



**University of Engineering and Management**  
**Institute of Engineering & Management, Salt Lake Campus**  
**Institute of Engineering & Management, New Town Campus**  
**University of Engineering & Management, Jaipur**



**6<sup>th</sup> Semester Syllabus for BCA Admission Batch 2022**

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BCA 2022 Course structure									
SEMESTER 6									
SL NO	TYPES OF COURSE	SUB CODE	SUB NAME	L	T	P	S	TOTAL CONTACT HRS	CREDIT POINTS
THEORY									
1	Computer Science & Application	BCACC601	Artificial Intelligence	3	1	0	0	4	4
2	Computer Science & Application	BCACC602	Cloud Computing	3	1	0	0	4	4
3	Computer Science & Application	BCACC603	Advanced Database and PL/SQL	3	1	0	0	4	4
4	Value Added Course	BCA(GS)601	General studies & current affairs-vi	3	0	0	0	4	2
SESSIONAL									
5	Skill Enhancement	BCA(GS)681	Competitive Aptitude Training-VI	3	0	0	0	4	2
6	Skill Enhancement	BCASE601	Major Project & Grand Viva	6	0	0	0	6	6
MOOCS/MAR/IFC									
7	Value Added Course	MOOCs	Massive Open Online Course	0	0	0	0	0	0
8	Value Added Course	IFC	Industry and foreign certification	0	0	0	0	0	0
9	Value Added Course	MAR	Mandatory Additional Requirements (MAR)	0	0	0	0	0	0
								26	22



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## **Syllabus for BCA Admission Batch 2022**

Subject Name: **Artificial Intelligence**

Credit: 4

Lecture Hours: 40

Subject Code: **BCACC601**

**Pre-requisite:** Knowledge of basic data communication & network security.

Relevant Links:

[Study Materials](#)

[Coursera](#)

[LinkedIn](#)

[MATLAB](#)

### **COURSEOBJECTIVES:**

1. To deliver comprehensive view of Artificial Intelligence
2. To enable the students to understand the Neural Network, Fuzzy Logic and Genetic Algorithms
3. To understand the design issues and working of each components of AI.
4. To familiarize with the benefits and issues regarding AI.

### **COURSEOUTCOMES:**

**CO1:** To provide a strong foundation of fundamental concepts in Artificial Intelligence

**CO2:** To provide a basic exposition to the goals and methods of Artificial Intelligence

**CO3:** To enable the student to apply these techniques in applications which involve perception, reasoning and learning.

**CO4:** Understand the various searching techniques, constraint satisfaction problem and example problems- game playing techniques.

Module number	Topic	Chapter Name	Sub-topics	Mapping with Industry and International Academia	Lecture Hours
1	What is Artificial Intelligence  Heuristic Search Techniques	Part 1:Chapter1, Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair)  Part 1:Chapter3, Artificial Intelligence (Third Edition) <u>Elaine Rich, Kevin Knight, Shivashankar B. Nair</u>	1.1 The AI Problems 1.2 The Underlying Assumption 1.3 What is an AI Technique 1.4 The level of the Model 1.5 Criteria for Success 1.6 Some General References  3.1 Generate-and-Test 3.2 Hill Climbing 3.3 Best- first Search 3.4 Problem Reduction	<i>International Academia:</i> ( <a href="#">Vertex AI with Gemini 1.5 Pro and Gemini 1.5 Flash   Google Cloud</a> ) <i>Industry Mapping:</i> Vertex AI	5
2	Game Playing  Natural Language Processing	Part3:Chapter12,Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair  Part3:Chapter15,Artificial Intelligence (Third Edition) <u>Elaine Rich, Kevin Knight, Shivashankar B. Nair</u>	12.1 Overview 12.2 The Minimax Search Procedure 12.3 Adding Apha-beta Cutoffs  15.1 Introduction 15.2 Syntactic Processing 15.3 Semantic Analysis 15.5 Statistical Natural Language Processing 15.6 Spell Checking	<i>International Standards:</i> ( <a href="#">Vertex AI Agent Builder   Google Cloud</a> )  <i>IndustryMapping:</i> Vertex AI agent Builder	10

3	<p><b>Connectionist Models</b></p> <p><b>Fuzzy Logic Systems</b></p>	<p><b>Part 3:Chapter 18, Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair</b></p> <p><b>Part 3:Chapter 22, Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair</b></p>	<p>18.1 Introduction: Hopfield Networks 18.2 Learning in Neural Networks 18.3 Applications of Neural Networks 18.4 Recurrent Networks 18.5 Distributed Representations</p> <p>22.1 Introduction 22.2 Crisp Sets 22.3 Fuzzy Sets 22.4 Some Fuzzy Terminology 22.5 Fuzzy Logic Control 22.8 <math>\alpha</math> Cut Threshold</p>	<p><b>International Standards:</b> (<a href="#">AI &amp; Machine Learning Products &amp; Services   Google Cloud</a>)</p> <p><b>Industry Mapping : AI and machine learning products:</b> Gemini 1.5 models, the latest and most advanced multimodal models in Vertex AI</p>	10
4	<p><b>Genetic Algorithms: Copying Nature's Approaches</b></p> <p><b>Prolog-The Natural Language for Artificial Intelligence</b></p>	<p><b>Part 3:Chapter 23, Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair</b></p> <p><b>Part 3:Chapter 25, Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair</b></p>	<p>23.1 A Peek into the Biological World 23.2 Genetic Algorithms (GAs) 23.3 Significance of the Genetic Operators</p> <p>25.1 Introduction 25.2 Converting English to Prolog Facts and Rules 25.3 Goals 25.4 Prolog Terminology 25.5. Variables 25.6 Control Structures 25.7 Arithmetic Operators</p>	<p><b>International Standards:</b> (<a href="#">Gemini Code Assist: an AI coding assistant   Google Cloud</a>)</p> <p><b>Industry Mapping: Industry Mapping:</b> Gemini Code Assist, AI assisted application development.</p>	10

**TEXTBOOK:**

1. Artificial Intelligence (Third Edition) Elaine Rich, Kevin Knight, Shivashankar B. Nair

**REFERENCEBOOKS:**

1. Neural Networks,Fuzzy Systems,and Evolutionary Algorithms,Synthesis and Applications,S.Rajasekaran.G.A.Vijayalakshmi Pai, PHI



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## **Syllabus for BCA Admission Batch 2022**

Subject Name: **Cloud Computing**  
Subject Code: **BCACC602**

**Credit: 6**

**Lecture Hours: 60**

**Pre-requisite:** Basics of Computer fundamentals and networking.

### **Relevant Links:**

[Study Materials](#)

[Coursera](#)

[LinkedIn Learning](#)

[Infosys Springboard](#)

[NPTEL](#)

### **COURSE OBJECTIVES:**

1. Understand the principles of cloud computing.
2. Understanding SaaS, PaaS etc.
3. To gain knowledge of applications of cloud computing.
4. To understand cloud computing platforms.
- 5.

### **COURSE OUTCOMES:**

**CO 1:** Understand the fundamentals and foundations of Cloud Computing.

**CO 2** Idea about the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing.

**CO 3:** Understand the key concepts of virtualization and use of hypervisors, explain the core issues of cloud computing such as security, privacy, etc.

**CO 4:** Gain knowledge about the different Cloud computing services and cloud service providers, Gain knowledge about cloud servers and cloud storage



Contents				
Modules	Serial of Modules	Mapping with Industry and International Academia	Hours	CO Mapping
<b>Module 1: Introduction</b>	Cloud Computing at a Glance ,The Vision of Cloud Computing ,Defining a Cloud ,Cloud Computing Reference Model ,Characteristics and Benefits, Distributed Systems ,Virtualization ,Web 2.0 ,Service Oriented Computing ,Utility Oriented Computing ,Eras of Computing ,Parallel vs Distributed Computing ,Elements of Parallel Computing , ,Hardware Architectures of Parallel Processing ,Approaches to Parallel Programming ,Levels of Parallelism ,Laws of Caution ,Elements of Distributed Computing ,Architectural Styles for Distributed Computing ,Models for Inter Process Communication ,Technologies for Distributed Computing ,Remote Procedure Call ,Distributed Object Framework ,Service Oriented Computing	<i>International Academia:</i> <a href="https://aws.amazon.com/free/">https://aws.amazon.com/free/</a> <i>Industry Mapping:</i> Aneka	16	CO1,CO2
<b>Module 2: Virtualization</b>	Characteristic of Virtualized Environments, Execution Virtualization, Other types of Virtualization, Virtualization and Cloud Computing, Pros and Cons of Virtualization, IAAS, PAAS, SAAS Types of Clouds and Security	<i>International Academia:</i> <a href="https://aws.amazon.com/free/">https://aws.amazon.com/free/</a> <i>Industry Mapping:</i> Aneka	14	CO2,CO3,C O4
<b>Module 3: Principles of Parallel and Distributed Computing</b>	Concurrent Computing with Thread Programming, High-throughput Computing and Data-Intensive Computing, Programming applications with Threads, Thread API, Parallel computation with Threads, Task computing, Task Computation with High-Throughput, Task Introduction, Frameworks for Task computing, Task-based application model, Data-intensive computing Characteristics	<i>International Academia:</i> <a href="https://aws.amazon.com/free/">https://aws.amazon.com/free/</a> <i>Industry Mapping:</i> Aneka	16	CO4,CO5

<b>Module 4: Edge, Fog computing and application of cloud of computing</b>	Edge computing, Fog computing, Cloud Platforms and Applications, Overview on Amazon Web Services (AWS), Overview of Google Cloud Platform (GCP), Overview of Microsoft Azure Cloud, Cloud applications in scientific, business and consumer domain	<i>International Academia:</i> <a href="https://aws.amazon.com/free/">https://aws.amazon.com/free/</a> <i>Industry Mapping:</i> Aneka	14	CO6
	<b>Total:</b>		<b>60</b>	
	<b>List of Books</b> <b>Text Books:</b>			
<b>Name of Author</b>	<b>Title of the Book</b>	<b>Name of the Publisher</b>		
Buyya, Vecciola and Selvi	Mastering Cloud Computing : Foundations and Application Programming	Tata McGraw Hill		<a href="#">eBook Content</a>
	<b>Reference Books:</b>			
Aravind Doss	Cloud Computing	Tata McGraw Hill		



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## **Syllabus for BCA Admission Batch 2022**

Subject Name: **Advanced Database and PL/SQL**

Credit: 4

Lecture Hours: 40

Subject Code: **BCACC603**

**Pre-requisite:** Fundamental DBMS knowledge

### **Relevant Links:**

[Study Material](#)

[Coursera](#)

[LinkedIn Learning](#)

[NPTEL](#)

### **COURSE OBJECTIVES:**

1. To gain knowledge of advanced database management ideas.
2. To gain knowledge of concurrency control and recovery management procedures.
3. To gain skill to write database programs using SQL or PL/SQL.

### **COURSE OUTCOMES:**

1. Understand the concept of Database transactions management.
2. Understand the concept of concurrency control techniques and recovery management.
3. Gain idea about distributed DBMS.
4. To gain skill to write PL -SQL.

Module No	Topic	Sub Topic	Chapter Name	Mapping with Industry and International Academia	Lecture Hours	Corresponding Lab Assignment
MODULE 1	QUERY PROCESSING AND OPTIMIZATION	15.1 Overview 15.2 Measures of Query Cost 15.3 Selection Operation 15.4 Sorting 15.5 Join Operation	Chapter 15 – Query Processing	<i>International Academia:</i> <a href="#">Lecture 9: Query Optimization   Database Systems   Electrical Engineering and Computer Science   MIT Open CourseWare</a>	8	
		16.1 Overview 16.2 Transformation of Relational Expressions 16.3 Estimating Statistics of Expression Results 16.4 Choice of Evaluation Plans 16.5 Materialized Views	Chapter 16 -Query Optimization			
MODULE 2	TRANSACTION MANAGEMENT	17.1 Transaction Concept 17.2 A Simple Transaction Model 17.3 Storage Structure 17.4 Transaction Atomicity and Durability 17.5 Transaction Isolation 17.6 Serializability 17.7 Transaction Isolation and Atomicity 17.8 Transaction Isolation Levels 17.9 Implementation of Isolation Levels 17.10 Transactions as SQL Statements	Chapter 17 -Transactions	<i>International Academia:</i> <a href="#">Lecture 10: Transactions and Locking   Database Systems   Electrical Engineering and Computer Science   MIT OpenCourseWare</a>	10	

		18.1 Lock-Based Protocols 18.2 Deadlock Handling 18.3 Multiple Granularity 18.4 Insert Operations, Delete Operations, and Predicate Reads 18.5 Timestamp-Based Protocols 18.6 Validation-Based Protocols	Chapter 18- Concurrency Control			
		19.1 Failure Classification 19.2 Storage 19.3 Recovery and Atomicity 19.4 Recovery Algorithm	Chapter 19 Recovery System			
<b>MODULE 3</b>	PARALLEL AND DISTRIBUTED DATABASES	20.1 Overview 20.2 Centralized Database Systems 20.3 Server System Architectures 20.4 Parallel Systems 20.5 Distributed Systems	Chapter 20 Database-System Architectures	<b>International Academia:</b> <a href="#">Lecture 17: Parallel Databases   Database Systems   Electrical Engineering and Computer Science   MIT OpenCourseWare</a>	10	
		23.1 Distributed Transactions 23.2 Commit Protocols 23.3 Concurrency Control in Distributed Databases 23.4 Replication 23.5 Extended Concurrency Control Protocols	Chapter 23 Parallel and Distributed Transaction Processing			
<b>MODULE 4</b>	PL/SQL	1. Advantage of PL/SQL 2. The Generic PL/SQL Block 3. The PL/SQL Execution Environment 4. PL/SQL 5. Control Structure	Chapter 15 Introduction to PL/SQL	<b>International Academia:</b> 1. <a href="#">PL/SQL Optimization and Tuning (oracle.com)</a> 2. <a href="#">2174ch02final.qxd (oracle.com)</a>	10	1. Write a PL/SQL block to calculate the incentive of an employee whose ID is 110. Sample table: employees  2. Write a PL/SQL block to show an invalid case-insensitive reference to a quoted and without quoted user-defined identifier.
		1. Oracle Transactions	Chapter 16 PL/SQL			3. Write a program in PL/SQL to

		2. Processing a SQL Block 3. What is a Cursor	Transactions			find the number of rows effected by the use of SQL%ROWCOUNT attributes of an implicit cursor
		1. PROCEDURES 2. ORACLE PACKAGES 3. TRIGGERS	Chapter 18 PL/SQL Database Objects			4. Write a code in PL/SQL to create a trigger that prevents updates on a certain column during specific hours of the day.

### TEXT BOOK:

1. Database System Concepts, *Seventh Edition*, [Avi Silberschatz](#), Henry F. Korth, [S. Sudarshan](#)
2. Sql, pl/sql the programming language of oracle by [Bayross, Ivan](#), 4<sup>th</sup> Revised Edition

.

### REFERENCE BOOKS:

1. An Introduction to Database Systems 8e By C J Date
2. [PL/SQL for Developers | Oracle India](#)