BCA Programme in Artificial Intelligence and Machine Learning

Preamble:

In the recent days, we have witnessed the digital technology enabled solutions for many of the products which are useful in our daily life. To provide safe and secure digital solutions, there is an increasing need for intelligent and accurate decision-making systems across industries. This has led to an exponential growth in the adoption of Artificial Intelligence and Machine Learning technologies, and they are expected to remain relevant in the years to come. As industries open up their shores for algorithms to automate their operations, there is an increasing demand for software engineers, and the creative force behind computer programs increased demand for software developers as skilled with artificial intelligence and machine learning.

Machine learning is a specialized field of AI that enables a system to learn from data rather than through explicit programming. This program provides a machine learning-powered content analytics and cognitive search platform that provides students with access to actionable insights from all the data and will help achieve better learning and outcomes.

Program Outcomes: BCA (3 Years) Degree

1. **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.
4. **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.
5. **Application Systems Knowledge:** Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.

6. **Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modelling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
7. **Communication:** Must have a reasonably good communication knowledge both in oral and writing.
8. **Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.
9. **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrity in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
10. **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.
11. **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.

Additional outcomes:

- Utilize concepts of statistics and data analysis along with suitable programming languages to gain insights from vast amounts of data for reliable business intelligence solutions.
- Develop suitable techniques using artificial intelligence algorithms, based on relevant findings within production environments.
- Evaluate appropriate solutions in areas of machine learning, deep learning, and natural language processing to solve real-time problems.

Duration: 3-Years (BCA Degree); 4-Years (BCA-Honours Degree)

Semester	Course Code	Title of the Paper	Credits	Languages, Skill Enhancement Course (SEC), and Ability Enhancement Course (AEC)	Credits	Total Credits
I	BCA-AIML-C1T	Foundations of Mathematics	3	OE1: Open Elective	3	26/ 27
	BCA-AIML-C2T	Fundamentals of Information Technology	3	Language- L1	3	
	BCA-AIML-C3T	Data Structures	3	Language- L2	3	
	BCA-AIML-C4P	C Programming Lab	2	SEC-1: Digital Fluency/ Environmental Studies	2/3	
	BCA-AIML-C5P	Data Structures Lab	2	Physical Education	2(Any 1 Course)	
				Health and Wellness		
II	BCA-AIML-C6T	Computer Architecture	3	OE2: Open Elective	3	27/ 26
	BCA-AIML-C7T	Object Oriented Programming using Java	3	Language- L1	3	
	BCA-AIML-C8T	Database Management Systems	3	Language- L2	3	
	BCA-AIML-C9P	Java Programming Lab	2	Environmental Studies/ SEC-1: Digital Fluency	3/2	
	BCA-AIML-C10P	DBMS Lab	2	Physical Education	2(Any 1 Course)	
				NCC/NSS/CL/R&R		
III	BCA-AIML-C11T	Computer Networks	3	OE3: Open Elective/ India & Indian constitution	3	26
	BCA-AIML-C12T	Operating Systems	3	Language- L1	3	
	BCA-AIML-C13T	Python Programming	3	Language- L2	3	
	BCA-AIML-C14P	Operating Systems Lab	2	SEC-2: Open source Tools/ Financial Education and Investment Awareness	2	
	BCA-AIML-C15P	Python Programming Lab	2	Physical Education	2 (Any 1 Course)	
				NCC/NSS/CL/R&R		
IV	BCA-AIML-C16T	Software Engineering	3	India& Indian Constitution / OE3: Open Elective	3	26
	BCA-AIML-C17T	Artificial Intelligence-1	3	Language- L1	3	
	BCA-AIML-C18T	Internet of Things	3	Language- L2	3	
	BCA-AIML-C19P	AI-1 Lab	2	Financial Education and Investment Awareness/ SEC-2:open source Tools	2	
	BCA-AIML-C20P	IoT Lab	2	Physical Education	2 (Any 1 Course)	
				NCC/NSS/CL/R&R		
V	BCA-AIML-C21T	Artificial Intelligence-2	4	BCA-V1: Vocational Course: Accounting and Financial Management	3	25
	BCA-AIML-C22T	Machine Learning	4	BAC-E1: Elective-1: Web Technologies	3	
	BCA-AIML-C23T	Software verification and Validation	4	SEC-III: Cyber Crime and Cyber Law	3	
	BCA-AIML-C24P	AI-2 Lab	2			
	BCA-AIML-C25P	Machine Learning Lab	2			

VI	BCA-AIML-C26T	Neural Networks	4	BCA-V2: Vocational Course: Digital Marketing	3	24
	BCA-AIML-C27T	Natural Language Processing	4	BAC-E2: Elective-2: Digital Image Processing	3	
	BCA-AIML-C28T	.NET Technologies	4	Professional Communication	2	
	BCA-AIML-C29P	Neural Networks Lab	2			
	BCA-AIML-C30P	.NET Technologies Lab	2			
VII	BCA-AIML-C31T	AI Tools	3	BCA-V3: Vocational Course: Technical Writing	3	22
	BCA-AIML-C32T	Cloud Computing	3	BAC-E2: Elective-2: Animation Technologies	3	
	BCA-AIML-C33T	Deep Learning	3	Research Methodology	3	
	BCA-AIML-C34P	Internship	2			
	BCA-AIML-C35P	Deep Learning Lab	2			
VIII	BCA-AIML-C36T	Principles of Cyber Security	3	BCA-V4: Vocational Course: Project Management	3	20
	BCA-AIML-C37T	Block Chain Technologies	3	BAC-E2: Elective-3: HCI Technologies	3	
	BCA-AIML-C38T	Cyber Security Lab	2	Research Project	6	

Exit Options:

I. After II Semester - Exit option with Certificate in Computer Applications (with a minimum of 52 credits)

II. After IV Semester - Exit option with Diploma in Computer Applications (with a minimum of 104 credits)

III. After VI Semester - Exit Option with Bachelor of Computer Applications Degree (with a minimum of 150 credits)

IV. After VII Semester - Award of Bachelor of Computer Applications Honours Degree (with a minimum of 192 credits)