprise, Business modelling, Integrated Data Model, Role of Common/Shared Enterprise Database, Establishing Customer-Enterprise Link, Establishing Vendor-Enterprise Link, Client/Server Architecture and Enterprise wide Computing, Characteristics of client/Server Architecture, Different Components of ERP Client/Server Architecture

| | | |
|---------------|-------------------------------------|----------------|
| Unit-3 | ERP And related Technologies | 8 hours |
|---------------|-------------------------------------|----------------|

BPR(Business Process reengineering) :Definition, The different phases of BPR, Enterprise Redesign Principles, BPR and IT, Data Warehousing, Data Warehouse Components, Structure and Uses of Data Warehouse, Data Mining, What Is Data Mining, Data Mining Process, AdvAnti-ages and Technologies Used In Data Mining, OLAP, Supply Chain Management: Definition, Benefits, ERP Vs SCM, CRM

| | | |
|---------------|---------------------------|----------------|
| Unit-4 | ERP Implementation | 8 hours |
|---------------|---------------------------|----------------|

Evolution, Evolution of ERP, Evolution of Packaged Software Solutions, The Obstacles in ERP implementation, ERP Implementation Lifecycle (Different Phases), Implementation Methodology, ERP Implementation-The Hidden Costs, In-house Implementation-Pros and Cons, Vendors and role of vendors for ERP, ConsultAnti-s and role of consultAnti-s for ERP.

| | | |
|---------------|-----------------------------------|----------------|
| Unit-5 | Technologies In ERP System | 6 hours |
|---------------|-----------------------------------|----------------|

Introduction, Electronic Data Interchange(EDI), Use of EDI, Evolution of EDI, Benefits of the EDI, EDI Standards, EDI Services, EDI Components, EDI Administration, EDI Integration, ALE Integration, Internet Integration, OCR Integration

| | | |
|---------------|-----------------------------------|----------------|
| Unit-6 | Advancement & Research | 4 hours |
|---------------|-----------------------------------|----------------|

Advancement in the course, Research methodologies, research discussion & publication

| | | | | | |
|---------------------------|----------------------------|-----------|------------|------------|------------|
| Name of The Course | Computer Networking | L | T | P | C |
| Course Code | BCAS2007 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. Teach fundamental concepts of networks.
2. Give hands on training of network installation and configuration

Course Outcomes

| | |
|------------|---|
| CO1 | Understand basic of networking from the user's, developer's and administrator's perspective |
| CO2 | Students able to Physical Layer and Data Link Layer |
| CO3 | Understand the concept of Network Layer |
| CO4 | Demonstration of Transport and Application Layer |
| CO5 | Students able to known network administration |
| CO6 | Analysis various advanced concepts in computer Networking. |

Text Book (s)

- 1.A.S.Tanenbaum, "Computer Networks"; Pearson Education Asia, 4 thEd. 2003.
- 2.BehrouzA.Forouzan, "Data Communication and Networking", Tata McGraw Hill,
- 3.William stallings, "Data and computer communications", Pearson education Asia, ,

Reference Book (s)

1. MCSE: Networking Essentials Study Guide -- Tata McGrawHill Publication
2. MCSE: Windows 2000 N/W Infrastructure design - Tata McGraw Hill Publication

| | | |
|--|---|----------------|
| Unit-1 | Basic Concepts, Network Reference Models | 6 hours |
| Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks | | |

| | | |
|---|---|----------------|
| (LAN,WAN,PAN). Network Topologies (Bus, Star, Ring, Star Bus, Star Ring and Physical Mesh) , OSI and TCP/IP Models: Layers and their functions, comparison of models | | |
| Unit-2 | Physical Layer and Data Link Layer | 8 hours |
| Transmission Media: Guided and Unguided. CSMA, Ethernet, FDDI, Token Ring ,Wireless LAN. DLL: Basic functions of DLL, Circuit switching, packet switching and message switching. Flow control, error control. MAC | | |
| Unit-3 | Network Layer | 8 hours |
| Hub, Repeaters, bridges, gateways, routers, design issues of network layer, Routing algorithms,. Network Layer Protocols: IPv4 – Unicast Routing Algorithms – Protocols – Multicasting Basics – IPV6 Addressing – IPV6 Protocol, ARP – RARP –DHCP – ICMP | | |
| Unit-4 | Transport and Application Layer | 8 hours |
| Transport layer: Process- to- Process delivery, Data traffic, Congestion control: Open loop, closed loop. Flow control and error Control. UDP – TCP. Application Layer: Client- Server model, DNS. DNS in internet E-mail, SMTP, FTP, HTTP, World Wide Web | | |
| Unit-5 | Network Administration | 6 hours |
| Analyzing the technical support structure(Network manager support, End-user Support), Analyzing the current Network Management, Managing Network Connections, Installing and configuring Network adapters, Installing and Configuring TCP/IP Protocol, Managing network bindings, Sharing files and Printers, Building Internet and Intranet Infrastructure, IP address scheme, assigning IP addresses | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the Network, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|--------------------------------|-----------|------------|------------|------------|
| Name of The Course | Computer Networking Lab | L | T | P | C |
| Course Code | BCAS2008 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

| EX.NO. | TITLE OF LAB EXPERIMENTS |
|---------------|---|
| 1 | Basic Networking Commands |
| 2 | Sliding Window |
| 3 | Cyclic RedundAnti- Check |
| 4 | Routing - Shortest Path Single node |
| 5 | Broad Casting |
| 6 | Multi-Casting |
| 7 | Address Resolution Protocol |
| 8 | Implementation of TCP |
| 9 | Implementation of UDP |
| 10 | File Transfer Protocol |
| 11 | Domain name Service (DNS) |
| 12 | Learning about Configuration of sharing the files/Desktop/Printer |

| | | | | | |
|---------------------------|-----------------------------|-----------|------------|------------|------------|
| Name of The Course | Java Programming Lab | L | T | P | C |
| Course Code | BCAS2009 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

List of Experiment:

1. Write a program that will print a "hello java" message on the screen.
2. Write a program to read a string from the command line and display the string on the screen.
3. Write a program to read an integer from the command line and calculate square root of that value.
4. Write a program to read an integer value through Scanner class and check whether it is even or odd.
5. Write a program to create constructor of a class and initialize values in it and later print them.
6. Write a java code to implement the concept of method overloading.
7. Write a java code to implement the concept of constructor overloading.
8. Write a java code to implement the concept of simple inheritance, multilevel inheritance, and hierarchical inheritance.
9. Write a program to show how method overriding is implemented in java.
10. Write a program to implement the concept of abstract classes.
11. Write a program to implement multiple inheritances using interface.
12. Write a java code to demonstrate the concept of inner classes.
13. Write a java code to show both the uses of "super" keyword.
14. Write a program to create your own package and import that package in a program.
15. Write a java program to show the use of various string functions like concat, indexOf.
16. Write programs for Exception handling using try, catch, throw and finally.
- 17 Write a program to read a single character from keyboard using Buffered Reader class and print it

| | | | | | |
|---------------------------|---------------------------------------|-----------|------------|------------|------------|
| Name of The Course | Database Management System Lab | L | T | P | C |
| Course Code | BCAS2010 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

LIST OF EXPERIMENTS

- 1) Implement Data Definition language Statements.
 - 2) Implement Data Manipulation Statements.
 - 3) Implement SELECT command with different clauses.
 - 4) Implement various type of Integrity Constraints on database.
 - 5) Implement SINGLE ROW functions (Character, Numeric, Date functions) and GROUP functions (avg, count, max, min, sum).
 - 6) Implement various type of SET OPERATORS (Union, Intersect, Minus)
 - 7) Implement the concept of grouping of Data and Subqueries.
 - 8) Implement the concept of Data Control Language (DCL), Transaction Control Language(TCL).
 - 9) Implement Simple and Complex View.
- Value Added Experiments
- 10) Create a Database for Banking Sector and implement various queries on it.
 - 11) Create a Database for Customer Sale/purchase and implement various queries on it.

| | | | | | |
|---------------------------|-------------------------|-----------|------------|------------|------------|
| Name of The Course | Operating System | L | T | P | C |
| Course Code | BCAS2015 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. Provide the fundamental principles of modern operating systems that explores design aspects of modern operating systems.
2. Solve problems using the above concepts.

Course Outcomes:

| | |
|------------|--|
| CO1 | Understand how the operating system abstractions can be used in the development of application programs, or to build higher level abstractions |
| CO2 | Understand how the operating system abstractions can be implemented |
| CO3 | Understand the principles of concurrency and synchronization, and apply them to write correct concurrent programs/software |
| CO4 | Understand basic resource management techniques (scheduling or time management, space management) and principles and how they can be implemented. These also include issues of performance and fairness objectives, avoiding deadlocks, as well as security and protection |
| CO5 | Understand the storage management concepts |

Text Book(s)

1. Operating System Concepts (7th Ed) by Silberschatz and Galvin, Wiley, 2000.

Reference Books

1. Operating Systems (5th Ed) – Internals and Design Principles By William Stallings, Prentice Hall,
2. Modern Operating Systems by Andrew S Tanenbaum, Prentice Hall India, 1992.
3. Operating Systems (3rd edition) by Gary Nutt, Nabendu Chaki, Sarmishtha Neogy, Pearson

4. Operating Systems Design & Implementation Andrew S. Tanenbam, AlbertS. Woodhull Pearson
5. Operating Systems Achyut S. Godbole Tata Mc Graw Hill
6. Operating Systems D.M.Dhardhere Tata Mc Graw Hill

| | | |
|--|-----------------------------------|----------------|
| Unit-1 | Introduction | 6 hours |
| Operating System and Function, Evolution of Operating System, System Software, OS services and Components: Multitasking , Multiprogramming, Multiprocessing, Time Sharing, Buffering, Spooling, Distributed OS | | |
| Unit-2 | Process Management | 8 hours |
| Concept of process and threads: Process states, Process management, Critical Section, Problem, Semaphores, Classical Problems in Concurrency, Inter Processes Communication, Process Generation, Process Scheduling | | |
| Unit-3 | Scheduling | 8 hours |
| Scheduling Concept, Performance Criteria Scheduling Algorithm, Evolution, Multiprocessor Scheduling. Deadlock: System Model, Deadlock Characterization, Prevention, Avoidance and Detection | | |
| Unit-4 | Memory Management | 8 hours |
| Memory partitioning: Swapping, Paging, Segmentation Virtual memory: Overlays, Demand paging, Performance of Demand paging, Virtual memory concepts, Page replacement algorithms, Allocation algorithms, Example OS : Linux | | |
| Unit-5 | I/O Management | 6 hours |
| I/O Devices and The Organization of I/O Function, I/O Buffering, Disk I/O, Operating System Design Issues. File System: File Concept, File Organization and Access Mechanism, File Directories, File Protection, File Sharing, Implementation Issues | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advance concepts in OS, API, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|-----------------------------|-----------|------------|------------|------------|
| Name of The Course | Software Engineering | L | T | P | C |
| Course Code | BCAS2016 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

Identify, formulate, analyze, and solve problems, as well as identify the computing requirements appropriate to their solutions

Course Outcomes:

| | |
|------------|--|
| CO1 | Understand basic concepts and applications of Software Engineering. |
| CO2 | Work with software requirement engineering process. |
| CO3 | Understand the concepts of software design. |
| CO4 | Develops the basic concepts of Coding and Testing concepts. |
| CO5 | Understand the principles of software maintenance. |

Text Book (s)

1. Roger S Pressman, "Software Engineering – A Practitioner's Approach", McGraw Hill, USA, 2007.
2. Sommerville I, "Software Engineering", Pearson Education India, New Delhi, 2006.

Reference Books

1. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
2. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
3. Pankaj Jalote, Software Engineering, Wiley

| | | |
|--|---------------------|----------------|
| Unit-1 | Introduction | 6 hours |
| Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models, Selection of Software Process models | | |

| | | |
|--|--|----------------|
| Unit-2 | Requirement Engineering Process | 8 hours |
| Requirement Engineering Process: Elicitation, Analysis, Documentation, Analyzing a problem, creating software specification document, review for correctness, consistency, and completeness, Management of User Needs, Feasibility Study, Characteristics and components SRS Document, IEEE Standards for SRS. Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model | | |
| Unit-3 | Software Design | 8 hours |
| Software Design: Refining the software Specification; Software design, fundamental design concept for data, Abstraction, Modularity, Software architecture, Cohesion and Coupling, Architectural design and procedural design, Data flow oriented design, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design, creating design document: Review of conformance for software requirements and quality. | | |
| Unit-4 | Implementation & Testing | 8 hours |
| Coding: Relationship between design and implementation, Implementation issues and programming support environment; Coding the procedural design, Good coding style and review of correctness and readability, Structured Programming, need for structured programming, Coding standards, Coding style, Maintainability of programs, Code documentation – Code efficiency Testing : Software testing, Testing Objectives, Levels of testing– Unit Testing, Integration Testing, System testing, Acceptance Testing, Verification Vs Validation, Testing for Functionality and Testing for Performance, Top-Down and Bottom-Up Testing , Incremental Vs Nonincremental testing, Structural Testing (White Box Testing), Functional Testing (Black Box Testing). | | |
| Unit-5 | Maintenance | 6 hours |
| Maintenance: Software as an Evolutionary Entity, Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re- Engineering, Reverse Engineering. Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Function Point (FP) Based Measures, Cyclomatic Complexity Measures, Software Risk Analysis and Management | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advance concepts in Software Engineering, Methodologies, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|------------------------|-----------|------------|------------|------------|
| Name of The Course | .Net Technology | L | T | P | C |
| Course Code | BCAS2025 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the Framework.
2. By building sample applications, the student will get experience and be ready for large-scale projects

Course Outcomes:

| | |
|------------|--|
| CO1 | To understand the basis of .NET Framework. |
| CO2 | Develop applications with c# using .NET Framework. |
| CO3 | Develop applications with Visual Basic using .NET Framework. |
| CO4 | Develop active server pages using .NET Framework. |
| CO5 | Read and write data from/to files in ADO.Net |

Text Book (s)

1. Visual studio 2010 - A beginners guide - Joseph Mayo.

Reference Books

1. Jeffrey R. Shapiro "The Complete Reference Visual Basic .NET" Tata Mcgraw Hill (2002 Edition).
2. Pro ASP.NET 4 in C# 2010, MacDonald and Freeman
3. Visual Studio 2010 and .NET 4 Six-in-One (Wrox Programmer to Programmer)

| | | |
|---|---------------------|----------------|
| Unit-1 | Introduction | 6 hours |
| Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations, Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions, Defining classes and class members. Assembly, Components of Assembly, Private and Shared Assembly, Garbage Collector, JIT compiler. Namespaces Collections, Comparisons and Conversions, Delegates and Events | | |
| Unit-2 | C# | 8 hours |
| Getting Started with .Net Framework, Exploring Visual Studio .NET, Inside a C# Program, Data | | |

Types, Statements, Arrays, Using Strings, Objects, Classes and Structs, Properties, Inheritance, Indexers, Delegates, Events, Namespaces, Generics, Collections and Data Structures, Exception Handling, Threading, Using Streams and Files, Reflection, Assemblies, versioning, Windows Forms, Controls, Data binding to Controls, Advanced Database Programming using ADO.net, Using GDI +, Networking, .net Remoting, Manipulating XML

| | | |
|--|-----------------------------------|----------------|
| Unit-3 | VB.Net | 8 hours |
| Creating Applications with Visual Basic.NET, Variables, ConstAnti-s, and Calculations, Making Decisions and Working with Strings, Lists, Loops, Validation, Sub Procedures and Functions, Multiple Forms, Standard Modules, and Menus, Arrays, Timers, Form Controls, File Handling, Exception Handling, Working with Databases, Advanced Database Programming using ADO.net, Classes, Generics, Collections, Inheritance, Custom Controls, Packaging & deployment, Using Crystal Reports | | |
| Unit-4 | ASP.Net | 8 hours |
| Building a Web Application, Examples Using Standard Controls, Using HTML Controls, Validating Form Input Controls using Validation Controls, Understanding Applications and State, Applying Styles, Themes, and Skins, Creating a Layout Using Master Pages, Binding to Databases using Controls, Data Management with ADO.net, Creating a Site Navigation Hierarchy, Navigation Controls , Membership and Role Management, Login Controls, Securing Applications, Caching For Performance, Working with XML, Using Crystal Reports in Web Forms | | |
| Unit-5 | DBMS | 6 hours |
| Databases: Introduction, Using SQL to work with database, retrieving and manipulating data with SQL, working with ADO.NET, ADO.NET architecture, ASP.NET data control, data source control, deploying the web site. Crystal reports. LINQ: Operators, implementations, LINQ to objects, XML, ADO.NET, Query Syntax | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the Framework, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|-----------------------------|-----------|------------|------------|------------|
| Name of The Course | Linux Administration | L | T | P | C |
| Course Code | BCAS2021 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. To familiarize students with the Linux environment
2. To learn the fundamentals of shell scripting/programming
3. Design and implement common system automation tasks using shell scripts

Course Outcomes

| | |
|------------|---|
| CO1 | Understand the history of Linux and its environment. Comparing Linux and UNIX operating system. Demonstrating the installation of Linux based operating system (Fedora and Ubuntu) on computer system. |
| CO2 | Explain and appraise the philosophy behind Open Source Software and GNU Public License. Differentiating between Windows based OS and Linux based OS. |
| CO3 | Understanding and Practicing basic Linux commands - ls, cp, cat, mv, rm, chmod, ping, who, who -b, who-m. Analysing security and System Integrity. Managing Processes and users on Linux system. Managing networking using NFS and NIS. |
| CO4 | Understanding boot process and analysing LILO and GRUB boot methods. Analysing dual boot using Linux and Windows based operating system. Explain different aspects of the Linux file system and compare different file systems on a Linux distribution. |
| CO5 | Understanding and practicing vi editor and shell. Understanding and practicing shell programming constructs. Creating and executing shell scripts. |

Text Book (s):

1. Richard Petersen, The Complete Reference – Linux, McGraw-Hill.
2. LINUX kernel development by Robert Love.
3. Yashwanti-Kanetkar, UNIX & Shell programming – BPB
4. Wale Soyinka, “Linux Administration: A Beginner’s Guide”, McGraw Hill Companies

Reference Book (s):

1. M.G.Venkateshmurthy, Introduction to UNIX & Shell Programming, Pearson Education
2. Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, “Linux in a Nutshell”, O’Reilly

| | | |
|---------------|--|----------------|
| Unit-1 | History and Installation of Linux | 6 hours |
|---------------|--|----------------|

| | | |
|--|---|----------------|
| History, Hardware and Environmental Considerations, Server Design, Methods of Installation, Installing Fedora, Installing Ubuntu Server. Dual-Booting Issues, Comparison between UNIX and LINUX | | |
| Unit-2 | Introduction to Linux: Basic Terminology | 8 hours |
| Linux – The Operating System, Open Source Software, Features of Linux, GNU, GNU Public License, AdvAnti-ages of Open Source Software, Difference between Windows and Linux | | |
| Unit-3 | Linux Commands | 8 hours |
| General-Purpose commands, File oriented commands, directory oriented commands, Communication-oriented commands, process oriented commands. Commands like: ls, cp, cat, mv, rm, chmod, ping, Who, who –b, who-m etc. Security and system Integrity, Starting and Stopping the System, System Activity and Process Management, Users, Miscellaneous. | | |
| Unit-4 | Boot Methods and Linux file system | 8 hours |
| Boot Methods: The Boot Process, LILO, GRUB, Dual-Booting Linux and Windows XP/Vista, BootTime Kernel Options.Introduction to Linux file system: Architecture, aspects/features of file system, different types of file systems. | | |
| Unit-5 | Shell Programming | 6 hours |
| Vi Editor, features of different shells,I/Oinshell, controlstructures,loops, subprograms. Shell scripts: Creating&executingshell scriptsinLinux, shell variables, purpose of shell scripts | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|---|-----------|------------|------------|------------|
| Name of The Course | iOS, Android APP Development Lab | L | T | P | C |
| Course Code | BCA9003 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

Course Objectives:

1. To understand the design aspects of operating system.
2. To study the process management concepts & Techniques.
3. To study the storage management concepts.

Course Outcomes

| | |
|------------|---|
| CO1 | To use of an operating system to develop software |
| CO2 | To write software systems based on multiple cooperating processes or threads |
| CO3 | To implement file organization techniques |
| CO4 | To implement file allocation strategies |
| CO5 | To implement process scheduling & synchronization algorithms |

List of Experiment:

1. Create a basic Android application to display a string "Welcome to Android" using strings.xml and Explore the directory structure and components of android application.
2. Write a program to create a birthday card displaying greetings using Relative layout and TextViews.
3. Write an Android app that takes user's name as input in an EditText box and on pressing button "OK" will Toast message Welcome <user name>.
4. Create an Android program for a simple Calculator app using UI controls and show arithmetic operations +, -, /, * and mod operations on two operands. Perform input validation and appropriate processing.
5. Write an Android App to display a menu of fast-food items and accepts users order, accordingly generate a Bill. Use Checkbox, Textview, Toast, and button.
6. Write a program using radio button that will select any one of option from movie type(comedy, horror, action, thriller) and toast the message on submit button is clicked.

7. Write an Android app for selecting <item> using spinner.
8. Write an Android app For Registration Form using Explicit Intent.
9. Write a program that accepts user's orders for beverages (tea/coffee) and snacks (chips/cookies) and sends order confirmation email to the user with amount payable.
10. Write a program to start another activity using explicit intent to enter user's information and process response from the activity started in main activity. Use StartActivityForResult.

Value Added Experiments

11. Write an android program for sending SMS using Implicit Intents
12. Write an android app using content provide to access the database.
13. Write an app to create a customized listview of contacts like whatsapp list.

| | | | | | |
|---------------------------|----------------------------------|-----------|------------|------------|------------|
| Name of The Course | .Net technology Lab (PBL) | L | T | P | C |
| Course Code | BCAS2026 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

List of Experiments

1. Write a program in C# to add, subtract, multiply, and divide two numbers.
2. Write a program in C# to compute the area of a circle.
3. Write a program in C# to compute the sum of first 100 numbers.
4. Write a program in C# that uses Building class and displays the following output:
5. house has:
 - 3 floors
 - 4 occupAnti-s
 6. 2500 total area
 7. 625 area per person
8. Write a program in C# to handle divide- by-Zero exception.
9. Write a program in Visual Basic to compute the factorial of a number.
10. Write a program in Visual Basic to find the roots of quadratic equation.
11. Write a program in Visual Basic to convert temperature from Fahrenheit to Celsius and vice versa.
12. Write a program in Visual Basic to compute the area of triangle and rectangle.
13. Value Addition Experiments
14. Write a program to display holiday in calendar using ASP.Net.
15. Write a program to display the phone number of an author using database.

| | | | | | |
|---------------------------|---------------------------------|-----------|------------|------------|------------|
| Name of The Course | Linux Administration Lab | L | T | P | C |
| Course Code | BCAS2022 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

| S.No | Title of the lab experiment |
|-------------|--|
| 1 | Study of any Open source software |
| 2 | Process for installing ubuntu open source software |
| 3 | Study of general purpose utilities commands. |
| 4 | Study of user & session management commands. |
| 5 | Study of file system navigation commands, text processing tools, communication commands. |
| 6 | Study of VI editor. |
| 7 | Study of Shell Script |
| 8 | Execute C & C++ programs in Linux. |
| 9 | Installation of Linux operating system. a. Partitioning drives b. Configuring boot loader (GRUB/LILO) c. Network configuration d. Setting time zones e. Creating password and user accounts f. Shutting down |
| 10 | Do the following changes in Grub file a. Write the path where the grub file is located. b. Change the timeout and title of the system. |
| 11 | Bash shell a.buit-in commands b.arithmetic expressions c.functions |

| | | | | | |
|---------------------------|---|-----------|------------|------------|------------|
| Name of The Course | Big Data Computing | L | T | P | C |
| Course Code | BCAS3001 | 3 | 0 | 0 | 3 |
| Prerequisite | Data Structure & Algorithms, Computer Architecture, Operating System, Database Management Systems | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. To provide an overview of an exciting growing field of big data analytics
2. To understand the enabling technologies for Big Data
3. To learn the tools required to manage and analyze big data like Hadoop, NoSql MapReduce.
4. To study the Big Data applications using Machine learning algorithms
5. To learn the Machine learning libraries to apply Big Data applications
6. To study the recent trends and tools on Big data applications

Course Outcomes

| | |
|------------|---|
| CO1 | Understanding the fundamentals of Big data analytics |
| CO2 | Applying enabling technologies for Big Data analytics |
| CO3 | Implementing the Hadoop, NoSql and MapReduce |
| CO4 | Applying the Machine learning algorithms on Big data applications |
| CO5 | Applying the Spark Machine Learning libraries on Big data applications |
| CO6 | Reading the recent research papers and applying machine learning algorithms |

| | | |
|---------------|---------------------------------|----------------|
| Unit-1 | Introduction to Big Data | 6 hours |
|---------------|---------------------------------|----------------|

| | | |
|---|-----------------------------------|----------------|
| Introduction to Big Data: Why Big Data and Where did it come from?, Characteristics of Big Data Volume, Variety, Velocity, Veracity, Valence, Value, Challenges and applications of Big Data | | |
| Unit-2 | Enabling Technologies | 8 hours |
| Introduction to Enabling Technologies for Big Data, Introduction to Big Data Stack, Introduction to some Big Data distribution packages | | |
| Unit-3 | Big Data Platforms | 8 hours |
| Introduction to Big Data Platforms, Overview of Apache Spark, HDFS, YARN, Introduction to MapReduce, MapReduce Programming Model with Spark, MapReduce Example: Word Count, PageRank etc. | | |
| Unit-4 | Big Data Applications | 8 hours |
| Introduction to Big Data Applications (Machine Learning), Overview of Big Data Machine Learning, Mahout Introduction, Big Data Machine learning Algorithms in Mahout- k-means, Naïve Bayes etc. | | |
| Unit-5 | Big data Machine learning | 6 hours |
| Introduction of Big data Machine learning with Spark, Big Data Machine Learning Algorithms in Spark Introduction to Spark MLlib, Introduction to Deep Learning for Big Data | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

Text Books

1. Bart Baesens, Analytics in a Big Data World: The Essential Guide to Data Science and its Applications, Wiley, 2014
2. NPTEL: Big Data Computing, By Prof. Rajiv Misra

<https://nptel.ac.in/courses/106/104/106104189>

Reference Books

1. Dirk Deroos et al., Hadoop for Dummies, Dreamtech Press, 2014.
2. Chuck Lam, Hadoop in Action, December, 2010.
3. Leskovec, Rajaraman, Ullman, Mining of Massive Datasets, Cambridge University Press.
4. I.H. Witten and E. Frank, Data Mining: Practical Machine learning tools and techniques.
5. Erik Brynjolfsson et al., The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies, W. W. Norton & Company, 2014.

| | | | | | |
|---------------------------|--------------------------|-----------|------------|------------|------------|
| Name of The Course | Computer Graphics | L | T | P | C |
| Course Code | BCAS3003 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. To introduce students to the basics of computer graphics.
2. Learn how concepts of computer graphics are useful.

Course Outcomes

| | |
|-----|---|
| CO1 | Apply mathematics, physics and computer programming to computer graphics applications and write programmes for various output primitives. |
| CO2 | Summarize and critically review the routines in computer graphics packages like Paint Brush. |
| CO3 | Compare various object representation systems in Graphics systems. |
| CO4 | Be immediately ready to contribute in a significant way to the computer graphics industry. |
| CO5 | Demonstrate the knowledge, technical skills and personal discipline to be successful in a specialized, computer-based graphics field and develop understanding on various kinds of research, objectives of doing research, research process, and research designs |

Text Books

1. D. Hearn, P. Baker, "Computer Graphics - C Version", 2nd Edition, Pearson Education, 1997

Reference Books

1. Heam Donald, Pauline Baker M: "Computer Graphics", PHI 2nd Edn. 1995.
2. Harrington S: "Computer Graphics - A Programming Approach", 2nd Edn. Mc GrawHill.
3. Shalini Govil-Pai, Principles of Computer Graphics, Springer, 2004.

| | | |
|---|-------------------------------------|----------------|
| Unit-1 | Overview of Graphics Systems | 6 hours |
| Video display devices, Raster-Scan System, Random-Scan, Systems. Random-Scan Systems Graphics monitors and work stations. Input devices: Hard copy devices. Graphics software | | |

| | | |
|---|--|----------------|
| Unit-2 | Output primitives | 8 hours |
| Line drawing algorithms circle generation algorithms. Ellipse Generating, Algorithm. Pixel Addressing. Filled-Area Primitives. Fill Area Function, Cell Array, Character, Generation | | |
| Unit-3 | Attributes of Output Primitives | 8 hours |
| Line Attributes, Curve Attributes, Color and Gray-Scale levels. Area-Fill Attributes, Character Attributes. Bundled attributes. Inquiry functions. Two-dimensional geometric transformations: Basic transformations | | |
| Unit-4 | Transformation | 8 hours |
| Homogenous coordinates, composite transformations, other transformations. Affine transformations, transformation functions, Roster methods for transformations | | |
| Unit-5 | Two-dimensional viewing | 6 hours |
| The viewing pipeline, viewing transformation, viewing functions. Line clipping, Cohen Sutherland line clipping, Liang Barsky line clipping Polygon clipping: Sutherland-Hodgman polygon clipping, Weiler Amerton polygon clipping | | |
| Unit-6 | Advancement & Research | 4 hours |
| Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Basic idea Publications. | | |

| | | | | | |
|---------------------------|-------------------|-----------|------------|------------|------------|
| Name of The Course | E-Commerce | L | T | P | C |
| Course Code | BCAS3004 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

To provide students with a good understanding in planning, design, development, deployment and management of e-commerce systems and applications

Course Outcomes

| | |
|-----|---|
| CO1 | Understand the basic concepts and technologies used in the field of MIS and e-commerce. |
| CO2 | Policy and regulatory issues in E-commerce. |
| CO3 | Implement information systems and e-commerce website. |
| CO4 | Handle security threats in electronic commerce. |
| CO5 | Use the basic concepts and technologies used in mobile Commerce |

Text Book (s):

1. Ravi Kalakota and Andrew B Whinston, Frontiers of Electronic Commerce, Add. Wesley

Reference Book (s):

1. Pete Loshin, Paul H Murphy, Electronic Commerce, II Edition, Jaico Publishers, 1996.
2. David Whiteley, E-Commerce: Strategy, Technologies and Applications, McGraw Hill, 2000.
3. Daniel Minoli & Emma Minoli – Web Commerce Technology – Tata McGraw Hill, 2002.

| | | |
|--|---------------------|----------------|
| Unit-1 | Introduction | 6 hours |
| Infrastructure of Electronic Commerce – Networks – Packet Switched Networks – TCP/IP – Internet Protocol – Domain Name Services – Web Service Protocols – Internet Applications – Utility Programs – Markup Languages – Web Clients and Servers – Internets and Extranets – Virtual Private Network. | | |

| | | |
|--|---|----------------|
| Unit-2 | Core Technology | 8 hours |
| Electronic Commerce Models – Shopping Cart Technology – Data Mining – Intelligent Agents – Internet Marketing – XML and E-Commerce. | | |
| Unit-3 | Electronic Payment System | 8 hours |
| Real World Payment Systems – Electronic Fund Transfer – Digital Payment – Internet Payment Systems – Micro Payments – Credit Card Transactions | | |
| Unit-4 | Security and Threats | 8 hours |
| Threats to Network Security – Public Key Cryptography – Network Security Solutions –Firewalls | | |
| Unit-5 | Inter/Intra Organizational Electronic Commerce | 6 hours |
| EDI – EDI Application in Business – Legal, Security and Privacy Issues – EDI and Electronic Commerce – Standards – Internal IS | | |

| | | | | | |
|---------------------------|------------------------------------|-----------|------------|------------|------------|
| Name of The Course | Software Project Management | L | T | P | C |
| Course Code | BCAS3006 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti-requisite | | 20 | 30 | 50 | 100 |

Course Outcomes

| | |
|-----|---|
| CO1 | Define and identify the importance of software project management. |
| CO2 | Describe the software project management activities |
| CO3 | Compare and differentiate organization structures and project structures. |
| CO4 | Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools. |
| CO5 | Planning and tracking and oversight in the implementation of the software project management process |

Text Book (s)

1. Clifford F. Gray, Erik W. Larson, "Project Management: The Managerial Process with MS", McGraw Hill

Reference Book (s)

1. M. Cotterell, Software Project Management, Tata McGraw-Hill Publication.
2. Royce, Software Project Management, Pearson Education
3. Kieron Conway, Software Project Management, Dreamtech Press
4. S. A. Kelkar, Software Project Management, PHI Publication.

| | | |
|--|--|----------------|
| Unit-1 | INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT | 6 hours |
| Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning | | |
| Unit-2 | PROJECT EVALUATION | 8 hours |
| Strategic Assessment – Technical Assessment – Cost Benefit Analysis –Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation | | |
| Unit-3 | ACTIVITY PLANNING | 8 hours |
| Objectives – Project Schedule – Sequencing and Scheduling Activities –Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – | | |

| | | |
|--|---|----------------|
| Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control | | |
| Unit-4 | MONITORING AND CONTROL | 8 hours |
| Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring –Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance | | |
| Unit-5 | MANAGING PEOPLE AND ORGANIZING TEAMS | 6hours |
| Introduction – Understanding Behavior – Organizational Behaviour: A Background – Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team –Decision Making – Leadership – Organizational Structures – Stress –Health And Safety – Case Studies | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|------------------------------|-----------|------------|------------|------------|
| Name of The Course | Computer Graphics Lab | L | T | P | C |
| Course Code | BCAS3005 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

List of Experiments

| | |
|----|---|
| 1 | Study of basic graphics functions defined in “graphics.h” |
| 2 | To implement DDA(Digital Differential Algorithm) for line drawing |
| 3 | To implement Bresenham’s algorithm for line drawing |
| 4 | To implement Bresenham's algorithm for circle drawing |
| 5 | To implement Midpoint algorithm for circle drawing |
| 6 | To implement Midpoint algorithm for ellipse drawing |
| 7 | To perform 2D Rotation Transformation |
| 8 | To perform 2-D Translation Transformation |
| 9 | To perform 2-D Scaling Transformation |
| 10 | To perform 2-D Reflection Transformation |
| 11 | To perform a composite Transformation using 2D Transformation |
| 12 | To implement Cohen-Sutherland 2D Line clipping |
| 13 | To implement Sutherland Hodgeman Polygon clipping algorithm |
| 14 | To implement window-viewport mapping |
| 15 | Value Addition Experiments |
| 16 | Designing simple animation using transformations |

| | | | | | |
|---------------------------|--|-----------|------------|------------|------------|
| Name of The Course | Elective-II(2) – Network Security | L | T | P | C |
| Course Code | BCAS3010 | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

1. **Required for the protection of data against accidental or intentional destruction, disclosure or modification.**
2. **Network security refers to the technological safeguards and managerial procedure which can ensure that organizational assets and individual privacy are protected over the network.**

Course Outcomes

| | |
|------------|--|
| CO1 | Describe the Network Security. |
| CO2 | Understand different types of security threats. |
| CO3 | Discuss the Security Mechanisms. |
| CO4 | List of Access Control |
| CO5 | System Security |
| CO6 | Network Security Evaluation research |

Text Books

1. **Stallings, “Cryptography & Network Security, Principles & Practice”, 3rd Edition, Prentice Hall, 2002.**

Reference Books

1. Bruce, Schneier, “Applied Cryptography”, 2nd Edition, Toha Wiley & Sons, 1996.
2. Man Young Rhee, “Internet Security”, Wiley, 2003.
3. Pfleeger & Pfleeger, “Security in Computing”, 3rd Edition, Pearson Education, 2003.

| | | |
|---------------|--|----------------|
| Unit-1 | Introduction: Basic Terminology | 6 hours |
|---------------|--|----------------|

| | | |
|---|-----------------------------------|----------------|
| Attacks, Services, Mechanisms, Conventional Encryption, Classical and Modern Techniques, Encryption Algorithms, Confidentiality | | |
| Unit-2 | Public Key Encryption | 8 hours |
| RSA, Elliptic Curve Cryptography, Number Theory Concepts | | |
| Unit-3 | Message Authentication | 8 hours |
| Hash Functions, Digest Functions, Digital Signatures, Authentication Protocols | | |
| Unit-4 | Network Security Practice | 8 hours |
| Authentication, Applications, Electronic Mail Security, IP Security, Web Security | | |
| Unit-5 | System Security | 6 hours |
| Intruders, Viruses, Worms, Firewalls Design Principles, Trusted Systems | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the course, Research methodologies, research discussion & publication | | |

| | | | | | |
|---------------------------|--|-----------|------------|------------|------------|
| Name of The Course | Elective II lab (2) –Network Security Lab | L | T | P | C |
| Course Code | BCAS3011 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

LIST OF EXPERIMENTS:

1. Study of Network Security fundamentals - Ethical Hacking, Social Engineering practices.
2. Implement the following SUBSTITUTION TECHNIQUES
 - a) Caesar Cipher
 - b) Playfair Cipher
 - c) Hill Cipher
3. Implement the Rail fence – row & Column Transposition Techniques
4. Implement the DES Algorithm
5. Implement the RSA Algorithm
6. Implement the Diffie-Hellman Algorithm
7. Implement the MD5 Algorithm e) SHA-1
8. Implement the Signature Scheme - Digital Signature Standard
9. Study and Implement Various IP Security Techniques
10. Study and Implement Various Web Security Techniques
11. Implement system firewall for network security
12. Study of system attacks and prevention methods
13. Various Network security evaluation research (Content Beyond the Syllabus)

| | | | | | |
|--|---|---|---|---|---|
| BCAS2028 | Advance DBMS | L | T | P | C |
| | | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Objectives: | To study the further database techniques beyond which covered in the second year, and thus to acquaint the students with some relatively advanced issues. | | | | |
| Expected Outcome: | Student will be able to understand advance database management system techniques at the end of the semester. | | | | |
| Module I | OODBMS & ORDBMS and Advance Database Management System –Concepts & Architecture | | | | |
| OODBMS & ORDBMS: Overview of Object-Oriented concepts & characteristics, Objects, Database design for ORDBMS, Comparing RDBMS, OODBMS & ORDBMS. | | | | | |
| Advance Database Management System –Concepts & Architecture: Spatial data management, Web based systems-Overview of client server architecture, Databases and web architecture, N-tier ,Architecture, Business logic – SOAP, Multimedia databases , Mobile database | | | | | |
| Module II | Parallel databases and Distributed Databases | | | | |
| Parallel databases: Introduction, Parallel database architecture , I/O parallelism , Inter-query and Intra-query parallelism, Interoperation and Intra-operational parallelism , Design of parallel systems. | | | | | |
| Distributed Databases: Introduction, DDBMS architectures , Homogeneous and Heterogeneous, Databases , Distributed data storage , Distributed transactions , Commit protocols , Availability , Concurrency control & recovery in distributed databases , Directory systems. | | | | | |
| Module III | Knowledge base Systems and Data Warehousing | | | | |
| Knowledge base Systems: Integration of expert in database, application & object database overview. | | | | | |
| Data Warehousing: Introduction to Data warehousing , Architecture , Dimensional data modeling- star, snowflake schemas, fact constellation , OLAP and data cubes , Operations on cubes , Data preprocessing -need for preprocessing , data cleaning, | | | | | |
| Module IV | Data Mining | | | | |
| Introduction to data mining , Introduction to machine learning , Descriptive and predictive data mining , outlier analysis, clustering – k means algorithm , Classification - decision tree, association, rules - apriori algorithm , Introduction to text mining, Bayesian classifiers. | | | | | |
| Text Books | | | | | |
| 1. Database system concepts'*, 5 th Edition –by Abraham Silberschatz, Henry Korth, S,Sudarshan, (McGraw Hill International) | | | | | |
| 2. Data Mining: Concepts and systems'*, by Jiawei nan, Micheline Kamber, (Morgan Kaufmann publishers) | | | | | |
| Reference Books | | | | | |
| 1. Database systems: "Design implementation and management", by Rob Coronel, 4 th Edition, (Thomson Learning Press) | | | | | |

| BCAS2029 | Advance DBMS LAB | L | T | P | C |
|--------------------|--|---|---|---|---|
| | | 0 | 0 | 2 | 1 |
| Objectives: | <ul style="list-style-type: none"> To explore the features of a Database Management Systems To interface a database with front end tools To understand the internals of a database system | | | | |
| Experiments | <ul style="list-style-type: none"> Basic SQL Intermediate SQL Advanced SQL ER Modeling Database Design and Normalization Accessing Databases from Programs using JDBC Building Web Applications using PHP & MySQL Indexing and Query Processing Query Evaluation Plans Concurrency and Transactions Big Data Analytics using Hadoop | | | | |
| Outcomes | <ul style="list-style-type: none"> Ability to use databases for building web applications. Gaining knowledge about the internals of a database system. | | | | |
| References | <ol style="list-style-type: none"> Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 6th edition, Tata McGraw Hill, 2011 Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 4th Edition, Pearson/Addision wesley, 2007 | | | | |

| BCAP2030 | Programming Programming Language | L | T | P | C |
|--------------------------|---|---|---|---|---|
| Version1.1 | | 3 | 0 | 0 | 3 |
| Pre-requisites//Exposure | Any Programming Language | | | | |
| co-requisites | | | | | |

Course Objectives

The objective of this course is to:

1. Learn core programming basics—including data types, control structures, algorithm development, and program design with functions.
2. Learn the fundamental principles of Object-Oriented Programming, as well as in-depth data and information processing techniques.
3. Solve problems, explore real-world software development challenges, and create practical and contemporary applications.

Course Outcomes

At the end of this course students will be able to:

1. Gain knowledge of Programming with Python
2. Design and develop a webpage and web sites for need of an organization
3. Use object oriented programming techniques
4. Familiarize with python with string handling techniques
5. Understanding testing and debugging
6. Understanding various algorithms of searching and sorting algorithms and various IDE's in Python.

Catalog Description

This course introduces the student to the Python language. Upon completion of this class, the student will be able to write non trivial Python programs dealing with a wide variety of subject matter domains. Topics include language components, the IDLE environment, control flow constructs, strings, I/O, collections, classes, modules, and regular expressions. The course is supplemented with many hands on labs using either Linux or Windows.

Text Books

1. Budd T A, Exploring Python , 2011, Tata McGraw Hill Education, ISBN-10: 0071321225
2. Kenneth A. Lambert, The Fundamentals of Python: First Programs, 2011, Cengage Learning, ISBN: 978-1111822705.

Reference Books

3. Downey, Allen B., Think Python: How to Think Like a Computer Scientist. O'Reilly, 2012. Obtain free PDF at <http://www.greenteapress.com/thinkpython/>
4. Python Programming: An Introduction to Computer Science (Second Edition) John Zelle, ISBN 978-1-59028-241-0-9, Franklin, Beedle & Associates Inc., 2004.

5. Downey, Allen B., Think Python: How to Think Like a Computer Scientist. O'Reilly, 2012. Obtain free PDF at <http://www.greenteapress.com/thinkpython/>

Course Content

Unit I: Introduction

8 Lecture hours

History , Features , Working with IPython, IPython Notebook, Installing Python, basic syntax, interactive shell, editing, saving, and running a script.

The concept of data types; variables, assignments; immutable variables; numerical types; Arithmetic and Logical operators and Boolean expressions; short-circuit (lazy) evaluation
Debugging, comments in the program; understanding error messages; Catching exceptions using try and except.

Conditional Statements : If, If-else, Nested if-else; Looping: For, While, Nested loops;
Control Statements: Break, Continue, Pass;

Unit II: Function and Strings

7 Lecture hours

Functions in Python: Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa.

Unit III: Lists, Tuples and Dictionaries

8 lecture hours

Basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries.

Unit IV : Files

7 lecture hours

Manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab-separated).

Unit V : Concept of Object Oriented Programming

8 Lecture hours

Objects, Classes, Encapsulation, Inheritance, Polymorphism

| BCAP2031 | Python Programming Language LAB | L | T | P | C |
|--------------------------|---------------------------------|---|---|---|---|
| Version1.1 | | 0 | 0 | 2 | 1 |
| Pre-requisites//Exposure | Any Programming Language | | | | |
| co-requisites | | | | | |

OBJECTIVES:

- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries.
- Read and write data from/to files in Python.

LIST OF PROGRAMS:

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton's method)
3. Exponentiation (power of a number)
4. Find the maximum of a list of numbers
5. Linear search and Binary search
6. Selection sort, Insertion sort
7. Merge sort
8. First n prime numbers
9. Multiply matrices
10. Programs that take command line arguments (word count)
11. Find the most frequent words in a text read from a file
12. Simulate elliptical orbits in Pygame
13. Simulate bouncing ball using Pygame

| | | | | | |
|---------------------------|--|-----------|------------|------------|------------|
| Name of The Course | Elective-I –AI & ML | L | T | P | C |
| Course Code | BCA9001 | 3 | 0 | 0 | 3 |
| Prerequisite | Discrete Maths and Probability Theory | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 20 | 30 | 50 | 100 |

Course Objectives:

Presentation of artificial intelligence as a coherent body of ideas and methods to acquaint the student with the basic programs in the field and their underlying theory. Students will explore this through problem-solving paradigms, logic and theorem proving, language and image understanding, search and control methods and learning.

Course Outcomes

| | |
|------------|---|
| CO1 | Understand different types of AI agents and implement them using different search algorithms. |
| CO2 | Apply the knowledge and reasoning ability in logical agents and planning in real world. |
| CO3 | Understand representation and manipulation of complex information, knowledge and uncertainty. |
| CO4 | Analyse different Classification Techniques. |
| CO5 | Understand the Machine Learning and its application. |

Text Book (s)

1. Elaine Rich and Kevin Knight, “Artificial Intelligence”, McGraw-Hill

Reference Book (s)

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, Pearson Education
2. E Charniak and D McDermott, “Introduction to Artificial Intelligence”, Pearson Education
3. Dan W. Patterson, “Artificial Intelligence and Expert Systems”, Prentice Hall of India

| | | |
|--|---------------------------|----------------|
| Unit-1 | Introduction to AI | 6 hours |
| Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, | | |

| | | |
|--|-----------------------------------|----------------|
| Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents, Computer vision, Natural Language Possessing. | | |
| Unit-2 | Searching | 8 hours |
| Searching for solutions, Uniformed search strategies, Informed search strategies, Hill Climbing, Best First Search, A* Algorithm, Constraint Satisfaction, Search for games, Min-Max and Alpha Beta Pruning. | | |
| Unit-3 | Knowledge Representation | 8 hours |
| Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Clauses and Resolution. | | |
| Unit-4 | Learning | 8 hours |
| SemAnti-ic Nets, Markov Model ,Hidden Markov Models (HMM), Bayesian Networks | | |
| Unit-5 | Machine Learning | 6 hours |
| Introduction to Machine Learning, Supervised and unsupervised learning, Decision trees, Naive Bayes models, EM algorithm, Reinforcement learning. | | |
| Unit-6 | Advancement & Research | 4 hours |
| Advancement in the Machine Learning, Research methodologies, research discussion & publication | | |

| | | | |
|------------------------------|-----------------------------------|-----------------------------|-----------------------|
| UBJECT | AI and ML Using Python Lab | PROGRAMME | B.C.A |
| SUBJECT CODE | BCA9002 | SEMESTER | IV |
| CREDITS | 2 | DURATION OF SEMESTER | 15 Weeks |
| PREREQUISITE SUBJECTS | | SESSION DURATION | 2 Hrs per Week |

List of Experiments

1. (a) Write a python program to print the multiplication table for the given number?
 (b) Write a python program to check whether the given number is prime or not?
 (c) Write a python program to find factorial of the given number?
2. Write a python program to implement simpleChatbot?
3. (a) Write a python program to implement List operations (Nested List, Length, Concatenation, Membership, Iteration, Indexing and Slicing)?
 (b) Write a python program to implement List methods (Add, Append, Extend& Delete).
4. (a). Write a python program to Illustrate Different Set Operations?
 (b). Write a python program to generate Calendar for the given month and year? (c). Write a python program to implement Simple Calculator program?
5. (a) Write a python program to Add Two Matrices.
 (b) Write a python program to Transpose a Matrix
6. Write a python program to implement Breadth First Search Traversal.
7. Write a python program to implement Water Jug Problem.
8. (a) Write a python program to remove punctuations from the given string.
 (b) Write a python program to sort the sentence in alphabetical order.
9. Write a program to implement Hangman game using python.
10. Write a program to implement Tic-Tac-Toe game using python.

ELECTIVE-II

| | | | | | |
|--|--|---|---|---|---|
| BCAP3022 | Multimedia System | L | T | P | C |
| | | 3 | 0 | 0 | 3 |
| Prerequisite | | | | | |
| Objectives: | Student will get the Knowledge about the basics concepts of multimedia and its applications. Student will get the knowledge of its relevance with internet and its future aspects. | | | | |
| Expected Outcome: | Student will gain fundamental knowledge about multimedia and its applications. | | | | |
| Module I | Introduction and Hardware & Software | | | | |
| Introduction : Multimedia - Definitions, Basic properties and medium types.(Temporal and non temporal) . Multimedia applications, Uses of Multimedia, Introduction to making multimedia - The Stages of project, the requirements to make good multimedia, Multimedia skills and training . Hardware and Software for Multimedia: Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Media software - Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards. | | | | | |
| Module II | Building blocks Creating & Editing Media elements | | | | |
| Text, image, Sound, animation Analog/ digital video Data Compression: Introduction, Need, Difference of lossless/lossy compression techniques. Brief overview to different compression algorithms concern to text, audio, video and images etc. | | | | | |
| Module III | Multimedia and the Internet | | | | |
| Multimedia and the Internet: History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW - Web Servers, Web Browsers, Web page makers,and editors, Plug-Ins and Delivery Vehicles, HTML, Designing for the WWW -Working ,on the Web, Multimedia Applications - Media Communication, Media Consumption, Media Entertainment, Media games. | | | | | |
| Module IV | Multimedia-looking towards Future | | | | |
| Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing, Virtual Reality, Digital Camera. Assembling and delivering a Multimedia project-planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM: The CD family, production,process, CD-i – Overview – Media Types Technology | | | | | |
| Text Books | | | | | |
| 1. Tay Vaughan, “Multimedia: Making it work”, TMH, 1999. | | | | | |
| 2. Ralf Steinmetz and Klara Naharstedt, “Multimedia: Computing, Communications Applications”,Pearson, 2001. | | | | | |
| Reference Books | | | | | |

| |
|--|
| 1. Keyes, “Multimedia Handbook”, TMH, 2000. |
| 2. Steve Heath, “Multimedia & Communication Systems”, Focal Press, UK, 1999. |
| 3. K. Andleigh and K. Thakkar, “Multimedia System Design”, PHI, PTR, 2000. |

| BCAP3022 | Multimedia System LAB | L | T | P | C |
|----------|---|---|---|---|---|
| | | 0 | 0 | 2 | 1 |
| | List of Program | | | | |
| : | <ol style="list-style-type: none"> 1. Write a program to justify a text entered by the user on both left and right hand side. forexample the test “ An architect may have a graphics program to draw an entire building but be interested in only ground floor”, can be justified in 30 columns. An architect may have a graphics programs draw an entire building but interested in ground floor. 2. Study the notes of a piano and stimulate them using the keyboard and store them in file 3. Write a program to read a paragraph and store it to a file name suggested by the author 4. Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle. 5. Write a program to show a bitmap image on your computer screen. 6. Create a web page for a clothing company which contains all the details of that company and at least five links to other web pages. 7. Write a program by which we can split mpeg video into smaller pieces for the purpose of sending it over the web or by small capacity floppy diskettes and then joining them at the destination. 8. Write a program to simulate the game of pool table 9. Write a program to simulate the game mine sweeper 10. Write a program to play “wave” or “midi” format sound files | | | | |

| BCAP3010 | NETWORK SECURITY | L | T | P | C |
|--|---|----------|----------|----------|----------|
| Prerequisite | | 3 | 0 | 0 | 3 |
| Objectives: | Objective: This course deals with Network security. It is required for the protection of data against accidental or intentional destruction, disclosure or modification. Network security refers to the technological safeguards and managerial procedure which can ensure that organizational assets and individual privacy are protected over the network.. | | | | |
| Expected Outcome: | On completion of this course students will 1. Describe the Network Security;. 2. Understand different types of security threats; 3. Discuss the Security Mechanisms; and 4. List of Access Control. | | | | |
| Module I | FUNDAMENTALS | | | | |
| Attacks, Services, Mechanisms, Conventional Encryption, Classical and Modern Techniques, Encryption Algorithms, Confidentiality. | | | | | |
| Module II | PUBLIC KEY ENCRYPTION | | | | |
| RSA, Elliptic Curve Cryptography, Number Theory Concepts. | | | | | |
| Module III | MESSAGE AUTHENTICATION | | | | |
| Hash Functions, Digest Functions, Digital Signatures, Authentication Protocols. | | | | | |
| Module IV | NETWORK SECURITY PRACTICE | | | | |
| Authentication, Applications, Electronic Mail Security, IP Security, Web Security. | | | | | |
| Module V | SYSTEM SECURITY | | | | |
| Intruders, Viruses, Worms, Firewalls Design Principles, Trusted Systems. | | | | | |
| Text Book | | | | | |
| 1. . Stallings, “Cryptography & Network Security, Principles & Practice”, 3rd Edition, Prentice Hall, 2002. | | | | | |
| Reference Books | | | | | |
| 1. Bruce, Schneier, “Applied Cryptography”, 2nd Edition, Toha Wiley & Sons, 1996. | | | | | |
| 2. Man Young Rhee, “Internet Security”, Wiley, 2003. | | | | | |
| 3. Pfleeger & Pfleeger, “Security in Computing”, 3rd Edition, Pearson Education, 2003. | | | | | |

| | | | | | |
|---------------------------|-----------------------------|-----------|------------|------------|------------|
| Name of The Course | Network Security Lab | L | T | P | C |
| Course Code | BCAP3011 | 0 | 0 | 2 | 1 |
| Prerequisite | | | | | |
| Co requisite | | IA | MTE | ETE | TOT |
| Anti- requisite | | 70 | | 30 | 100 |

LIST OF EXPERIMENTS:

1. Study of Network Security fundamentals - Ethical Hacking, Social Engineering practices.
2. Implement the following SUBSTITUTION TECHNIQUES
 - a) Caesar Cipher b) Playfair Cipher c) Hill Cipher
3. Implement the Rail fence – row & Column Transposition Techniques
4. Implement the DES Algorithm
5. Implement the RSA Algorithm
6. Implement the Diffie-Hellman Algorithm
7. Implement the MD5 Algorithm e) SHA-1
8. Implement the Signature Scheme - Digital Signature Standard
9. Study and Implement Various IP Security Techniques
10. Study and Implement Various Web Security Techniques
11. Implement system firewall for network security
12. Study of system attacks and prevention methods
13. Various Network security evaluation research (Content Beyond the Syllabus)

| BCA362 | Advanced Computer Network | L | T | P | C |
|--------------------|--------------------------------|---|---|---|---|
| Version No. 1.2 | Date of Approval: Dec XX, 2016 | 3 | 0 | 0 | 3 |
| prerequisite | Computer Network | | | | |
| co-requisites | OS | | | | |
| Course Coordinator | Dr Pallavi Goel | | | | |

Course Content

Unit I: Introduction

9 lecture hours

Basic networking concepts revisited: introduction to networks, layering and link layer, network layer, routing, end-to-end layer, congestion control,

Module II: Modeling and measurement

9 lecture hours

Modeling and measurement: network traffic modeling, network measurement, simulation issues, network coding techniques.

Module III: Routing and Design

10 lecture hours

Routing and router design, scheduling and QoS, integrated and differentiated services, RSVP

Module IV: Wireless Networking

6 lecture hours

Wireless networks and mobility supports, MAC protocol, routing, AODV, group communication, multicast, Flow and congestion control, TCP variants, TCP modeling, active queue management

Module V: Overlay Networks

10 Lectures Hours

Overlay networks: RON, P2P, CDN, Web caching, cross-layer optimizations, Emerging network types: data center, DTN, 4G mobile networks (LTE, Wi-Max), Online social networks (OSN), wireless sensor networks (WSN) – cross-layer sensor data dissemination

Text Books

1. J.F. Kurose and K.W. Ross, Computer networking: A top-down approach, 6th edition, Addison Wesley.
2. L.L. Peterson and BS. Davie, Computer Networks ISE: A System Approach, 5th edition, Morgan Kaufman.

Reference Books

1. B.A. Forouzan, Data communication & networking, 5th Edition, Tata Mc-Graw Hills **Reference Books**

| | | | | | |
|-----------------|----------------------------|----------|----------|----------|----------|
| BCA361 | Connecting Networks | L | T | P | C |
| Version No. 1.2 | | 3 | 0 | 0 | 3 |

Module-1: Configuration and logging to a CISCO Router and introduction to the basic user Interfaces. Introduction to the basic router configuration and basic commands. Configuration of IP addressing for a given scenario for a given set of topologies.

Module-2: Configure a DHCP Server to serve contiguous IP addresses to a pool of four IP devices with a default gateway and a default DNS address. Integrate the DHCP server with a BOOTP demon to automatically serve Windows and Linux OS Binaries based on client MAC address.

Module-3: Configure, implement and debug the following: Use open-source tools for debugging and diagnostics. a. ARP/RARP protocols b. RIP routing protocols c. BGP routing d. OSPF routing protocols e. Static routes (check using netstat) Configure DNS: Make a caching DNS client, and a DNS Proxy; implement reverse DNS and forward DNS, using TCP dump/Wireshark characterize traffic when the DNS server is up and when it is down.

Module-4: Configure FTP Server on a Linux/Windows machine using a FTP client/SFTP client characterize file transfer rate for a cluster of small files 100k each and a video file of 700mb. Use a TFTP client and repeat the experiment.

Module-5: Configure a mail server for IMAP/POP protocols and write a simple SMTP client in C/C++/Java client to send and receive mails , Implement Open NMS+ SNMPD for checking Device status of devices in community MIB of a Linux PC. Using yellow pages and NIS/NFS protocols implement Network Attached Storage Controller (NAS). Extend this to serve a windows client using SMB. Characterize the NAS traffic using Wireshark.