# SCHOOL OF MANAGEMENT SCIENCES

**VARANASI**

**(AN AUTONOMOUS COLLEGE)**

**(www.smsvaranasi.com)**

# BACHELOR OF COMPUTER APPLICATIONS

# (B.C.A.)

# (Three Year Course)

# Semester – Wise Papers in BCA Course

| | | Subject I | Subject II | Subject III | Subject IV | Vocational | Co-Curricular | Project | Credits | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Major | Major | Major | Minor/ Elective | Minor | Minor | Major | | |
| | | 4/5/6 | 4/5/6 | 4/5/6 | 4/5/6 | 3 | 2 | 3/6/8 | | |
| | | Credits | Credits | Credits | Credits | Credits | Credits | Credits | | |
| Year | Sem | Own Faculty | Own Faculty | Any Faculty | Other Department/ Faculty (Choose Any One) | Vocational Faculty | Co-Curricular Course | Inter/Intra Faculty related to main Subject | Total Credit | Total Credit/ Sem |
| 1 | I | Fundamentals of Mathematics (6) | Emerging Information Technologies (6) | Programming in C (6) | Management Principles / Intellectual Property Rights (4) | Office Automation (3) | Food, Nutrition and Hygiene (2) | | 18+4+3+2 | 27 |
| | II | Digital Electronics and Computer Organization (6) | Operating Systems (6) | Data Structures using C (6) | Statistical Methods / Entrepreneurship and Innovation (4) | Business Analytics (3) | First Aid and Health (2) | | 18+4+3+2 | 27 |
| 2 | III | Computer Networks (6) | Discrete Mathematics (6) | Object Oriented Programming using C++ (6) | Basics of Accounting and Finance / E-Commerce (4) | Web Design (3) | Human Values and Environment Studies (2) | | 18+4+3+2 | 27 |
| | IV | Design and Analysis of Algorithms (6) | Management Information Systems (6) | Database Management System (6) | Organisational Behaviour / Business Economics (4) | Digital Marketing (3) | Physical Education and Yoga (2) | | 18+4+3+2 | 27 |
| 3 | V | Software Engineering (5) | Optimization Techniques (5) | Fundamentals of Artificial Intelligence (4) | Java Programming (6) | | Analytical ability and Digital Awareness (2) | Project –ONE (3) | 14+6+2+3 | 25 |
| | VI | Cloud Computing (5) | Cyber Security (5) | Introduction to Data Sciences (4) | Python Programming (2) | | Communication Skill and Personality Development (2) | Project-TWO (3) | 14+6+2+3 | 25 |
| Total Credit of Entire Programme | | | | | | | | | | 158 |

**Course Structure**

**for**

**BCA (BACHELOR OF COMPUTER APPLICATION) – FIRST YEAR**

**(Effective from Session 2022-23)**

**FIRST SEMESTER**

| S. No. | SubjectCode | Subject Name | Periods | | | Sessional | | | ESE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | | | |
| 1. | BCA-22-101 | Fundamentals of Mathematics | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 2. | BCA-22-102 | Emerging Information Technologies | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 3. | a) BCA-22-103 | Programming in C | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | b) BCA-22-103P | Programming in C Lab | 0 | 0 | 2 | 15 | 10 | 25 | 75 | 100 | 2 |
| 4. | BCA-ME-22-104 | Management Principles | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | BCA-ME-22-105 | Intellectual Property Rights | | | | | | | | | |
| 5. | BCA-VC-22-106 | Office Automation | 0 | 0 | 3 | 15 | 10 | 25 | 75 | 100 | 3 |
| 6. | CC-1 | Food, Nutrition and Hygiene | 2 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 2 |
| **Total** | | | | | | | | | | **700** | **27** |

**CT**: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/ Tutorial/ Practical

**SECOND SEMESTER**

| S. No. | SubjectCode | Subject Name | Periods | | | Sessional | | | ESE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | | | |
| 1. | BCA-22-201 | Digital Electronics and Computer Organization | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 2. | BCA-22-202 | Operating Systems | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 3. | a) BCA-22-203 | Data Structures using C | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | b) BCA-22-203P | Data Structures using C Lab | 0 | 0 | 2 | 15 | 10 | 25 | 75 | 100 | 2 |
| 4. | BCA-ME- 22-204 | Statistical Methods | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | BCA-ME-22- 205 | Entrepreneurship and Innovation | | | | | | | | | |
| 5. | BCA-VC- 22-206 | Business Analytics | 0 | 0 | 3 | 15 | 10 | 25 | 75 | 100 | 3 |
| 6. | CC-2 | First Aid and Health | 2 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 2 |
| **Total** | | | | | | | | | | **700** | **27** |

**CT**: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/ Tutorial/ Practical

**Course Structure**
**for**

**BCA (BACHELOR OF COMPUTER APPLICATION) – SECOND YEAR**
**(Effective from Session 2022-23)**

## THIRD SEMESTER

| S. No. | SubjectCode | Subject Name | Periods | | | Sessional | | | ESE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | | | |
| 1. | BCA-22-301 | Computer Networks | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 2. | BCA-22-302 | Discrete Mathematics | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 3. | a) BCA-22-303 | Object Oriented Programming using C++ | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | b) BCA-22-303P | Object Oriented Programming using C++Lab | 0 | 0 | 2 | 15 | 10 | 25 | 75 | 100 | 2 |
| 4. | BCA-ME-22-304 | Basics of Accounting and Finance | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | BCA-ME-22-305 | E-Commerce | | | | | | | | | |
| 5. | BCA-VC-22-306 | Web Design | 0 | 0 | 3 | 15 | 10 | 25 | 75 | 100 | 3 |
| 6. | CC-3 | Human Values and Environment Studies | 2 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 2 |
| **Total** | | | | | | | | | | **700** | **27** |

**CT**: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/ Tutorial/ Practical

## FOURTH SEMESTER

| S. No. | SubjectCode | Subject Name | Periods | | | Sessional | | | ESE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | | | |
| 1. | BCA-22- 401 | Design and Analysis of Algorithms | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 2. | BCA-22- 402 | Management Information Systems | 6 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 6 |
| 3. | a) BCA-22- 403 | Database Management System | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | b) BCA-22- 403P | Database Management System Lab | 0 | 0 | 2 | 15 | 10 | 25 | 75 | 100 | 2 |
| 4. | BCA-ME-22-404 | Organisational Behaviour | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | BCA-ME-22-405 | Business Economics | | | | | | | | | |
| 5. | BCA-VC-22-406 | Digital Marketing | 0 | 0 | 3 | 15 | 10 | 25 | 75 | 100 | 3 |
| 6. | CC-4 | Physical Education and Yoga | 2 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 2 |
| **Total** | | | | | | | | | | **700** | **27** |

**CT**: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/ Tutorial/ Practical

**Course Structure**
**for**
## BCA (BACHELOR OF COMPUTER APPLICATION) – THIRD YEAR
**(Effective from Session 2022-23)**

### FIFTH SEMESTER

| S. No. | SubjectCode | Subject Name | Periods | | | Sessional | | | ESE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | | | |
| 1. | BCA-22-501 | Software Engineering | 5 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 5 |
| 2. | BCA-22-502 | OptimizationTechniques | 5 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 5 |
| 3. | BCA-22-503 | Fundamentals of Artificial Intelligence | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| 4. | a) BCA-22-504 | Java Programming | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | b) BCA-22-504P | Java Programming Lab | 0 | 0 | 2 | 15 | 10 | 25 | 75 | 100 | 2 |
| 5. | BCA-IF-22-505 | Project- ONE | 0 | 0 | 3 | 15 | 10 | 25 | 75 | 100 | 3 |
| 6. | CC-5 | Analytical ability and Digital Awareness | 2 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 2 |
| **Total** | | | | | | | | | | **700** | **25** |

**CT**: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/ Tutorial/ Practical

### SIXTH SEMESTER

| S. No. | SubjectCode | Subject Name | Periods | | | Sessional | | | ESE | Total | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | CT | TA | Total | | | |
| 1. | BCA-22-601 | Cloud Computing | 5 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 5 |
| 2. | BCA-22-602 | Cyber Security | 5 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 5 |
| 3. | BCA-22-603 | Introduction to Data Sciences | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| 4. | a) BCA-22-604 | Python Programming | 4 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 4 |
| | b) BCA-22- 604P | Python Programming Lab | 0 | 0 | 2 | 15 | 10 | 25 | 75 | 100 | 2 |
| 5. | BCA- IF-22-605 | Project- TWO | 0 | 0 | 3 | 15 | 10 | 25 | 75 | 100 | 3 |
| 6. | CC-6 | Communication Skill and Personality Development | 2 | 0 | 0 | 15 | 10 | 25 | 75 | 100 | 2 |
| **Total** | | | | | | | | | | **700** | **25** |

**CT**: Class Test **TA**: Teacher Assessment **L/T/P**: Lecture/ Tutorial/ Practical

## PROGRAMME OUTCOMES FOR FIRST SEMESTER COURSES

| S. No | Programme Outcomes | BCA-22-101 | BCA-22-102 | BCA-22-103 | BCA-22-103P | BCA-ME-22-104 | BCA-ME-22-105 | BCA-VC-22-106 | CC-1 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Generic and domain Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | Problem Analysis | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| 3 | Design/Development of Solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | Conduct Investigation of Complex Problem | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| 5 | Modern Tools Usages | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 6 | Ethics | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| 7 | Individual & Team Work | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 8 | Communication | | ✓ | | | ✓ | ✓ | | ✓ |
| 9 | Project Management | | | ✓ | ✓ | | | | |
| 10 | Life Long Learning | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |

**Legend:**

| | |
|---|---|
| BCA-22-101 | Fundamentals of Mathematics |
| BCA-22-102 | Emerging Information Technologies |
| BCA-22-103 | Programming in C |
| BCA-22-103P | Programming in C Lab |
| BCA-ME-22-104 | Management Principles |
| BCA-ME-22-105 | Intellectual Property Rights |
| BCA-VC-22-106 | Office Automation |
| CC-1 | Food, Nutrition and Hygiene |

## PROGRAMME OUTCOMES FOR SECOND SEMESTER COURSES

| S. No | Programme Outcomes | BCA-22-201 | BCA-22-202 | BCA-22-203 | BCA-22-203P | BCA-ME- 22-204 | BCA-ME-22- 205 | BCA-VC- 22-206 | CC-2 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Generic and domain Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | Problem Analysis | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3 | Design/Development of Solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | Conduct Investigation of Complex Problem | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | Modern Tools Usages | ✓ | | | | | ✓ | ✓ | ✓ |
| 6 | Ethics | | | | | | ✓ | | ✓ |
| 7 | Individual & Team Work | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| 8 | Communication | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 9 | Project Management | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 10 | Life Long Learning | | ✓ | | | ✓ | ✓ | ✓ | ✓ |

**Legend:**

| | |
|---|---|
| BCA-22-201 | Digital Electronics and Computer Organization |
| BCA-22-202 | Operating Systems |
| BCA-22-203 | Data Structures using C |
| BCA-22-203P | Data Structures using C Lab |
| BCA-ME- 22-204 | Statistical Methods |
| BCA-ME-22- 205 | Entrepreneurship and Innovation |
| BCA-VC- 22-206 | Business Analytics |
| CC-2 | First Aid and Health |

## PROGRAMME OUTCOMES FOR THIRD SEMESTER COURSES

| S. No | Programme Outcomes | BCA-22- 301 | BCA-22- 302 | BCA-22- 303 | BCA-22- 303P | BCA-ME-22-304 | BCA-ME-22-305 | BCA-VC-22-306 | CC-3 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Generic and domain Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | Problem Analysis | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3 | Design/Development of Solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | Conduct Investigation of Complex Problem | | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| 5 | Modern Tools Usages | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 6 | Ethics | | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| 7 | Individual & Team Work | | | ✓ | ✓ | ✓ | | | ✓ |
| 8 | Communication | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| 9 | Project Management | ✓ | | ✓ | ✓ | | ✓ | ✓ | |
| 10 | Life Long Learning | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |

**Legend:**

| | |
|---|---|
| BCA-22-301 | Computer Networks |
| BCA-22-302 | Discrete Mathematics |
| BCA-22-303 | Object Oriented Programming using C++ |
| BCA-22-303P | Object Oriented Programming using C++ Lab |
| BCA-ME-22-304 | Basics of Accounting and Finance |
| BCA-ME-22-305 | E-Commerce |
| BCA-VC-22-306 | Web Design |
| CC-3 | Human Values and Environment Studies |

## PROGRAMME OUTCOMES FOR FOURTH SEMESTER COURSES

| S. No | Programme Outcomes | BCA-22- 401 | BCA-22- 402 | BCA-22- 403 | BCA-22- 403P | BCA-ME-22-404 | BCA-ME-22-405 | BCA-VC-22-406 | CC-4 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Generic and domain Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | Problem Analysis | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3 | Design/Development of Solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | Conduct Investigation of Complex Problem | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | Modern Tools Usages | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 6 | Ethics | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 7 | Individual & Team Work | | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| 8 | Communication | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 9 | Project Management | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| 10 | Life Long Learning | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Legend:**

| | |
|---|---|
| BCA-22- 401 | Design and Analysis of Algorithms |
| BCA-22- 402 | Management Information Systems |
| BCA-22- 403 | Database Management System |
| BCA-22- 403P | Database Management System Lab |
| BCA-ME-22-404 | Organisational Behaviour |
| BCA-ME-22-405 | Business Economics |
| BCA-VC-22-406 | Digital Marketing |
| CC-4 | Physical Education and Yoga |

## PROGRAMME OUTCOMES FOR FIFTH SEMESTER COURSES

| S. No | Programme Outcomes | BCA-22- 501 | BCA-22- 502 | BCA-22- 503 | BCA-22- 504 | BCA-22- 504P | BCA-IF-22- 505 | CC-5 |
|---|---|---|---|---|---|---|---|---|
| 1 | Generic and domain Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | Problem Analysis | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 3 | Design/Development of Solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | Conduct Investigation of Complex Problem | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | Modern Tools Usages | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 6 | Ethics | ✓ | | ✓ | | | ✓ | ✓ |
| 7 | Individual & Team Work | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 8 | Communication | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 9 | Project Management | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 10 | Life Long Learning | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Legend:**

| | |
|---|---|
| BCA-22-501 | Software Engineering |
| BCA-22-502 | OptimizationTechniques |
| BCA-22-503 | Fundamentals of Artificial Intelligence |
| BCA-22-504 | Java Programming |
| BCA-22-504P | Java Programming Lab |
| BCA-IF-22-505 | Project- ONE |
| CC-5 | Analytical ability and Digital Awareness |

## PROGRAMME OUTCOMES FOR SIXTH SEMESTER COURSES

| S. No | Programme Outcomes | BCA-22-601 | BCA-22-602 | BCA-22-603 | BCA-22-604 | BCA-22- 604P | BCA- IF-22-605 | CC-6 |
|---|---|---|---|---|---|---|---|---|
| 1 | Generic and domain Knowledge | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2 | Problem Analysis | ✓ | | ✓ | ✓ | ✓ | ✓ | |
| 3 | Design/Development of Solution | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 4 | Conduct Investigation of Complex Problem | | | ✓ | ✓ | ✓ | ✓ | |
| 5 | Modern Tools Usages | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 6 | Ethics | | ✓ | | | | ✓ | |
| 7 | Individual & Team Work | | | | ✓ | ✓ | ✓ | ✓ |
| 8 | Communication | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| 9 | Project Management | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 10 | Life Long Learning | | | | ✓ | ✓ | ✓ | ✓ |

**Legend:**

| | |
|---|---|
| BCA-22-601 | Cloud Computing |
| BCA-22-602 | Cyber Security |
| BCA-22-603 | Introduction to Data Sciences |
| BCA-22-604 | Python Programming |
| BCA-22- 604P | Python Programming Lab |
| BCA- IF-22-605 | Project- TWO |
| CC-6 | Communication Skill and PersonalityDevelopment |

| Semester I | BCA-22-101: Fundamentals of Mathematics |
|---|---|
| Credit – 6 | LTP: 6:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Define and illustrate the concepts related to Mathematics | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Make use of the knowledge of mathematics for examining various theorems | L – 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Determine the effectiveness of different theorems and construct effective solution for mathematical problems | L -5<br>L –6 | Evaluating<br>Creating |

| Semester I | BCA-22–102: Emerging Information Technologies |
|---|---|
| Credit – 6 | LTP: 6:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Learn fundamental concepts of Computer, Algorithm, Flowchart and Computer Software | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Apply concepts of Computer Software to analyze working of Computer | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Create different Algorithms and Flowcharts to evaluate functioning of Computer | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester I | BCA-22-103: Programming in C |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts of C Programming | L - 1<br>L - 2 | Understanding<br>Remembering |
| CO 2 | Apply and analysis the real-world problems using C programming concepts | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Build the solution of the real-world problems and evaluate it as per industry standards | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester I | BCA-22–103P: Programming in C Lab |
|---|---|
| Credit – 2 | LTP: 0:0:2 |

**Course Outcomes:** On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Memorise and outline the concepts of C Programming | L - 1<br>L - 2 | Understanding<br>Remembering |
| CO 2 | Plan and analyse the real-world problems using C programming concepts | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Create the solution of the real-world problems and improve it as per industry standards | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester I | BCA-ME-22-104: Management Principles |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Comprehend the meaning and horizon of management principles and conceptualize the development of management thoughts | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Analyze various management concepts and apply them to real-world management challenges | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate various strategic frameworks and develop strategies to tackle real-world company challenges | L – 5<br>L – 6 | Evaluating<br>Creating |

| Semester I | BCA-ME-22-105: Intellectual Property Rights |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the basic concept of Intellectual Property Rights | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Analyze different aspect of Intellectual property right and apply these concepts within the organization | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate different regulatory framework pertaining to IPR and create report for the organization accordingly | L – 5<br>L – 6 | Evaluating<br>Creating |

| Semester I | BCA-VC-22-106: Office Automation |
|---|---|
| Credit – 3 | LTP: 0:0:3 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Spell and Illustrate fundamental concepts of MS Office | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Utilize and categorize basic features of MS Office | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Select and Create word document, Spreadsheet and presentation using MS office | L - 5<br>L - 6 | Evaluating<br>Creating |

| Programme: B.C.A. | Year: First | Semester: First |
|---|---|---|
| Subject: Computer Applications | | |
| Course Code: CC-1 | Course Title: Food, Nutrition and Hygiene | |

**Course Objective:** The objective of this course is to learn the basic concept of the Food and Nutrition, nutritive requirement during special conditions, meal planning, Nutrition Concept, common health issues in the society and special requirement of food during common illnesses.

**Course Outcomes:** On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to food and nutrition. | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply principles of nutritive requirement during normal and special conditions and analyse related health issues. | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the system of meal planning and create effective plans and strategies towards Nutrition requirements. | L – 5<br>L – 6 | Evaluating<br>Creating |

| Semester II | BCA-22-201: Digital Electronics & Computer Organization |
|---|---|
| Credit- 6 | LTP: 6:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand Gates and their operations are performed by computers | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Apply and analyze operations of Combinational and Sequential circuit | L -3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate various types of memory, its applications and operation of Memory Organization | L -5<br>L- 6 | Evaluating<br>Creating |

| Semester II | BCA-22-202: Operating Systems |
|---|---|
| Credit- 6 | LTP: 6:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Understand fundamental operating system abstractions such as processes, threads, files, semaphores, shared memory regions, etc. | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Analyze important algorithms for process scheduling and memory management | L –3<br>L –4 | Applying<br>Analyzing |
| CO 3 | Categorize the operating system's resource management techniques, dead lock management techniques, memory management techniques | L –5<br>L - 6 | Evaluating<br>Creating |

| Semester II | BCA-22– 203: Data Structures Using C |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | List down and extend the concepts related to Data Structures | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Choose the knowledge of data structures to inspect various programme | L – 3<br>L - 4 | Applying<br>Analyzing |

| | | | |
|---|---|---|---|
| CO 3 | Evaluate the effectiveness of types of data structures and create effective solutions for data structure programme | L -5<br>L –6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester II** | **BCA-22– 203P: Data Structure Using C Lab** |
| **Credit – 2** | **LTP: 0:0:2** |

**Course Outcomes:** On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Data Structures | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of data structures to analyze various programme | L – 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of types of data structures and create effective solutions for data structure programme | L -5<br>L –6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester II** | **BCA-ME-22-204: Statistical Methods** |
| **Credit – 4** | **LTP: 4:0:0** |

**Course Objective:** The course aims to familiarize the learners with the basic statistical methods used to summarize and analyze quantitative information for making decision in different situations in real life problems.

**Course Outcomes:** On successful completion of the course the learner will be able to:

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Define and illustrate the basic concepts of statistics | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of statistics for solving various problems and analyze/interpret the intricacies involved in decision making based on statistics | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of statistics in particular situations and create effective decision criteria on the basis of information | L – 5<br>L – 6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester -- II** | **BCA-ME-22-205: Entrepreneurship & Innovation** |
| **Credit– 4** | **LTP : 4:0:0** |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand different dimensions of Entrepreneurship, Innovation , Incubation & Design Thinking for Startups | L –1<br>L -2 | Remembering<br>Understanding |
| CO 2 | Analyze and apply the dimensions of Entrepreneurship, Innovation , Incubation & Design Thinking in changing situations | L –3<br>L –4 | Applying<br>Analyzing |
| CO 3 | Evaluate different aspects and updates in the current Entrepreneurship, Innovation , Incubation & Design Thinking Ecosystem and create a startup plan | L -5<br>L -6 | Evaluating<br>Creating |

| **Semester II** | **BCA-VC-22-206: Business Analytics** |
|---|---|
| **Credit – 3** | **LTP: 0:0:3** |

**Course Outcomes:** On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Business Analytics and R Programming Environment. | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Apply fundamentals of business analytics using R and R Studio & analyze real-time business data. | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate real-time business data and create suitable visualizations charts to draw inferences to facilitate managerial decision-making. | L - 5<br>L - 6 | Evaluating<br>Creating |

| **Programme: B.C.A.** | **Year: First** | **Semester: Second** |
|---|---|---|
| **Subject: Computer Applications** | | |
| **Course Code: CC-2** | **Course Title: First Aid and Health** | |

Course Objectives: The objective of this course is to impart skills needed to assess the ill or injured person, provide CPR to infants, children and adults, handle emergencies, navigate difficult questions responsibly and to identify Mental Health status and Psychological First Aid.

Course Outcomes: On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to first aid and health. | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply principles of first aid and health and analyze first aid principles as applied to real life. | L – 3<br>L – 4 | Applying<br>Analyzing |

| | | | |
|---|---|---|---|
| | | | |
| CO 3 | Evaluate the first aid systems as applicable to general and emergency situations and create effective first aid procedures to deal with exigencies. | L – 5<br>L – 6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester III** | **BCA-22-301: Computer Networks** |
| **Credit-6** | **LTP: 6:0:0** |

**Course Objective:** To familiarize the students with the evolution of communication through network, their fundamentals and standard models communication between machines in a network and the protocols of the various layers.

**Course Outcomes:** On successful completion of the course learner will be able to

| COs | Course Outcomes | Cognitive Levels | Bloom Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Computer Network | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of Computer Network to analyze various protocols | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of layer design and create effective solutions for network related issues | L – 5<br>L – 6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester III** | **BCA-22-302: Discrete Mathematics** |
| **Credit – 6** | **LTP: 6:0:0** |

**Course Objective:** To extend student's logical and mathematical maturity and ability to deal with abstraction. Also introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Discrete mathematics | L –1<br>L -2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of Discrete Mathematics to analyze various problems | L –3<br>L –4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of algebraic structure and create effective solutions for mathematical issues | L –5<br>L - 6 | Evaluating<br>Creating |

| Semester III | BCA-22-303: Object-Oriented Programming Using C++ |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Objective:** The course is designed to provide complete knowledge of Object-Oriented Programming through C++ and to enhance the programming skills of the students to handle the real world problems.

**Course Outcomes:** On successful completion of the course the learner will be able to:

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Understand the difference between the top-down and bottom-up approach and remember the concepts of object-oriented programming | L - 1<br>L - 2 | Understanding<br>Remembering |
| CO 2 | Using Object oriented concept in C++, apply & analyze real-world problems | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Deliver/create the solution of real problems using C++ concepts | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester III | BCA-22-303P: Object-Oriented Programming Using C++ Lab |
|---|---|
| Credit – 2 | LTP: 0:0:2 |

**Course Objective:** The primary objective of this course is to understand the concept of Object Oriented Programming so that the real problems can be solved using C++ Programming language.

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Conceptualize the difference between the top-down and bottom-up approach and remember the concepts of object-oriented programming | L - 1<br>L - 2 | Understanding<br>Remembering |
| CO 2 | Apply and analyze the real-world problems using Object oriented concept in C++ | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Deliver/create the solution of real problems using concepts of C++ | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester III | BCA-ME-22-304: Basics of Accounting and Finance |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to:

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Get well-versed with the accounting concepts, standards and products of financial market. | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of accounting and financial products in analyzing the financial decisions of an enterprise. | L – 3<br>L – 4 | Applying<br>Analyzing |

| | | | |
|---|---|---|---|
| CO 3 | Evaluate the financial market situations to create the appropriate investment strategies for the organization. | L – 5<br>L – 6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester III** | **BCA-ME-22- 305: E-Commerce** |
| **Credit -4** | **LTP: 4:0:0** |

**Course Outcomes:** On successful completion of the course learner will be able to

| COs | Course Outcomes | Cognitive Levels | Bloom Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts to E-Commerce and related technologies | L-1<br>L-2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of E-Commerce technologies for online business and analyze the concept involved in online business | L-3<br>L-4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of E-commerce practices in business and create a digital environment for business world | L-5<br>L-6 | Evaluating<br>Creating |

| | |
|---|---|
| **Semester III** | **BCA-VC-22-306: Web Design** |
| **Credit – 3** | **LTP: 0:0:3** |

**Course Objective:** Students will be able to create website in HTML, CSS, JS, PHP and Word press.

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Recall and demonstrate the basics of web development framework | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Build and classify the fundamental concepts of HTML, CSS, JS, PHP in website development | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Recommend the various parameters required for designing websites | L - 5<br>L - 6 | Evaluating<br>Creating |

| **Programme: B.C.A.** | **Year: Second** | **Semester: Third** |
|---|---|---|
| **Subject: Computer Applications** | | |
| **Course Code: CC-3** | **Course Title: Human Values and Environmental Studies** | |

Course Objectives: The objective of this course is to create morally articulate solutions to be truthful and just and to become responsible towards humanity, to establish a continuous interest in the learners to improve their thought process with intent to develop a new generation of responsible citizens capable of addressing complex challenges faced by the society due to disruptions in human interactions effecting human values.

Course Outcomes: On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive | Blooms Taxonomy |
|---|---|---|---|

| | | Levels | |
|---|---|---|---|
| CO 1 | Remember and understand basic principles of Human Values and Environmental Studies. | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply core concepts of human values and business ethics and analyze how it works in organizational environment. | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate applicability of human value issues in organizations and create a model of human value for implementation in organizations. | L – 5<br>L – 6 | Evaluating<br>Creating |

| **Semester IV** | **BCA- 22-401 : Design and Analysis of Algorithms** |
|---|---|
| **Credit-6** | **LTP: 6:0:0** |

**Course Objective:** To teach the students demonstrate performance of algorithms with respect to time and space complexity.

**Course Outcomes:** On successful completion of the course the learner will be able to

| **COs** | **Course Outcomes** | **Cognitive Levels** | **Blooms Taxonomy** |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to algorithm | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of algorithm to analyze various source code | L – 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of algorithm and create effective solutions for source code | L -5<br>L –6 | Evaluating<br>Creating |

| **Semester IV** | **BCA- 22-402: Management Information Systems** |
|---|---|
| **Credit-6** | **LTP: 6:0:0** |

**Course Objective:** This course is designed for students to understand MIS in both the wider managerial context and in the narrower confines of the selection, support, design and development of computer applications. It also focuses on the concepts which students needs to understand, in order to make effective use of computerized information systems.

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand and concepts and tools related to the MIS | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of MIS to enhance business effectiveness and analyze the different perspectives of MIS in organisational set-up | L -3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the relevance and role of MIS in different spheres of business and create information system to facilitate the decision making process | L-5<br>L-6 | Evaluating<br>Creating |

| **Semester IV** | **BCA- 22-403: Database Management System** |
|---|---|
| **Credit-4** | **LTP: 4:0:0** |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes: | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Recall and Outline the basic principles of DBMS and Logical Diagram for small databases | L –1<br>L -2 | Remembering<br>Understanding |
| CO 2 | Choose the concept of DBMS to Database Recovery and Inspect the Database Processes | L –3<br>L –4 | Applying<br>Analyzing |
| CO 3 | Evaluate Query and Build Database using basic commands of MySQL | L –5<br>L - 6 | Evaluating<br>Creating |

| **Semester IV** | **BCA-22- 403P: Database Management System Lab** |
|---|---|
| **Credit-2** | **LTP: 0:0:2** |

**Course Objective:** To teach the students fundamental concepts of database management system.

**Course Outcomes:** On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Define and Explain the basic concepts of database technologies | L –1<br>L -2 | Remembering<br>Understanding |

| | | | |
|---|---|---|---|
| CO 2 | Apply and analyze database schema for a given problem-domain | L –3<br>L –4 | Applying<br>Analyzing |
| CO 3 | Assess the querying of a database using SQL DML/DDL commands and construct integrity constraints | L –5<br>L - 6 | Evaluating<br>Creating |

| **Semester IV** | **BCA-ME-22-404: Organisational Behavior** |
|---|---|
| **Credit- 4** | **LTP 4:0:0** |

**Course Outcomes:** After completing the course, the student shall be able to:

| **COs** | **Course Outcomes** | **Cognitive Levels** | **Blooms Taxonomy** |
|---|---|---|---|
| CO 1 | Remember and Summarise the concept of Organizational Behavior | L – 1<br>L – 2 | Remember<br>Understand |
| CO 2 | Utilise and Discover different Personal attributes of Organizational Behavior based on Attitude, Perception and Learning | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate and different theories and create best practices to be followed in an organization | L – 5<br>L – 6 | Evaluating<br>Creating |

| **Semester IV** | **BCA-ME-22-405: Business Economics** |
|---|---|
| **Credit– 4** | **LTP: 4:0:0** |

**Course Outcomes:** On successful completion of the course the learner will be able to

| **COs** | **Course Outcomes** | **Cognitive Levels** | **Blooms Taxonomy** |
|---|---|---|---|
| CO 1 | Remember and understand the relevance of economics for a business firm | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Analyze the different laws of economics and apply them in various changing situations in industry | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the different market structures leading towards creation of a business and economy as a whole | L – 5<br>L – 6 | Evaluating<br>Creating |

| **Semester IV** | **BCA-VC-22-406: Digital Marketing** |
|---|---|
| **Credit – 3** | **LTP: 0:0:3** |

**Course Outcomes:** On successful completion of the course the learner will be able to

| **COs** | **Course Outcomes** | **Cognitive Levels** | **Blooms Taxonomy** |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to digital marketing | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of digital marketing to solve related marketing problems and analyze the intricacies involved in | L - 3<br>L - 4 | Applying<br>Analyzing |

| | | | |
|---|---|---|---|
| | digital marketing. | | |
| CO 3 | Evaluate the effectiveness of alternatives available for digital marketing in particular marketing situations and create effective digital marketing plan and strategy. | L - 5<br>L - 6 | Evaluating<br>Creating |

| **Programme: B.C.A.** | **Year: Third** | **Semester: Fourth** |
|---|---|---|
| **Subject: Computer Applications** | | |
| **Course Code: CC-4** | **Course Title: Physical Education and Yoga** | |

Course Objective: Students will learn the introduction of Physical Education, Concept of fitness and wellness, Weight management and lifestyle of an individual. The student will also learn about the relation of Yoga with mental health and value Education. In this course student will also learn about the aspects of the Traditional games of India.

Course Outcomes: On successful completion of the course the learner will be able to-

| **COs** | **Course Outcomes** | **Cognitive Levels** | **Blooms Taxonomy** |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Physical Education and Yoga. | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of Physical Education and Yoga to self and analyze the intricacies involved in application of Physical Education and Yoga. | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of Physical Education and Yoga programs and create effective Physical Education and Yoga schedules. | L – 5<br>L – 6 | Evaluating<br>Creating |

| Semester V | BCA-22-501: Software Engineering |
|---|---|
| Credit-5 | LTP: 5:0:0 |

**Course Objective:** To demonstrate the students with the role of Software Engineering and Methodologies required in Software Industry.

**Course Outcomes:** On Successful completion of the course the learner will be able to

| COs | Course Outcome | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Software engineering | L-1<br>L-2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of SDLC and Analyze a problem for Requirement Engineering Process | L-3<br>L-4 | Applying<br>Analyzing |
| CO 3 | Evaluate the correctness and readability of software and Create Software design with specification documentation | L-5<br>L-6 | Evaluating<br>Creating |

| Semester V | BCA-22 -502: Optimization Techniques |
|---|---|
| Credit-5 | LTP: 5:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Conceptualize the role of Optimization techniques and relate different techniques of optimization | L –1<br>L -2 | Remembering<br>Understanding |
| CO 2 | Choose different optimization techniques in solving various problems and inspect the optimal solution | L –3<br>L –4 | Applying<br>Analyzing |
| CO 3 | Determine the real-world problems and formulate optimal solution using different Optimization techniques | L –5<br>L - 6 | Evaluating<br>Creating |

| Semester V | BCA-22-503: Fundamentals of Artificial Intelligence |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Understand fundamentals of Artificial Intelligence and Machine Learning | L - 1<br>L - 2 | Remembering<br>Understanding |
| CO 2 | Use various algorithms of Artificial Intelligence for simplification of problems | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate functioning of different algorithms of Artificial Intelligence | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester V | BCA-22-504: Java Programming |
|---|---|
| Credit – 4 | LTP: 4:0:0 |

**Course Objective:** The primary objective of this course is to understand the concept of Object Oriented Programming so that the real problems can be solved using JAVA Programming language.

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember the Java Programming Concepts to understand the real problems | L - 1<br>L - 2 | Understanding<br>Remembering |
| CO 2 | Apply and analyze the real-world problems using Java programming | L - 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Build the solution of real problems using Java Programming concepts and evaluate it | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester: V | BCA- 22-504P: Java Programming Lab |
|---|---|
| Credit – 2 | LTP: 0:0:2 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember the Java Programming Concepts to understand the real problems | L - 1<br>L - 2 | Understanding<br>Remembering |
| CO 2 | Apply and analyze the real-world problems using Java programming | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Create the solution of real problems using Java Programming concepts and evaluate it | L - 5<br>L - 6 | Evaluating<br>Creating |

| Semester V | BCA-IF-22-505: Project -ONE |
|---|---|
| Credit – 3 | LTP: 0:0:3 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to software | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of technical languages to analyze various programme | L – 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of software and create effective solution for real-time technical problems | L -5<br>L –6 | Evaluating<br>Creating |

| Programme: B.C.A. | Year: Third | Semester: Fifth |
|---|---|---|
| **Subject: Computer Applications** | | |
| **Course Code: CC-5** | **Course Title: Analytical Ability and Digital Awareness** | |

Course Objectives: The course aims to familiarize students with analogy, number system, set theory and its applications, number system and puzzles, understand the basics of Syllogism, figure problems, critical and analytical reasoning, familiarize with word processing application and worksheet, understand the basics of web surfing and cyber security.

Course Outcomes: On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Analytical Ability and Digital Awareness | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of Analytical Ability and Digital Awareness to solve business problems and analyze the intricacies involved in Analytical Ability and Digital Awareness. | L – 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of alternative Analytical Ability and Digital Awareness plans and strategies in particular situations and create effective plans and strategies for Analytical Ability and Digital Awareness. | L – 5<br>L – 6 | Evaluating<br>Creating |

| Semester VI | BCA-22-601 : Cloud Computing |
|---|---|
| Credit – 5 | LTP: 5:0:0 |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | List & Infer the concept of cloud computing over various cloud computing platforms | L - 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Choose & Discover the trade-offs between deploying applications in the cloud and over the local infrastructure | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Judge the cloud computing performance & Formulate the concept of upgrade performance matrices for underlying cloud technologies and software. | L – 5<br>L - 6 | Evaluate<br>Create |

| Semester VI | BCA-22-602: Cyber Security |
|---|---|
| Credit-5 | LTP: 5:0:0 |

**Course Objective:** To understand the philosophy of cyber security, its remedies and the techniques used to protect information system. To understand the cyber laws and its current practices that are applied to provide cyber security.

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes: | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts of cyber security | L-1<br>L-2 | Remembering<br>Understanding |
| CO 2 | Apply various techniques of cyber security to protect information system from cyber-attacks and analyze the intricacies involved in maintaining cyber security | L-3<br>L-4 | Applying<br>Analyzing |
| CO 3 | Evaluate the importance of cyber security and create secure information system. | L-5<br>L-6 | Evaluating<br>Creating |

| **Semester - VI** | **BCA -22– 603 – Introduction to Data Sciences** |
|---|---|
| **Credit – 6** | **LTP: 6:0:0** |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Conceptualise the basics of Data Science & its application | L - 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Utilise & Test the concept of AI and ML to modern day's business functions | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Measure & Formulate the Data Analytics concept in real-time data science application | L – 5<br>L - 6 | Evaluate<br>Create |

| **Semester VI** | **BCA-22-604: Python Programming** |
|---|---|
| **Credit– 4** | **LTP: 4:0:0** |

**Course Outcomes:** On successful completion of the course the learner will be able to:

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Recall & Summarise the basic concepts of Python Programming language | L - 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Use the python programming syntax for Examining the real-time problems | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Appraise the various Complex programming paradigm using python & also propose the real-time application using it | L – 5<br>L - 6 | Evaluate<br>Create |

| **Semester VI** | **BCA-22-604P: Python Programming Lab** |
|---|---|
| **Credit– 2** | **LTP: 0:0:2** |

**Course Outcomes:** On successful completion of the course the learner will be able to:

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Conceptualise the basics of python Programming | L - 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Applying & Analyzing the python programs with conditionals, loops & function. | L - 3<br>L – 4 | Applying<br>Analyzing |
| CO 3 | Evaluate and Test different Python programs step-wise using functions and other paradigm | L – 5<br>L - 6 | Evaluate<br>Create |

| **Semester VI** | **BCA-IF-22-605: Project -TWO** |
|---|---|
| **Credit – 3** | **LTP: 0:0:3** |

**Course Outcomes:** On successful completion of the course the learner will be able to

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to software | L –1<br>L –2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of technical languages to analyze various programme | L – 3<br>L - 4 | Applying<br>Analyzing |
| CO 3 | Evaluate the effectiveness of software and create effective solutions for real-time technical problems | L -5<br>L –6 | Evaluating<br>Creating |

| **Programme :B.C.A.** | **Year: Third** | **Semester: Sixth** |
|---|---|---|
| **Subject: Computer Applications** | | |
| **Course Code: CC-6** | **Course Title: Communication Skills and Personality Development** | |

Course Objective: This course has an objective to groom the personality of students from various possible domains.

Course Outcomes: On successful completion of the course the learner will be able to-

| COs | Course Outcomes | Cognitive Levels | Blooms Taxonomy |
|---|---|---|---|
| CO 1 | Remember and understand the concepts related to Communication Skills and Personality Development | L – 1<br>L – 2 | Remembering<br>Understanding |
| CO 2 | Apply the knowledge of Communication Skills and Personality Development to solve business problems and analyze the intricacies involved in Communication Skills and Personality Development | L – 3<br>L – 4 | Applying<br>Analyzing |

| | | | |
|---|---|---|---|
| CO 3 | Evaluate the effectiveness of alternative Communication Skills and Personality Development plans and strategies in particular situations and create effective Communication Skills and Personality Development plans and strategies. | L – 5<br>L – 6 | Evaluating<br>Creating |