# Government Bikram College of Commerce

# Patiala-147001

# Program Outcomes and Course Outcomes of BCA

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# Programme andCourse Outcome

BCA

# Program Outcomes (POs)

**PO-1:** Identify, formulate, review and analyze complex problems using various techniques.

**PO-2:** Communicate effectively on complex activities and with the society at large and write effective documentation, make effective presentation and give and receive clear instructions.

**PO-3:** Function effectively as an individual, and as a member or leader or project manager in project team.

**PO-4:** Recognize the needs for, and have the preparation and ability to engage in independent and lifelong learning.

**PO-5:** Development of analytical, programming and logical skills.

## Course Outcomes (COs)

**BCA - I**
**Semester-1st**

| Code | Course |
|---|---|
| BCA-111 | General English – I |
| BCA-112 | Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) ** |
| BCA-113 | Fundamentals of Information Technology |
| BCA-114 | Programming Fundamentals using C |
| BCA-115 | Software Lab –I (Windows and Office Automation) |
| BCA-116 | Software Lab – II (Based on paper BCA-114: Programming Fundamentals using C) |

**Semester-2nd**

| Code | Course |
|---|---|
| BCA-121 | General English – II |
| BCA-122 | Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) ** |
| BCA-123 | Digital Electronics |
| BCA-124 | Data Structures |
| BCA-125 | Basic Mathematics |
| BCA-126 | Software Lab – III (based on BCA-124: Data Structures) |
| BCA-127 | Drug Abuse : Problem, Management and Prevention*** |

## BCA-111: General English – I

**After completion of this course, students will be able to:**

**CO-1:** Generate their competence of both active and passive elements of theEnglish language i.e., writing and speaking and listening and reading.

**CO-2:** Deepen their understanding of accurate usage of English grammar in writingand speaking.

**CO-3:** Enlarge their vocabulary by keeping a vocabulary lexicon.

**CO-4:** Learn to transform their native language into the target language.

**CO-5:** Learn to write accurate English essays and letters.

**CO-6:** Enhance their confidence by having translation drills and through speakingEnglish practice sections.


## BCA-112: Punjabi (Compulsory)

**After completion of this course, students will be able to:**

**CO-1:** ਭਾਸ਼ਾਈ ਸੰਰਚਨਾ ਦੇ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਉਸਦੀ ਵਰਤੋਂ ਰੋਜ਼ਾਨਾ ਜ਼ਿੰਦਗੀ ਵਿੱਚ ਕਰਨਾ

**CO-2:** ਭਾਸ਼ਾ ਦੇ ਜਰੀਏ ਮਨੁੱਖੀ ਭਾਵਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਨ ਦੇ ਯੋਗ ਹੋਣਾ

**CO-3:** ਗੁਰਮੁਖੀ ਲਿਖੀ ਦੇ ਭਾਸ਼ਾਈ ਵਿਕਾਸ ਦੇ ਵਿਭਿੰਨ ਪੜਾਵਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਚੇਤਨਾ

**CO-4:** ਮਨੁੱਖੀ ਹੋਂਦ ਦੇ ਸੰਕਟਾਂ ਦੀ ਨਿਸ਼ਾਨਦੇਹੀ ਅਤੇ ਉਹਨਾਂ ਦਾ ਯੋਗ ਹੱਲ ਲੱਭਣਾ

**CO-5:** ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

# BCA-113: Fundamentals of Information Technology

**Upon the completion of the course the learner will be able to**

**CO-1**: Familiarization with the types of computer, peripheral devices, memorymanagement, multimedia and number system.

**CO-2**: Learn about working of various input and output devices.

**CO-3**: Learnt about binary number representation along with its operations.

**CO-4**: Understand theoretical framework of internet and associated application of the internet.

**CO-5**: Acquire the knowledge about the binary number representation along with its operations.

**CO-6**: Understand of the role of computers in business, education and society.

# BCA-114: Programming Fundamentals Using C

**After completion of this course, students will be able to:**

**CO-1**: Understand of various concepts of programming language.

**CO-2**: Develop logics and analytical ability solve problem.

**CO-3**: Learn about procedural programming using functions.

**CO-4**: Acquired various flow control statements.

**CO-5**: Learn about various storage classes along with user defined data types.

**CO-6:** Acquire knowledge of file handling

**CO-7**: Work with arrays of complex structure data types.

**CO-8**: Understanding a concept of functional hierarchical code organization.

## BCA-115: Software Lab-I

**After completion of this course, students will be able to:**

**CO-1:** Have basic knowledge of computer Hardware and Software.

**CO-2:** Understand business areas to which computers may be applied.

**CO-3:** Installation of Operating System (Windows), application software and to use Windows OS.

**CO-4:** Provide practical knowledge to Office tools (MS Word, Excel and PowerPoint).

**CO-5:** Use of MS-Word to type documents with various formatting.

**CO-6:** Creating and manipulating Datasheets for different applications.

**CO-7:** Designing effective presentations using Power Point software.


## BCA-116: Software Lab-II

**COURSE OUTCOMES**

**After completion of this course, students will be able to:**

**CO-1:** Design algorithms and flowchart to solve programming problems.
**CO-2:** Write, compile and debug programs in C language. Use different data types,operators and console I/O function in a computer program.
**CO-3:** Design programs involving decision control statements, loop control statements and case control structures.
**CO-4:** Understand the implementation of arrays, pointers and functions and applythe dynamics of memory by the use of pointers.
**CO-5:** Comprehend the concepts of structures and union: declaration, initializationand implementation.
**CO-6:** Use the file operations, character I/O, string I/O, file pointers, andcreate/update basic data files.

## BCA-121: General English-II

### COURSE OUTCOMES

**After completion of this course, students will be able to:**

**CO-1:** Enhance their competence in writing and speaking skills to the next level.

**CO-2:** Make use of new lexical terms after going through verbs, adjectives and idioms.

**CO-3:** Learn to write with the accurate use of Active and Passive voices aftercompleting the taught exercises by the teacher.

**CO-4:** Start writing in the reported speech that usually confuses the learner. The conversion of Direct Speech to Indirect Speech will create a crystal clarity to the learners.

**CO-5:** Learn different type of sentences e.g. Affirmative, Negative, Interrogative, Assertive, Exclamatory and so on.

**CO-6:** The next level drills of the translation will help the students to create new complex sentences from their mother tongue to the target language.


## BCA-122: Punjabi
## (Compulsory)

### COURSE OUTCOMES

**After completion of this course, students will be able to:**

**CO-1:** ਰੂਪਾਕਾਰ ਨਿਬੰਧ ਰਾਹੀਂ ਜ਼ਿੰਦਗੀ ਦੀਆਂ ਤਲਖ਼ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਣਾ

**CO-2:** ਵਪਾਰਕ ਪੱਤਰ ਵਿਹਾਰ ਰਾਹੀਂ ਵਪਾਰਕ ਪੱਧਰ 'ਤੇ ਸਮਰੱਥ ਹੋਣਾ

**CO-3:** ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਨ ਦੀ ਯੋਗਤਾ

**CO-4:** ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ

**CO-5:** ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

# BCA-123: Digital Electronics

**COURSE OUTCOMES**

**After completion of this course, students will be able to:**

**CO-1:** Acquire knowledge about Analog and Digital Systems and various digital logicgates.

**CO-2:** Distinguish between various number systems and their conversions and computer arithmetic.

**CO-3:** Develop K-Maps representation and simplification logic functions up to 4variables.

**CO-4:** Understand, analyze and design various combinational and sequential circuitssuch as encoders, decoders and counters using multiplexers, and flip – flops.

**CO-5:** Describe analog to digital and digital to analog conversion circuits.

# BCA-125: Basic Mathematics

**COURSE OUTCOMES**

**After completion of this course, students will be able to:**

**CO-1:** Understand the concept and solve complex numbers and quadratic equations.

**CO-2:** Understand and use of co-ordinate geometry in modern scientific computing.

**CO-3:** Apply Matrices and Determinants for solving problems appropriate problems.

**CO-4:** Familiar with representation of floating point number system, arithmeticoperation and errors in normalized floating point numbers.

**CO-5:** Solve transcendental and simultaneous algebraic equations using differentmethods under different parameters.

## BCA-124: Data and File Structures & BCA-126: Software Lab-III (based on BCA-124)

**After completion of this course, students will be able to:**

**CO-1:** Be familiar with basic data structure and algorithms.
**CO-2:** Design and analyze programming problem statements
**CO-3:** Choose appropriate data structures and algorithms and use it to designalgorithms for a specific problem.
**CO-4:** Handle operations like searching, insertion, deletion and traversing mechanism
**CO-5:** Come up with analysis of efficiency and proofs of correctness

## BCA-127: Drug Abuse: Problem, Management and Prevention***

**COURSE OUTCOMES**

**After completion of this course, students will be able to:**

**CO-1:** Understand the extent of the problem of Drug Abuse and its prevalence.

**CO-2:** Differentiate Drug Abuse from Drug Dependence and Drug Addiction.

**CO-3:** Gain conceptual understanding about Drug tolerance and examine the difference between Physical and Psychological dependence on drugs.

**CO-4:** Identify short and long term effects and withdrawal symptoms of drugs like stimulants, depressants: Alcohol, Barbiturates, Narcotics, hallucinogens, steroids and Inhalants.

**CO-5:** Analyze the nature of the problem of Drug abuse by learning about vulnerable age groups, Physical, academic, behavioral and Psychological indicators.

**CO-6:** Evaluate the Physiological, Psychological and Sociological causes of drug abuse along with its consequences for individuals, families, society and the nation.

**CO-7:** Understand the overview of Management and Prevention of Drug Abuse by visiting a Drug De-addiction Centre. The students will also be able to assess the role of Family, School, Media, Legislation and De-addiction Centers in combating the menace of Drug Abuse.

**B. C.A - II**
**Semester-III**

| Code | Course |
|------|--------|
| BCA-211 | English Communication Skills – I |
| BCA-212 | Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan)** |
| BCA-213 | Discrete Mathematics |
| BCA-214 | Computer System Organization and Architecture |
| BCA-215 | Object Oriented Programming using C++ |
| BCA-216 | Fundamentals of Database Management System |
| BCA-217 | Software Lab – IV (Object Oriented Programming using C++ Lab) |
| BCA-218 | Software Lab – V (DBMS using MS Access Lab) |

**Semester-4th**

| Code | Course |
|------|--------|
| BCA-221 | English Communication Skills – II |
| BCA-222 | Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) ** |
| BCA-223 | Computer Networks |
| BCA-224 | Management Information Systems |
| BCA-225 | Computer Oriented Numerical and Statistical Methods |
| BCA-226 | Relational Database Management Systems with Oracle |
| BCA-227 | Software Lab – VI (Computer Oriented Numerical and Statistical Methods Lab) |
| BCA-228 | Software Lab – VII (Oracle Lab) |
| BCA-229 | Environmental and Road Safety Awareness (Qualifying Exam) |

**BCA-211: English Communications Skills - I**
**COURSE OUTCOMES**
**After completion of this course, students will be able to: CO-1:**
Write with competency with a critical and creative insight.
**CO-2:** The taught prescribed literature book Prose Parable will be an insightful source for

the students that will help them in understanding social and moral philosophy.

**CO-3:** Start forming new dialogues with the given paragraphs that will give them new dimensions to their foresight and creativity.

**CO-4:** Write and speak with accuracy and precision after going through theexercises of error in the sentences.

**CO-5:** The topic 'Curriculum Vitae' taught by the teacher will make the learnerconscious about their earned credentials and the potentials to be generated.

**BCA-212: Punjabi (Compulsory)**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:CO-1:**
ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

**CO-2:** ਰੂਪਾਕਾਰ ਕਹਾਣੀ ਰਾਹੀਂ ਜ਼ਿੰਦਗੀ ਦੀਆਂ ਤਲਖ਼ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਣਗੇ

**CO-3:** ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਨ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਵੇਗੀ

**CO-4:** ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ ਸਿੱਖਣਗੇ

**CO-5:** ਭਾਸ਼ਾਈ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਭਾਸ਼ਾਈ ਸੰਜਮਤਾ ਤੇ ਅਨੁਸ਼ਾਸਨ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਕਰਨਾ

**BCA-213: Discrete Mathematics**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

**CO-1:** Learn the mathematical reasoning and important problem solving skills.

**CO-2:** Understand the basic concepts of Set theory and foundation for imbeddinglogical reasoning in computer science.

**CO-3:** Understand and create mathematical arguments.

**CO-4:** Apply the concept of Graph and tree in practical applications.

**BCA-214: Computer System Organization and Architecture**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

**CO-1:** Understand computer organization and its working, processing of an instruction by the CPU.

**CO-2:** Understand the various other important component of a computer system like Memory, Registers, Arithmetic Logic unit, Control unit, Peripheral devices.

**CO-3** Learn the concepts related with execution of instructions, working of addressing modes, interface and its use in the working of peripheral devices, interrupt signals, direct memory access.

**CO-4:** Learn the concepts related with digital electronics to understand the working of components like logic gates, flip flops, counters, and multiplexers etc., which are used to build components in a computer.

**BCA-215: Object Oriented Programming using C++**
**After the completion of the course the learner will be able to**

**CO-1**: Understand the benefits of Object-Oriented Programming (OOP) as compareto Traditional Programming approach and resolve problem in domain of object- oriented programming.

**CO-2**: Familiarization with a widely range of features of object-oriented programmingusing C++

**CO-3**: Understand Object oriented approach for finding solutions to various problemswith the help of C++ language.

**CO-4**: Understand the concept of polymorphism with the help function overloadingand virtual functions.

**CO-5**: Acquire various types of various types and forms of inheritance.

**CO-6**: Understand basic of generic functions and classes.

### BCA-216: Fundamentals of Database Management System Upon the completion of the course the learner will be able to

**CO-1**: Familiarization with various features and applications of Database Management system.

**CO-2**: Acquire knowledge about database languages (DDL, DML, DCL)

**CO-3**: Learn how to design a database by using different data models.

**CO-4**: Understand the database handling during execution of the transactions alongwith concurrent access.

**CO-5**: Ability to perform various types of SQL queries.

**CO-6**: Able to design a good database using normalization, decomposition andfunctional dependency

### BCA-217: Software Lab – IV (Object Oriented Programming using C++ Lab)
### COURSE OUTCOMES
**After completion of this course, students will be able to:**

**CO-1:** Understand the intricacies of Object Oriented Programming including thefeatures and peculiarities of the C++ programming language.

**CO-2:** Illustrate the concept of Inheritance, operator overloading, and polymorphism.

**CO-3:** Implement various objects oriented concepts to solve practical problems.

**CO-4:** Apply the concepts of OOPs using C++ in programming.

### BCA-218: Software Lab – V (DBMS using MS-Access Lab)
### COURSEOUTCOMES
**After completion of this course, students will be able to:**

**CO-1:** Understand database concepts and importance of database design.

**CO-2:** Understanding the concepts of DMBS architecture.

**CO-3:** Understand the objectives of normalization and what role it plays in the database design process.

**CO-4:** Become proficient in creating and using tables, queries, reports and forms inMS-Access.

**BCA-221: English Communications Skills - II**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**


**CO-1:** Increase their reading rate and cognition of fiction via the novel The Old Manand The Sea.

**CO-2:** Improve their reading fluency skills through extensive reading.

**CO-3:** Enlarge their vocabulary by keeping a vocabulary lexicon while dealing with literature.

**CO-4:** Enhance their level of understanding of sentences after having the revisionsof Narration & Active and Passive voices

**CO-5:** Generate accuracy in writing and speaking skills.


**BCA-222: Punjabi (Compulsory)**
**COURSE OUTCOMES**
**After completion of this course, students will be able to: CO-1:**
ਕਵਿਤਾ ਨੂੰ ਪੜ੍ਹਦਿਆਂ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

**CO-2:** ਕਵਿਤਾ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਕਲਪਨਾ ਸ਼ਕਤੀ ਦਾ ਵਿਕਾਸ ਕਰੇਗੀ

**CO-3:** ਕਵਿਤਾ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀਆਂ ਸ਼ਬਦ ਦੀ ਸਮਰੱਥਾ ਅਤੇ ਪਰਤਾਂ ਬਾਰੇ ਸਹੀ ਅਰਥਾਂ ਵਿੱਚ ਜਾਨਣਗੇ।

**CO-4:** ਗੁਰਮੁਖੀ ਲਿੱਪੀ ਦੀ ਵਿਕਾਸ ਪ੍ਰਕਿਰਿਆ ਬਾਰੇ ਪੜ੍ਹਦੇ ਹੋਏ ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਅਤੇ ਲਿੱਪੀ ਦੇ ਆਪਸੀ ਸਬੰਧਾਂ ਨੂੰ ਸਮਝਣਗੇ

**CO-5:** ਲਿੱਪੀ ਨੂੰ ਸਮਝਣ ਤੋਂ ਬਾਅਦ ਭਾਸ਼ਾ ਦੀ ਸਮਰਥਾ ਪਛਾਨਣ ਦੇ ਯੋਗ ਹੋਣਗੇ


**BCA-223: Computer Networks**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

**CO-1:** Understand the functions of different layers of TCP/IP and OSI reference models.

**CO-2:** Classify of networks-LAN, MAN and WAN.

**CO-3:** Identify and understand various techniques and modes of transmission mediawith real time applications.

**CO-4:** Understand the fundamentals of Network security.


**BCA-224: Management Information System**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

**CO-1:** Understand the concept of information, system, value of information, elementsof a system and role of information system.

**CO-2:** Understand the classification of MIS.

**CO-3:** Experience various stages in the development of MIS and applications of Information Systems in functional areas of MIS.

**CO-4:** Have a clear idea about DSS and its difference from MIS.

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**BCA-225: Computer Oriented Numerical and Statistical Methods & BCA-227:Software Lab – VI (Computer Oriented Numerical and Statistical Methods)**
**After completion of this course, students will be able to:**

**CO-1:** Solve algebraic equations using different methods under different parameters.

**CO-2:** Be familiar with numerical integration and differentiation

**CO-3:** Analyze statistical data using measures of central tendency and dispersion.**CO-4:** Calculate and interpret the methods of correlation and regression analysis. **CO-5:** Implement numerical and statistical methods in C/C++.

**BCA-226: Relational Database Management System with Oracle & BCA-228:Software Lab – VII (Oracle Lab)**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

**CO-1:** Understand the core terminology of Relational Database ManagementSystem.
**CO-2:** Understand and apply the concept of Transaction Processing, ConcurrencyControl Mechanism, and Recovery system in database.
**CO-3:** Comprehend Relational Query Languages.

**CO-4:** Use SQL syntax for Data Administration, Manipulation and to query adatabase to retrieve information.

**BCA-229: Environmental and Road Safety Awareness**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

CO-1: Understand the structure and function of an ecosystem and ecosystem linksbetween environmental components and their role.

CO-2: Recognize the importance of environment and the sustainable of natural resources.

CO-3: Use scientific reasoning to recognize and comprehend environment issuesand evaluate potential solutions.

CO-4: Well versed with environmental protection laws in India. CO-
5: Understand the concept and significance of Road safety.

## Course Outcomes (COs)

**B. C.A - III**
**Semester- 5th**

| Code | Course |
|------|--------|
| BCA-311 | English Literary Skills – I |
| BCA-312 | System Analysis and Design |
| BCA-313 | System Software |
| BCA-314 | Java Programming |
| BCA-315 | Web Designing using HTML and DHTML |
| BCA-316 | Software Lab – IX (based on paper BCA-314: Java Programming) |
| BCA-317 | Software Lab – X (based on paper BCA-315: Web Designing using HTML and DHTML) |
| BCA-318 | Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) ** |

**Semester- 6th**

| Code | Course |
|------|--------|
| BCA-321 | English Literary Skills – II |
| BCA-322 | E-Commerce |
| BCA-323 | Operating Systems |
| BCA-324 | Software Engineering |
| BCA-325 | Web Designing using ASP.NET |
| BCA-326 | Software Lab – XI (More on Java based on BCA-314: Java Programming) |
| BCA-327 | Software Lab – XII (based on BCA-325: Web Designing usingASP.NET) |
| BCA-328 | Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) ** |

**BCA -311: English Literary Skills – I**
**COURSE OUTCOMES**
**After completion of this course, students will be able to:**

**CO-1**: Attain the intrinsic knowledge of human behaviour by reading Popular ShortStories book.

**CO-2**: By learning new words pertaining to places, trades, church, marriage, arts andscience, the learners will have more knowledge of physical and social entities.

**CO-3**: The grammar book will create accuracy and precision in students' writings and conversation.

**CO-4**: Bring the students to a new advanced level of learning the English language. **CO-5**: The prescribed lists of synonyms and antonyms will make the students morerefined in selecting appropriate words for usage.

## BCA-312: System Analysis and Design
### COURSE OUTCOMES
**After completion of this course, students will be able to:CO-1**:
Understand the term System in the real world.

**CO-2**: Understand all terms and concepts related with the various systems existing.

**CO-3**: Learn Computer functioning as a System.

**CO-4**: Understand all steps related with the creation of a System, starting from its analysis to its design to its implementation including the hardware software selection for the same.

## BCA-313: System Software
### COURSE OUTCOMES
**After completion of this course, students will be able to:**

**CO-1**: Learn and understand the System at the level of the operating system that isSystem software.

**CO-2**: Understand System in terms of the processors, loaders and linkers.

**CO-3**: Learn the working of Compilers as well as their construction and use.

**CO-4**: Knowledge of various software tools like program developers, editors,debuggers and user interfaces.

## BCA-314: Java Programming & BCA-316: Software Lab-IX
**After completion of this course, students will be able to:**

**CO-1**: Design programs involving decision control statements, loop control statements and case control structures.

**CO-2**: Understand the implementation of arrays, and functions and apply thedynamics of memory by the use of memory management schemes.

**CO-3**: Comprehend the concepts of classes and objects: declaration, initializationand implementation.

**CO-4**: Apply basics of object oriented programming, polymorphism and inheritance, Exception Handling, Multithreading.

**CO-5**: Use the file operations, character I/O, string I/O, and create/update basic datafiles.

**CO-6**: Understand and learn the concepts of Applets.

## BCA-315: Web Designing using HTML and DHTML & BCA – 317: Software Lab-X
**After completion of this course, students will be able to:**

**CO-1**: Write and debug webpage using HTML and DHTML languages.

**CO-2**: Knowledge and Use of web publishing and phases related with the website development.

**CO-3**: Make use of knowledge related to links, addresses, images, and tables.**CO-4**: Knowledge of various formatting options on HTML page and web site. **CO-5**: Knowledge of Server Side programming.

**BCA-318: Punjabi Compulsory or Punjabi Compulsory After completion of this course, students will be able to:**

**CO-1**: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਵਿਭਿੰਨ ਸਾਹਿਤਕ ਰੂਪਾਕਾਰਾਂ ਵਿੱਚ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ

**CO-2**: ਵਿਦਿਆਰਥੀ ਤਕਨੀਕ ਦੇ ਦੌਰ ਵਿੱਚ ਹੁੰਦੇ ਹੋਏ ਲੋਕਧਾਰਾਈ ਬੋਧ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰਨਗੇ

**CO-3**: ਵਿਦਿਆਰਥੀਆਂ ਆਪਣੀਆਂ ਪਰੰਪਰਾਵਾਂ ਦਾ ਸਮਕਾਲ ਨਾਲ ਮੇਚਕੇ ਮੁਲਾਂਕਣ ਕਰਨ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ

**CO-4**: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬ ਦੇ ਮੇਲੇ ਅਤੇ ਤਿਉਹਾਰਾਂ ਬਾਰੇ ਵਿਸਥਾਰ ਨਾਲ ਪਤਾ ਲੱਗੇਗਾ

**CO-5**: ਵਿਦਿਆਰਥੀ ਵਿਆਕਰਨ ਨੂੰ ਭਾਸ਼ਾ ਦੇ ਪ੍ਰਯੋਗ ਹਿੱਤ ਕੁਸ਼ਲਤਾ ਨਾਲ ਪ੍ਰਯੋਗ ਕਰਨਗੇ

**BCA-321: English Literary Skills-II**

**After completion of this course, students will be able to:**

**CO-1**: Gain not only innate insight of human behaviour but also the terms of dramaby reading Short Plays book.

**CO-2**: By learning new words referring to death, war, science and nature, thestudents will have supplementary knowledge of material and nature elements.

**CO-3**: The grammar book will create accuracy and precision in students' writings and conversation.

**CO-4**: Bring the students to a new advanced level of learning the English language. **CO-5**: The prescribed figure of speech i.e. verbs, adjectives and adverbs will makethe students more polished in determining proper words for usage.

**BCA-322: E-Commerce**

**After completion of this course, students will be able to:CO-1**:

Understand E-commerce as a process.

**CO-2**: Learn the difference that exist between traditional and latest e-commerce procedures and outcomes.

**CO-3**: Understand the concepts and technologies like internet for implementation ofe-commerce.

**CO-4**: Learn various consumer oriented e-commerce concepts in the form of modelset cetera.

**CO-5**: Knowledge of advertisement and marketing using internet technology.

**BCA-323: Operating Systems**

**After completion of this course, students will be able to:**

**CO-1**: Learn the mechanisms of OS to handle processes and threads and their communication.

**CO-2**: Use different data types, operators and console I/O function in a computer program.

**CO-3**: Learn the mechanisms involved in memory management in contemporary OS. **CO-4**: Gain knowledge on distributed operating system concepts that includes architecture, deadlock detection algorithms and agreement protocols.

**CO-5**: Understand different approaches to memory management.

**CO-6**: Understand the structure and organization of the file system

### BCA-324: Software Engineering

**On completion of this course, the students will be able to:**

**CO-1:** Understand the basic concepts, models, life cycle of software development. **CO-2:** Learn higher level concepts like Re-engineering, Reverse Engineering, Forward Engineering, and CASE tools.

**CO-3:** Knowledge of all the steps of software engineering and their use and implementation in real problems

**CO-4:** Understanding of programming language and using it to develop software using all stages of software development.

### BCA-326: Software Lab-XI

**After completion of this course, students will be able to:**

**CO-1**: Understand the basic concepts related with the development of software. **CO-2**: Ability to develop software both at simple level as well as complex level. **CO-3**: Understand various models for software development.

**CO-4**: Understand the life cycle of a software.

**CO-5**: Learn higher level concepts like Re-engineering, Reverse Engineering, Forward Engineering, CASE tools.

**CO-6**: Knowledge of all the steps of software engineering and their use and implementation in real problems

**CO-7**: Understanding of programming language and using it to develop software using all stages of software development.

### BCA-325: Web Designing using ASP.NET & BCA-327: Software Lab-XII

**After completion of this course, students will be able to:**

**CO-1**: Write, compile and debug programs using ASP.NET language.

**CO-2**: Knowledge and Use of different data types, operators, loops and other control structures in web programming.

**CO-3**: Design programs accepting user inputs and various other standard controls.

**CO-4**: Understand the implementation of arrays, and events.

**CO-5**: Comprehend the concepts of classes and objects: declaration, initialization and implementation.

**CO-6**: Apply the various rich web features like file uploads, debugging, caching and deploying ASP.NET pages et cetera.

**CO-7**: Understand and learn the concepts related with ASP.NET security, localizing ASP.NET

applications.

**CO-8**: Ability to develop programs to implement and use all the above specifiedconcepts and features in programming.

**BCA-328: Punjabi (Compulsory) or Punjabi**

**After completion of this course, students will be able to:CO-1**:
ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤ ਦੇ ਰੂਪਾਕਾਰਾਂ ਵਿੱਚ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ

**CO-2**: ਉਹਨਾ ਅੰਦਰ ਸਾਹਿਤਕ ਅਤੇ ਰਚਨਾਤਮਕ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

**CO-3**: ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਕਰਦੇ ਹੋਏ ਭਾਸ਼ਾਈ ਸਾਂਝਾਂ ਅਤੇ ਵਖਰੇਵਿਆਂ ਬਾਰੇ ਜਾਨਣ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ

**CO-4**: ਰੋਜ਼ਾਨਾ ਜ਼ਿੰਦਗੀ ਵਿੱਚ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

**CO-5**: ਸਿਵਲ ਪ੍ਰੀਖਿਆਵਾਂ ਵਿੱਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਉਹਨਾਂ ਨੂੰ ਮਜਬੂਤ ਆਧਾਰ ਪ੍ਰਦਾਨ ਕਰੇਗਾ