

Syllabi Scheme of BCA/BCA Honors (3+1 under NEP 2020)

Session 2026-27

BCA – III SEMESTER – 5

Sr. No.	Code	Course Type	Title of Paper	L+T	P	External Marks	Internal Marks	Max. Marks	Credits
1	BCA501T	MAJOR	Generative AI	4+0	0	70	30	100	3
2	BCA502P		Software Lab-V (Generative AI)	0	2	35	15	50	1
3	BCA503T	DSE	Web Technologies (Theory)	3	0	70	30	100	3
4	BCA504P		Software Lab-IV(Web Technologies)	0	2	35	15	50	1
5	BCA505T	DSE	Introduction To Data Science	4	0	70	30	100	4
6	BCA506T	DSE	AI for Everyone	4	0	70	30	100	4
7	BCA507T	SEC	Python Programming	3	0	70	30	100	3
8	BCA508P	SEC LAB	SEC Lab (Python Programming)	0	4	70	30	100	2
9			Internship	0	0	100	0	100	4
Total Marks						590	210	800	25



Amans Yadwinder Singh

BCA SEMESTER-V

(SESSION:2026-27)

BCA501T: MAJOR: Generative AI

Total Marks: 100

Maximum Time: 3 Hours

External Examination: 70

Minimum Pass Marks: 35%

Internal Assessment: 30

Lectures to be delivered: 55-60 Hours

Credits: 3

L: 3 T: 0 P: 0

A) 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 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.

B) Instructions for the candidates

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory questions of Section C.
2. Use of non-programmable scientific calculators is allowed.

Course Outcomes:

After learning the course, the students should be able to:

1. Understand the evolution of AI and the significance of Deep Learning.
2. Apply various Neural Network architectures for tasks like image recognition and sequence modeling.
3. Analyze data preprocessing and training techniques for neural networks.
4. Design practical solutions using advanced neural networks for diverse applications



Amans
Arora
Yashwinder Singh

BCA - V
Generative

Section A

Generative AI Introduction and Applications: Introduction Applications in Various Fields : Art and Creativity, Image and Video Generation, Text Generation, Music Composition, Healthcare Finance. Real-world use cases and challenges in deploying generative AI models Probability and Statistics, Data Preprocessing Techniques, Model Training Techniques

Foundations: AI/ML basics, Python, and deep learning concepts like CNNs, RNNs, and transformers.

Core Models: GANs, VAEs, and LLMs such as BERT and GPT for text, image, and code generation.

Advanced Neural Network Architectures: Introduction to advanced architectures, Introduction to Generative AI Models: Generative Adversarial Networks (GANs), variational Autoencoders (VAEs), Transformers, Attention Mechanism in detail Long Short-Term Memory Networks (LSTMs).

Section B

Foundations of AI and Neural Networks: History and evolution of AI/ML, Deep learning revolution, Transfer learning, History of Neural Natural Language Processing, Structure of Artificial Neural Networks, Steps in Training an Artificial Neural Network, Parameters and Hyperparameters, Backpropagation

Data Preprocessing: Probability and Statistics, Data Preprocessing techniques, model training techniques.

Text/Reference Books:

1. Generative Deep Learning by David Foster
2. Deep Learning by Ian Goodfellow, Yoshua Bengio, Aaron Courville
3. Natural Language Processing with Transformers by Lewis Tunstall, Leandro von Werra, Thomas Wolf
4. The LLM Engineering Handbook by Paul Iusztin and Maxime Labonne
5. AI Engineering by Chip Huyen



Amang
Yashwinder Singh
Heav

BCA502P: MAJOR: Software Lab V(Generative AI)

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 1

Maximum Time: 3 Hours

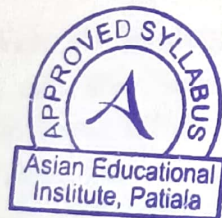
Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L:0 T:0 P:2

List of Practicals

1. Explore and compare different Generative AI tools.
2. Create prompts for text generation tasks.
3. Generate summaries, reports, and presentations using AI tools.
4. Use AI tools for code generation and debugging.
5. Generate images using AI image generation platforms.
6. Create AI-generated audio and video content.
7. Design role-based prompts for specific tasks.
8. Develop a simple AI chatbot using no-code tools.
9. Integrate an AI API into a sample application.
10. Automate a workflow using AI tools.
11. Create an AI-powered content generation project.
12. Develop a mini project using Generative AI tools and platforms.

*h**Amang.**Yadwinder Singh*

BCA503T:Web Technologies

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 3

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L:3 T:0 P:2

A) 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 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.

B) Instructions for the candidates

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory questions of Section C.
2. Use of non-programmable scientific calculators is allowed.

Section A

Introduction to Web Technologies & HTML: Introduction to Internet and World Wide Web, Web Browsers and Web Servers, Client-Server Architecture, Introduction to HTML5, HTML Document Structure, HTML Elements and Attributes, Headings, Paragraphs, Lists, Hyperlinks, Images, Tables, Forms

Cascading Style Sheets (CSS): Introduction to CSS, Types of CSS, Inline CSS, Internal, CSS, External CSS, CSS Selectors, Colors and Backgrounds, Fonts and Text Styling, Box Model, Borders, Margins and Padding, Display Properties, Positioning

Section B

Introduction to JavaScript Fundamentals: Introduction to JavaScript, Variables and Data Types, Operators, Control Statements, Loops, Functions, Arrays, Objects, String Methods

Advanced JavaScript & DOM: Document Object Model (DOM), DOM Manipulation

Text/Reference Books:

1. **Web Technologies:HTML:TCP/IP to internet application** by Achyut S.Godbole.



Amang
Indu
Arora

2. **HTML and CSS:**Design and Build Websites
3. Web Technologies by Uttam K.RoyDevelopment.
4. JavaScript & JQuery:Interactive Front-End Web **Jon Duckett.**



A handwritten signature in blue ink, appearing to be "VW".

A handwritten signature in blue ink, appearing to be "Gaur".

A handwritten signature in blue ink, appearing to be "Amans".

A handwritten signature in blue ink, appearing to be "Yadwinder kaur".

BCA504P: DSE: Software Lab IV(Web Technologies)

Total Marks: 50

External Examination: 35

Internal Assessment: 15

Credits: 1

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L:0 T:0 P:2

List of Practicals

Here is the list of the programs shown in your images/code:

1. Basic HTML Web Page
2. Student Registration Form
3. College Timetable using HTML Table
4. Responsive Flexbox Layout.
5. Navigation Bar using CSS.
6. Addition Calculator using JavaScript.
7. Student Grade Calculator
8. Form Validation using JavaScript
9. To-Do List using JavaScript.
10. Personal Portfolio Website.

These are the program names corresponding to the code you shared.



Aravind

Aravind

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 4

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L: 4 T: 0 P: 0

Course Outcomes:

- Understand how to clean, transform, and preprocess data for analysis.
- Create effective visualizations to communicate data insights.
- Apply machine learning algorithms to solve real-world problems.
- Understand how to develop and evaluate data models to predict outcomes.
- Able to communicate data insights effectively to stakeholders.

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 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 the Candidates

Candidates are required to attempt five questions in all selecting two questions from each section A and B and compulsory question of section C.

SECTION- A

Introduction to Data Science: Meaning of Data Science, Relationship between Big Data and Data Science, Benefits and uses of data science and big data. Facets of data: Structured versus Unstructured data, natural language, machine-generated data, graph-based data, audio, image and video data.

Data Science Process: Goal setting, retrieving data, data preparation, data cleansing and transformation, exploratory data analysis, data visualization, Model building and performance evaluation, presentation. Data set and its features,

Meaning of the terms: observations and variables, Discrete and continuous variables, quantitative and qualitative variables, dependent and independent variables.

Variables classified on scale: Nominal, Ordinal, Interval and Ratio variables.

SECTION-B

Data Visualization and Presentation: What is visualization, Benefits of data visualization, Visual elements: Charts—histograms, scatter plots, time series plots, Graphs, 3D Visualization



✓

Amang
Kishu
Kishuinder Singh

10/28
11/28



and Presentation; Techniques of data visualization in data science: Univariate and bivariate techniques, Tools of data Visualization.

Dimensionality reduction: Principle of parsimony, Feature selection methods: forward selection and back-ward selection procedure, stepwise selection procedure.

Splitting the dataset: Printing versus testing datasets, Concepts of overfitting and under-fitting.

Data Science and Ethical Issues: Discussions on privacy, security, ethics.

Text/Reference Books:

- S.J. Russell and P. Norvig: *Artificial Intelligence: A Modern Approach*, Pearson.
- Sinan Ozdemir, *Principles of Data Science*, Packt Publishing.
- E. Rich, K. Knight, S.B. Nair: *Artificial Intelligence*, Tata McGraw Hill Ed Pvt. Ltd.
- Joel Grus: *Data Science from Scratch*, O'Reilly.
- Foster Provost & Tom Fawcett: *Data Science for Business*, O'Reilly.
- Roger D. Peng & Elizabeth Matsui: *The Art of Data Science*, Lean Publishing.



W

Heads

Anand

Yadwinder Singh

BCA507T: PYTHON PROGRAMMING

Total Marks: 100
External Examination: 70
Internal Assessment: 30
Credits: 3

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

RATIONALE

The objective of this course is to impart the knowledge of python programming methodologies and their significance. Upon completion of this subject, the student will be able to write non-trivial Python programs dealing with a wide variety of subject matter domains.

LEARNING OUTCOMES

After undergoing the subject, the students will be able to:

- Execute Python code in a variety of environments.
- Use correct Python syntax and control flow construct.
- Use various standard Python modules such as os, sys, math, and time
- Trap various errors via the Python Exception Handling model
- Use the IO model in Python to read and write disk files
- Create their own classes and use existing Python classes.
- Use the Python Regular Expression capabilities for data verification

SECTION A

Introduction to Python: History of Python, Python Versions, Installing Python, Environment Variables, Executing Python from the Command Line, Integrated Development and Learning Environment (IDLE), Editing Python Files, Python Documentation, Dynamic Types, Python Reserved Words, Naming Conventions.

Basic Python Syntax: Basic Syntax, Comments, String Values, String Methods, Python variables, Python operators, Understanding python blocks.

Python program flow control: Conditional blocks using if, else and elif, Simple for loop in python, Use of while loop, Loop manipulation using Pass, Continue and Break.

Collections: Introduction, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections, Implementing loop using range, string, list and dictionaries

SECTION B

Functions: Introduction, Defining Your Own Functions, Parameters, Function Documentation, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of



Handwritten signature

Handwritten signature

Handwritten signature: Amans Yadwinder Singh

BCA506T: DSE: AI for Everyone

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 4

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L: 4 T: 1 P: 0

Course Outcome:

- Define and explain the fundamental concepts and subfields of AI.
- Identify real-world applications of AI across various industries.
- Analyze the ethical, social, and economic implications of AI.
- Recognize the potential of AI to drive innovation and transformation in different domains.

A) 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 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.

B) Instructions for the candidates

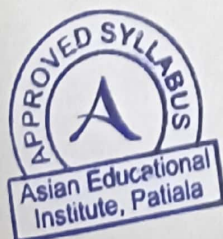
1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory questions of Section C.
2. Use of non-programmable scientific calculators is allowed.

Section -A**Introduction to Artificial Intelligence :**

- Definition and scope of AI
- Historical overview and key milestones
- Differentiating AI from human intelligence

AI Subfields and Technologies

- Machine learning: Supervised, unsupervised, and reinforcement learning
- Deep learning and neural networks
- Natural language processing (NLP) and computer vision

**Section B**

Amans
Heer
Yadwinder k

Applications of AI

- AI in healthcare: Diagnosis, treatment, and medical imaging
- AI in finance: Fraud detection, algorithmic trading, and risk assessment
- AI in transportation: Autonomous vehicles and traffic optimization
- AI in customer service and chatbots
- AI in education: Personalized learning and intelligent tutoring systems

Ethical and Social Implications of AI

- Bias and fairness in AI systems
- Privacy and data protection concerns
- Impact of AI on employment and the workforce
- AI and social inequality

Other Important issues

- Ethical guidelines and responsible AI practices
- AI and Innovation
- Emerging trends and future directions in AI
- AI and creativity: Generative models and artistic applications.



Handwritten signatures and initials:
Vul
Kear to
Amans.
Yadwinder bjl

Arguments, Functions - "First Class Citizens", Passing Functions to a Function, map, filter, Mapping Functions in a Dictionary, Lambda, Inner Functions, Closures

Modules: Modules, Standard Modules – sys, math, time, The dir Function

Data Streams in Python: Read and write: Introduction to Data Streams, Creating Your Own Data Streams, Access Modes, operations in a File

RECOMMENDED BOOKS

1. Learning Python by Mark Lutz; Pratham Books, Bangalore
2. Foundations of Python Network Programming by John Goerzen and Brandeu
3. Rhodes; Apress-eBook distributed by Springer Science and Business Media, NewYork
4. Dive Into Python by Mark Pilgrim; Pratham Books, Bangalore
5. Think Python by Allen B. Downey; O'Reily Media
6. Python Programming For Beginners: A Must Read Introduction to Python
7. Programming by Robert Richards; Pratham Books, Bangalore



Um

Heath

Anans

Yadwinder k/s

BCA508P: SEC LAB: SEC Lab (Python Programming)

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 2

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Practical Sessions: 45-55 Hours

L:0 T:0 P:4

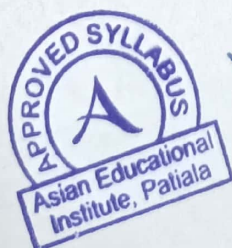
This laboratory course will comprise exercises to supplement what is learnt under paper
BCA508P: SEC LAB: Software Lab-III (Python Programming).

LIST OF PRACTICALS (Python Programming)

1. Getting started with Python and IDLE in interactive and batch modes
2. Use of the string methods: - lower, count and replace
3. Write instructions to perform each of the steps below
 - a. Create a string containing at least five words and store it in a variable.
 - b. Print out the string.
 - c. Convert the string to a list of words using the string split method.
 - d. Sort the list into reverse alphabetical order using some of the list methods(you might need to use dir(list) or help(list) to find appropriate methods).
 - e. Print out the sorted, reversed list of words.
4. Write a program that determines whether the number is prime or not.
5. Find all numbers which are multiple of any number a, but not the multiple of number b, between any given range.
6. Swap two integer numbers using a temporary variable. Repeat the exercise using the code format: a, b = b, a. Verify your results in both the cases.
7. Find the largest of n numbers, using a user defined function largest().
8. Write a function myReverse() which receives a string as an input and returns the reverse of the string.
9. Check if a given string is palindrome or not.

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	Attendance	10% Marks



Handwritten signature

Handwritten signature: Anand, Yachinder

Syllabi Scheme of BCA/BCA Honors (3+1 under NEP 2020)

Session 2026-27 onwards

BCA – III SEMESTER – 6

Sr. No.	Code	Course Type	Title of Paper	L+T	P	External Marks	Internal Marks	Max. Marks	Credits
1.	BCA601T	MAJOR	Power BI	4+0	0	70	30	100	3
2.	BCA602P		Software Lab-VI (Power BI)	-	2	35	15	50	1
3	BCA603T	DSE	Machine Learning (Theory)	3	0	70	30	100	3
4	BCA604P		Software Lab-VI (Machine Learning)	0	2	35	15	50	1
5	BCA605T	DSE	AI Application & Prompt Engineering	4	0	70	30	100	4
6	BCA607T	DSE	Cloud Computing	4	0	70	30	100	4
7	BCA608P	SEC	Major Project	0	4	70	30	100	4
Total Marks						420	180	600	20



✓

Amans
Heard

Yashwinder Singh

BCA III (SEMESTER-VI)**SESSION 2026-27****BCA601T:MAJOR: Power BI**

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 3

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L: 4 T: 0 P: 0

A) 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.

B) 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 Objective:

- 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.

COURSE OUTCOMES: By the end of this course, students should be able to

- Understand the concept and use of Power BI
- Prepare the data from various sources, clean, merge, filter data and model view
- Prepare basic and advanced visualizations
- Calculating columns and DAX and use analytics
- Creating and Publishing interactive report & Dashboards



Getting Started with Power BI : What Is Power BI?, Understanding the Different Components of Power BI, Understanding Power BI as Part of the Power platform, Install Power BI Desktop, Start and Pin Power BI Desktop, Explore the Power BI Workspace Connecting Power BI to Your Data: How Power Query Editor Works, with Power BI Desktop, Connect Power BI Desktop to a Local File, Save, Close, and Open Power BI Reports, Start Working with the Sample Dataset, Connect to a Power BI Dataset

Cleaning and Shaping Data: Remove Duplicate Values, Replace Values in a Column, Split a Column Using a Delimiter, Group data, add a Calculated Column, Add an Index Column Modeling Data in Model View: Create Dimension Tables, Create Relationships between Tables, Create a Star Schema, Create a Hierarchical Schema, Using the Properties Pane

Section B

Creating Basic Visualizations: Create a Bar Chart and line chart, Apply Filters to Visuals, Format the Y-Axis of a Chart, Format the X-Axis of a Chart, Add and Format the Data Category of a Chart, Move a Chart's Legend and Add Gridlines, Add a Zoom Slider and Update

Colors, Add Data Labels to a chart, Add an Image to the Plot Area Background, Create a Pie Chart or Donut Chart, Format a Pie Chart or Donut Chart, Create a Treemap Chart, Format a Tree map Chart.

Creating Interactive Reports: Planning to Create a Report, Start a Report and Add a Title, Add Visuals to a Report, Add Slicers to a Report, Control Which Visuals and Slicers Interact, Enable and Control Drill-Through Actions, Split a Page into Sections, Add Bookmarks and Navigation to a Report

REFERENCES:

1. Alexander Loth- Teach Yourself VISUALLY Power BI- John Wiley & Sons, 2023
ISBN: 978-1-119-90378-9
2. Devin Knight, Erin Ostrowsky Mitchell Pearson, Bradley Schacht Microsoft Power BI Quick Start



Vid

Kishu

*Amang
Tadwinder k/s*

1. Guide, 3 Edition Packt Publishing 2022
4. Dan Clark- Beginning Power BI: A Practical Guide to Self-Service Data Analytics with Excel 2016 and Power BI Desktop Second Edition Apress
5. Orrin Edenfeld, Edward Corcoran- Microsoft Power BI Data Analyst Certification Guide Packt Publishing 2022 ISBN 978-1-80323-856-2



Handwritten signatures

Anand

Yadwinder Singh

BCA602P: MAJOR LAB: Software Lab (Power BI)

Total Marks: 50

University Examination: 35

Internal Assessment: 15

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Practical sessions: 45-55 Hours

***The breakup of marks for the practical will be as under**

i	Internal Assessment	15 Marks
ii	Viva Voce (External Evaluation)	10 Marks
iii	Lab Record, Program Development and Execution (External Evaluation)	25 Marks

This laboratory course will mainly comprise of exercise based on subject BCA602P: MAJOR LAB: Software Lab (Power BI)



Dr. Anand Singh

Yadavinder Singh

BCA603T:MAJOR: Machine Learning

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 3

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Lectures to be delivered: 55-60 Hours

L: 3 T: 0 P: 0

Course Objective:

- Introduce the fundamental problems and applications of machine learning.
- Provide understanding of techniques and mathematical concepts used in machine learning to facilitate further study in this area.
- Provide understanding to evaluate performance of machine learning algorithms.
- Practice software implementation of different concepts and algorithms covered in the course.
- using PYTHON&SCIKIT-LEARN library.

A) 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 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.

B) Instructions for the candidates

1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory questions of Section C.
2. Use of non-programmable scientific calculators is allowed.

SECTION – A

Introduction to Machine Learning: Applications, Challenges, Model Representation,

Basic Introduction to Scikit-Learn.

Supervised Learning: Linear regression (with one variable and multiple variables), Cost Function, Gradient Descent, Polynomial Regression, Decision Trees, Classification (Logistic Regression, Overfitting, Regularization), SVM



W
Accepted
Amant
Yaduvinder 4/5

SECTION – B

Unsupervised Learning: K-means Clustering, Hierarchical clustering

Dimensionality Reduction: Dimensionality reduction using PCA, Dimensionality reduction using LDA, K-fold cross validation

Neural Networks: Multilayer Neural network, Activation Function, Back propagation algorithm, Gradient Checking, Multiclass Classification.

Recommended Books

1. William Mckinney, "Python for Data Analysis: Data wrangling with Pandas, NumPy, and Ipython", 2nd edition, O'Reilly.
2. Aurelien Geron, "Hands-on Machine Learning with Scikit-Learn & TensorFlow", O'Reilly.
3. Raul Garreta, "Learning scikit-learn: Machine Learning in Python", Packt.



Un
Heav
Amans
Yadwinder Singh

BCA604P: DSE : Software Lab -VI(Machine Learning)

Total Marks: 50

University Examination:35

Internal Assessment:15

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Practical sessions: 45-55 Hours

*The breakup of marks for the practical will be as under

i	Internal Assessment	15 Marks
ii	Viva Voce (External Evaluation)	10 Marks
iii	Lab Record, Program Development and Execution (External Evaluation)	25 Marks

This laboratory course will mainly comprise of exercise based on subject BCA604P: DSE : Software Lab -VI(Machine Learning)



Handwritten signatures:
Jal
Anand
Vedwinder Singh

BCA605T: MAJOR: AI Applications and Prompt Engineering

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

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

Course outcome :

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

- Explain the concepts and types of artificial intelligence.
- Illustrate basic machine learning methods for regression, classification and clustering.
- CO3: Identify real-world applications across different disciplines.
- Make use of prompt engineering techniques to interact with generative AI tools. CO5: Outline recent trends in artificial intelligence and machine learning.

A) 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 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.

B) Instructions for the candidates

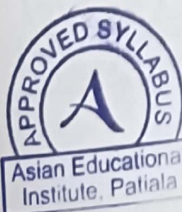
1. Candidates are required to attempt five questions in all, selecting two questions each from Section A and Section B and compulsory questions of Section C.
2. Use of non-programmable scientific calculators is allowed.

Section A

Introduction to Artificial Intelligence: Artificial Intelligence, How Does AI Work?, Advantages and Disadvantages of Artificial Intelligence, History of Artificial Intelligence, Types of Artificial Intelligence, Weak AI, Strong AI.

Applications of AI: Application of AI in Healthcare, Application of AI in Finance, Application of AI in Retail, Application of AI in Agriculture, Application of AI in Education, Application of AI in Transportation, AI in Experimentation and Multi-disciplinary research.

Machine Intelligence: Defining Intelligence, Components of Intelligence, Differences Between Human and Machine Intelligence, Agent and Environment, Search, Uninformed Search Algorithms, Informed Search Algorithms: Pure Heuristic Search, Best-First Search Algorithm



Vid

Arav

Amans, Yashwinder Singh

Cloud Deployment Models: Cloud deployment models, Private Clouds, Public Clouds, Hybrid Clouds, Community, Virtual private Clouds, Heterogeneous and Homogenous Clouds, Selection criteria for Cloud deployment.

Cloud Security: Cloud Security challenges and risks, Principal Characteristics of Cloud Computing Security, Cloud Computing Security Reference Model, How security gets integrated, Principal security Dangers to Cloud Computing, Internal security breaches, Data corruption or loss, User account and service Hijacking, Steps to reduce Cloud Security breaches, Identity and access management.

Text/Reference Books:

- Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, and Cloud Computing: Principles and Paradigms, Wiley.
- Barrie Sosinsky, Cloud Computing Bible, Wiley.
- Michael Miller, Cloud Computing, QUE Publications.
- Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Halper, Cloud Computing for Dummies

W
Aakash
Amans



Yadwinder Singh

(Greedy Search).

Knowledge Representation: Introduction, Knowledge Representation, Knowledge-Based Agent, Types of Knowledge.

Section B

Introduction to Prompt Engineering: Introduction to Prompt Engineering, The Evolution of Prompt Engineering, Types of Prompts, How Does Prompt Engineering Work?, Comprehending Prompt Engineering's Function in Communication, The Advantages of Prompt Engineering, The Future of LLM Communication.

Prompt Engineering Techniques for ChatGPT: Introduction to Prompt Engineering Techniques, Instructions Prompt Technique, Zero, One, and Few Shot Prompting, Self-Consistency Prompt.

Prompts for Creative Thinking: Introduction, Unlocking Imagination and Innovation.

Prompts for Effective Writing: Introduction, Igniting the Writing Process with Prompts.

Textbooks:

1. Reema Thareja, Artificial Intelligence: Beyond Classical AI, Pearson Education, 2023.
2. Ajantha Devi Vairamani and Anand Nayyar, Prompt Engineering: Empowering Communication, 1st Edition, CRC Press, Taylor & Francis Group, 2024. (DOI: <https://doi.org/10.1201/9781032692319>).
3. Saptarsi Goswami, Amit Kumar Das and Amlan Chakrabarti, "AI for Everyone – A Beginner's Handbook for Artificial Intelligence", Pearson, 2024.

Reference books / Manuals:

1. Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (4th Edition), Pearson Education, 2023.
2. Elaine Rich, Kevin Knight, and Shivashankar B. Nair, *Artificial Intelligence*, McGraw Hill Education.
3. Tom Taulli, *Prompt Engineering for Generative AI: ChatGPT, LLMs, and Beyond*, Apress, Springer Nature .Nilakshi Jain, *Artificial Intelligence: Making A System Intelligent*, First Edition, Wiley.



W

Heet

Amans

Yadwinder b/s

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

Maximum Time: 3 Hours
Minimum Pass Marks: 35%
Lectures to be delivered: 55-60 Hours
L: 4 T: 1 P: 0

Course Outcomes:

- Understand the basics of cloud computing, including its definition, characteristics, and service models.
- Understand the differences between public, private, and hybrid clouds, and their use cases.
- Design and implement cloud-based solutions for various industries and applications.
- Understand the security and compliance challenges in cloud computing and how to address them.

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 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 the Candidates

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

SECTION-A

Introduction: Definition of Cloud, Basics of Cloud Computing, Characteristics of Cloud, Benefits of Cloud, Driving factors towards the use of Cloud Computing, Comparing Cloud with Grid Computing Systems, Applications of Cloud Computing.

Basic Concepts and Virtualization: Cloud Computing Evolution, Big Data Concept, Elasticity and Scalability, Virtualization: characteristics of virtualization, Benefits of virtualization, Forms of CPU virtualization, Hypervisors, VMWare, Multitenancy, SLA in Cloud Computing.

Cloud Computing Service Delivery Models: Cloud service delivery models, Cloud Reference Model, Infrastructure as a service (IaaS) architecture, details, examples and applications, Platform as a service (PaaS) architecture, details, examples and applications, Software as service (SaaS) architecture, details, Examples and applications, NIST architecture.

SECTION - B



[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

BCA608P : SEC : MAJOR PROJECT

Total Marks: 100

External Examination: 70

Internal Assessment: 30

Credits: 4

Maximum Time: 3 Hours

Minimum Pass Marks: 35%

Practical Sessions: 45-55 Hours

L:0 T:0 P:4

*The breakup of marks for the practical will be as under

i	Internal Assessment	15 Marks
ii	Viva Voce (External Evaluation)	10 Marks
iii		25 Marks

This laboratory course will mainly comprise of exercise based on subject BCA608P: SEC
LAB: MAJOR PROJECT

W
Hearts
Amans



Yashwinder