ASIAN EDUCATIONAL INSTITUTE, PATIALA
SCHOOL OF COMPUTER SCIENCE
Syllabi Scheme of BCA – IInd Year Semester – IIIrd
Session 2025-2026 onwards

Sr. No.	Code	Course Type	Title of Paper	L+T	P	External Marks	Internal Marks	Max. Marks	Credits
1.	BCA301T	MAJ CC – 6	Computer Organisation and Architecture	4+0	0	70	30	100	4
2.	BCA302T	MAJ CC – 7	Software Engineering	4+0	0	70	30	100	4
3.	BCA303T	MAJ CC-8	Relational Database Management Systems	4+0	0	70	30	100	4
4.	BCA304P	MAJ LAB-IV	Software Lab – IV (Based on Paper BCA303T)	0	4	35	15	50	2

DISCIPLINE SPECIFIC , SKILL ENHANCEMENT AND VALUE ADDED COURSES

Sr. No.	Code	Course Type	Title of Paper	L+T	P	External Marks	Internal Marks	Max. Marks	Credits
1.	BDSE1T	DSE1	Web Development Using Wordpress	4	0	70	30	100	4
2.	BCA305T	SEC3	Object Oriented Programming Using C++	3	0	70	30	100	3
3.	BCA306P	SEC3 LAB	SEC3 Lab (Based on Paper BCA305T)	0	4	35	15	50	2
4.	BVAC3T	VAC3	Yoga and Meditation	2	0	35	15	50	2
Total Marks						455	195	650	25

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CONTINUOUS ASSESSMENT (THEORY PAPERS)

1. **Two tests will be conducted during the semester** : **60%** of the total marks allotted for continuous assessment.
   Both the tests will be counted for assessment.
2. **Assignment/Quizzes** : **20%** of the total marks allotted for continuous assessment.
3. **Attendance** : **10%** of the total marks allotted for continuous assessment.
4. **Class Participation and behavior** : **10%** of the total marks allotted for continuous assessment.

CONTINUOUS ASSESSMENT (PRACTICAL PAPERS)

1. **Two tests will be conducted during the semester.** : **60%** of the total marks allotted for continuous assessment.
   Both the tests will be counted for assessment.
2. **Lab Assignments** : **20%** of the total marks allotted for continuous assessment.
3. **Attendance** : **10%** of the total marks allotted for continuous assessment.
4. **Practical File** : **10%** of the total marks allotted for continuous assessment.

NOTE: The Chairman of the Committee reserves the discretion to modify the syllabus, subject to changing circumstances or emerging needs.

BOS: 29.07.2025

Pranayama: meaning, definition of pranayama and its types.

BCA301T: MAJ - CC: COMPUTER SYSTEM ORGANISATION AND ARCHITECTURE

Total Marks: 100
External Examination: 70
Internal Assessment: 30
Credits: 4

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60Hrs
L:4 T:0 P: 0

Instructions for the Paper-Setter:
The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will cany 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

Instructions for the Candidates:
Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

Course Outcomes:
- To enable the students to learn the basic functions, principles and concepts of Computer architecture.
- To learn the fundamental aspects of Computer Architecture and design.
- To focus on processor design, control unit design techniques.
- To study on I/O interfacing.

SECTION-A

Computer System Organisation: CPU Organisation, Instruction Execution (instruction cycle, types of instructions), RISC v/s CISC, Design Principles for Modern Computers,Instruction level parallelism. Processor level parallelism.
Primary memory: Memory addresses, Byte Ordering, Error-correcting codes,Cache memory.
Secondary memory: Memory hierarchy, SCSI disk,RAID .
Instruction Set Architecture: Instruction formats. Expanding opcodes, types of addressing modes. data transfer and manipulation instructions, Program control(status-bit conditions, conditional branch instructions, program interrupt, types of interrupt).

SECTION-B

Register Transfer Language: Register Transfer,Bus and memory transfer, Arithmetic micro-operations. Logic micro-operations, Shift micro-operations, Arithmetic logic shift unit.
Micro-programmed control, control word,control memory (concepts only)
Input-output Organisation- I/0 interfaces (I/0 bus and interface modules, I/O versus memory bus, isolated versus memory-mapped I/0).

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Asynchronous Data transfer (strobe control, handshaking), modes of transfer (programmed I/O,interrupt-initiated VO, software considerations),Direct memory access.

Text/Reference Books:

1. Jyotsna Sengupta. Fundamentals of Computer Organization and Architecture. NuTech Books, Deep and Deep Publications. New Delhi.
2. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India.
3. Andrew S. Tannenbaum, "Structured Computer Organisation" 1ª Edition, Prentice Hall.
4. J.P.Hayes Tata McGraw-Hill. Computer Organization and Architecture TMH
5. William Stallings. "Computer System Architecture". PHI



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BCA302T: MAJ - CC: SOFTWARE ENGINEERING

Total Marks: 100
External Examination: 70
Internal Assessment: 30
Credits: 04

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60Hrs
L:4 T:0 P:0

Instructions for Paper-Setter:
The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

Instructions for Candidates:
Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

Course Outcomes:

- To understand the various phases of software development, from requirements gathering to deployment and maintenance.
- To learn,elicit,analyze,specify and validate software requirements.
- Knowledge of various testing techniques, including unit testing, integration testing, and system testing.
- To understand software quality attributes, metrics, and assurance techniques.

SECTION A

Introduction: The Problem Domain, Software Engineering Challenges, Software Engineering Approach, Software development life cycle, its phases Software development process models: Waterfall, Prototyping, Iterative.
Software Process: Characteristics of software process,Project management process,Software configuration management process.
Project Planning: activities,COCOMO model.
Software Metrics: Definition, Importance, Categories of metrics, Software Quality Attributes, Cyclomatic complexity metric.
Software Requirements Analysis: Need for SRS, Data flow diagrams, Data Dictionary, entity relationship diagram.Characteristics and components of SRS, validation, metrics.

SECTION B

Software Design: Design principles, Module-level concepts, Structure Chart and Structured Design methodology,verification, metrics: network metrics, information flow metrics.
Coding: Programming Principles and Guidelines,Verification-code inspections, static analysis.

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Software Testing: testing fundamentals, Black Box Testing: Equivalence class partitioning,Boundary value analysis, cause-effect graphing: White Box Testing Control flow and Data flow based testing, mutation testing: levels of testing, test plan, test case specification, test case execution and analysis.
Software maintenance: Categories of maintenance.
Software Reliability: Definition, uses of reliability studies

Text/References Books:

1. An Integrated approach to Software Engineering: Third Edition 2005. PankajJalote. Narosa Publications.
2. Software Engineering: Revised Second Edition, K.K. Aggarwal, Yogesh Singh, New Age International Publishers.
3. Software Engineering :A Practitioner's Approach, Fifth Edition, Roger. S. Pressman, McGraw Hill

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BCA303T: MAJ - CC: RELATIONAL DATABASE MANAGEMENT SYSTEMS

Total Marks: 100
External Examination: 70
Internal Assessment: 30
Credits: 04

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60Hrs
L:4 T:0 P:0

Instructions for Paper-Setter:
The question paper will consist of three sections A,B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

Instructions for Candidates:
Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

Course Outcomes:

- To give fundamental knowledge database and management system
- To explain the basic concepts of architecture of database.
- To make the learners acquainted with the use of data management issues.

SECTION A

Database Management Systems Definition: Characteristics, Advantages of Using DBMS Approach and disadvantages of traditional file environment systems, Three Schema Architecture, Data Independence Physical and Logical data Independence, Database Administrators and its responsibilities.
Introduction to ER Model: Weak Entity Sets, Strong Entity Sets, mapping cardinalities, generalization, specialization, aggregation.
Relational Database (RDBMS]: The Relational Database Model, Concepts and Terminology. Characteristics of Relations, CODD's 12 rules for a fully RDBMS. Constraints:Integrity Constraints-Entity,Domain and Referential Integrity constraints, Business Rules. Keys-Super Keys,Candidate Keys, Primary Keys, Secondary Keys and Foreign Keys

Relational Algebra: Basic Operations, Additional Operations, Example Queries.
Normalization: Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive Dependency,Normal Forms.

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SECTION-B

Transaction Management: Transaction Concept, ACID Properties. Transaction States. Database Concurrency: Problems of Concurrent databases, Serializability and Recoverability, Concurrency Control Methods Two Phase Locking,Timestamping,Database Recovery: Recovery Concepts, Recovery Techniques-Deferred update, Immediate Update, Shadow Paging.

Introduction to Oracle: Oracle as client server architecture getting started, creating, modifying, and dropping databases.

Tables - Inserting, updating, deleting data from databases, SELECT statement, Data constraints (Null values, Default values, primary, unique and foreign key concepts). Queries for Relational Algebra,Computing expressions, renaming columns, logical operators, range searching, pattern matching. Oracle functions, grouping data from tables in SQL manipulating dates.

Working with SQL: triggers, use of database triggers, types of triggers, how to apply database triggers,BEFORE vs. AFTER triggers, combinations, syntax for creating and dropping triggers.

Text Reference Books:

1. B.P. Desai. "Database management system" BP) publications, New Delhi
2.C.J. Date. "An Introduction to Data Base Systems". Nacosa Publishers
3.Jeffrey D. Ullman. "Principles of Database Systems". Galgotia Pub
4. D. Kroenke. "Database Processing ", Galgotia Publications.
5. Henry F. Korth, "Database System Concepts", MeGraw Hill. Inc.
6. Naveen Prakash, "Introduction to Database Management", TMH

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BCA304P: MAJ LAB : SOFTWARE LAB – IV (BASED ON BCA303T)

Total Marks: 50
External Examination: 35
Internal Assessment: 15
Credits: 2

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60Hrs
L:0 T:0 P: 4

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA303T:(Relational Database Management Systems). Students are required to develop the various programs to understand the concepts and a practical file with internal documentation.

The breakup of marks for the practical will be as under

i.	Internal Assessment	30% Marks
ii.	Viva Voce (External Evaluation)	30% Marks
iii.	Lab Record, Program Development and Execution(External Evaluation)	30% Marks
iv.	Lab Attendance	10% Marks

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BDSE1: DSE:WEB DEVELOPMENT USING WORDPRESS

Total Marks: 100
External Examination: 70
Internal Assessment: 30
Credits: 04

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60Hrs
L:4 T:0 P:0

Instructions for Paper-Setter:
The question paper will consist of three sections A,B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

Instructions for Candidates:
Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

Course Outcomes:
- Understand the core concepts of WordPress, its architecture, and how it functions as a content management system (CMS).
- Master the creation and management of content using posts, pages, categories, and tags.
- Learn to select, install, and customize WordPress themes to create unique website designs.

SECTION - A

Introduction to WordPress: What is WordPress? Features and advantages Self-hosted WordPress.org vs. WordPress.com
Domain and Hosting Basics: What is a domain name? Web hosting overview, Installing WordPress on a local server (XAMPP/WAMP) or live server
Understanding the WordPress Dashboard: Admin interface overview, Posts vs. Pages, Media, Comments, Users, and Settings
Themes and Customization: Installing and activating themes, Customizing themes using WordPress Customizer, Introduction to child themes
Plugins: Installing and activating plugins, Essential plugins (SEO, security, contact form, etc.), Managing and updating plugins
Website Management: Backup and restore, Updates and security best practices, SEO basics and performance optimization

SECTION – B

WordPress Installation: Installing WordPress locally or on a web server
Creating a Basic Website: Setting up homepage and menu, Creating posts and pages, Using categories and tags

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Theme Customization: Editing header, footer, widgets, and sidebar, Using the block editor (Gutenberg)
Using Plugins: Installing plugins like Yoast SEO, Contact Form 7, WPForms, Creating a contact page with forms, Adding a gallery, slider, or portfolio section
Blog and News Section: Setting up a blog page, Creating and managing blog posts, Enabling comments and moderation

Text/Reference Books:

1.Brad Williams, David Damstra, and Hal Stern, Title: Professional WordPress: Design and Development, Publisher: Wiley.
2.JoeCasabona, Title: Building WordPress Themes from Scratch, Publisher: Self-published / Wrox,
.3.Lisa Sabin-Wilson, Title: WordPress All-in-One For Dummies, Publisher: Wiley.
4.Jesse Friedman, Title: WordPress: The Missing Manual, Publisher: O'Reilly Media.

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BCA305T: SEC: OBJECT ORIENTED PROGRAMMING USING C++

Total Marks: 100
External Examination: 70
Internal Assessment: 30
Credits: 04

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60Hrs
L:4 T:0 P:0

Instructions for Paper-Setter:
The question paper will consist of three sections A,B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 30% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 40% marks in all.

Instructions for Candidates:
Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

Course Outcomes:

- To understand the fundamentals of Object-Oriented Programming (OOP).
- To learn C++ syntax and semantics for writing OOP-based code.
- To apply OOP concepts in designing real-world applications.
- Apply object-oriented programming principles to develop modular and reusable code using C++ classes and objects.
- Demonstrate the use of advanced C++ features such as inheritance, polymorphism, and file handling to solve real-world problems.

SECTION A

Unit 1: Introduction to Object-Oriented Programming

- Introduction to OOP vs. Procedural Programming
- Basic concepts of OOP: Class, Object, Encapsulation, Inheritance, Polymorphism, Abstraction
- Structure of a C++ program
- C++ Data types, Variables, Constants, Operators
- Input/output using `cin` and `cout`

Unit 2: Classes and Objects

- Defining and creating Classes and Objects
- Access Specifiers: `public`, `private`, `protected`
- Member Functions and Data Members
- Constructors and Destructors (Default, Parameterized, Copy)
- `this` pointer

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Unit 3: Function Overloading and Operator Overloading

- Function Overloading
- Operator Overloading: Unary and Binary operators
- Friend Functions and Friend Classes

SECTION B

Unit 4: Inheritance

- Types of Inheritance: Single, Multilevel, Multiple, Hierarchical, Hybrid
- Constructor and Destructor in Inheritance
- Overriding member functions
- `protected` access modifier
- Use of `virtual` keyword

Unit 5: Polymorphism and Virtual Functions

- Compile-time and Runtime Polymorphism
- Function Overriding
- Virtual Functions and Pure Virtual Functions
- Abstract Classes
- Virtual Destructors

Unit 6: File Handling and Templates

- File streams: `ifstream`, `ofstream`, `fstream`
- Opening, Reading, Writing, and Closing files
- File modes
- Function Templates and Class Templates

Text/Reference Books:

1. **E. Balagurusamy,** *Title: Object Oriented Programming with C++ Publisher:* McGraw Hill Education
2. **Yashavant Kanetkar,** *Title: Let Us C++, Publisher:* BPB Publications.
3. **Bjarne Stroustrup,** *Title: The C++ Programming Language, Publisher:* Addison-Wesley.
4. **Robert Lafore,** *Title: Object-Oriented Programming in C++, Publisher:* Sams Publishing.
5. **Herbert Schildt,** *Title: C++: The Complete Reference, Publisher:* McGraw Hill.

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Pranayama: meaning, definition of pranayama and its types.

BCA306P:SEC: SEC3 LAB (BASED ON BCA305T)

Total Marks: 50
External Examination: 35
Internal Assessment: 15
Credits: 2

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60 Hrs
L:0 T:0 P: 4

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA305T:(Object Oriented Programming using C++). Students are required to develop the various programs to understand the concepts and a practical file with internal documentation:

The breakup of marks for the practical will be as under

i.	Internal Assessment	30% Marks
ii.	Viva Voce (External Evaluation)	30% Marks
iii.	Lab Record, Program Development and Execution (External Evaluation)	30% Marks
iv.	Lab Attendance	10% Marks

BOS: 29.07.2025

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Asian Educational Institute, Patiala
(An Autonomous College)
All Under Graduate Classes
Semester-III
(2025-2026)
YOGA AND MEDITATION
Paper Code-BVAC-3

ax. Marks:50 Marks
ternal assessment :35 Marks
ctical: 15 Marks

Periods per week: 3
Pass Marks: 35%
Credit : 02 (01T+01P)
45 Hours (Theory: 15 hours, Practical: 30 hours

ourse Objective:

- To understand the Foundation of Yoga.
- To highlight the importance of Yoga and Meditation.
- To provide a general understanding of Asanas, Kriya, Pranayama

Course Outcome:

- Students will be able to understand the Foundation of Yoga
- Students will learn the importance of Yoga and Meditation.
- Students will learn Asanas, Kriya, Pranayama.

nstructions for the Paper Setters

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 6 marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 11 marks in all and will carry 1 mark each.

nstructions for candidates

Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.

Unit I

. Introduction and Foundation of Yoga

. Meaning of yoga and its importance

Ashtanga Yoga- Yama, Niyama, Asanas, Pranyama, Partyahara. Dharana, Dhyana and Samadhi.

Meditation; meaning, definition, types and principles of meditation

Unit II

Principles of yogic practices

Asanas, meaning, definition of asanas and its types.

Pranayama, meaning, definition of pranayama and its types.

4. Kriya; meaning, definition of Kriya and its types.

Internal Assessment:

Performance in mid-semester test	: 06 Marks
Assignment/Project/Seminar	: 06 Marks
Attendance	: 03 Marks

Practical Syllabus

1. Suryanaskar

2. Standing Asanas-vrikshasana, Tadasana

3. Sitting asanas-Padmasana, vrijasana, Paschimuttanana –

4. Lying asanas (supine position)- Halasana, Sarvangasana. Naukasana

5. Prone position asanas -Bhujangasana, Dhanurasna, Navasana

6. Practice of pranayama- bhastrika, kapalbhati, anulom vilom

Text/Reference Books:

1. Brown, F. Y. (2000). How to use yoga. Delhi: Sports Publication

2. Debnath, M. (2006). Basic Core Fitness through yoga and Naturopathy. New Delhi: Sports Publication.

3. Gharote, M. L. & Ganguly, H.(1988). Teaching methods for practices. Lonawala: Kaixydahmoe.

4. Harvey, P. (2001). Yoga for Everybody, New York: Readers Digest

5. Rajjan, S. M. (1985). Yoga strengthening of relaxation for sports

man. New Delhi: Allied Publishers.

nkar, G. (1998). Holistic approach of yoga. New Delhi: Aditya Publishers.

7. Sharma, L. (1991). All You Wanted to Know About Yoga. Greater Noida: Sterling Publisher Pvt. Ltd.

8. Shekar, K. C., (2003). Yoga for health. Delhi: Khel Sahitya Kendra