

**PUNJABI UNIVERSITY REGIONAL CENTRE FOR IT &  
MANAGEMENT, MOHALI**

**Computer Science**

**B.Sc. (AI&DS) Hons.**

**(Course Outcomes)**

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
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<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: General English- I</b>	<b>Course Code: BAIB1101T</b>
<b>Course Outcomes:</b> Upon completion of this course, the students will be able to: <ul style="list-style-type: none"><li>• enable the learner to communicate effectively and appropriately in real life situation;</li><li>• use English effectively for study purpose across the curriculum;</li><li>• develop interest in and appreciation of Literature;</li><li>• develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking, and Writing;</li></ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Punjabi(Compulsory) or ***Punjabi Compulsory(Mudla Gyan)</b>	<b>Course Code: BAIB1102T</b>
<b>Course Outcomes:</b> Upon completion of this course, the students will be able to: <ul style="list-style-type: none"><li>• To develop a bonding with the mother tongue of the student.</li><li>• To know and understand his/her native language in a far better way.</li><li>• To gain knowledge and understanding of the various intricacies of the grammar and literature of Punjabi.</li><li>• To connect the students to their roots.</li><li>• Knowledge of the Punjabi language helps them to think critically while studying Punjabi literature. They are able to relate the pleasure of literature and real life</li></ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Computer Fundamentals</b>	<b>Course Code: BAIB1103T</b>
<p><b>Course Outcomes:</b> Upon completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> <li>• Understanding the concept of input and output devices of Computers</li> <li>• Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.</li> <li>• Understand an operating system and its working, and solve common problems related to operating systems</li> <li>• Learn basic word processing, Spreadsheet and Presentation Graphics Software skills.</li> <li>• Study to use the Internet safely, legally, and responsibly</li> </ul>	

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Problem Solving and Programming in C</b>	<b>Course Code: BAIB1104T</b>
<p><b>Course Outcomes:</b> Upon completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> <li>• Use the fundamentals of C programming in trivial problem solving</li> <li>• Enhance skill on problem solving by constructing algorithms</li> <li>• Identify solution to a problem and apply control structures and user defined functions for solving the problem</li> <li>• Demonstrate the use of Strings and string handling functions</li> <li>• Apply skill of identifying appropriate programming constructs for problem solving</li> </ul>	

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Developing Soft Skills and Personality</b>	<b>Course Code: BAIB1105E</b>
<p><b>Course Outcomes:</b> On completion of the course, student will be able to–</p> <ul style="list-style-type: none"> <li>• Effectively communicate through verbal/oral communication and improve the listening skills</li> <li>• Write precise briefs or reports and technical documents.</li> </ul>	

- Actively participate in group discussion / meetings / interviews and prepare & deliver presentations.
- Become more effective individual through goal/target setting, self-motivation and practicing creative thinking.
- Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Programming Lab – I</b>	<b>Course Code: BAIB1106L</b>
<b>Course Outcomes:</b> After Completion of this course the student will be able to <ul style="list-style-type: none"> <li>• Read, understand and trace the execution of programs written in C language.</li> <li>• Write the C code for a given algorithm.</li> <li>• Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.</li> <li>• Write programs that perform operations using derived data types</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Introduction to Artificial Intelligence and Data Science</b>	<b>Course Code: BAIB1201T</b>
<b>Course Outcomes:</b> At the end of the course, the students will be able to: <ul style="list-style-type: none"> <li>• design a knowledge-based system</li> <li>• familiar with terminology used in this topical area</li> <li>• Read and analyse important historical and current trends addressing artificial intelligence.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Object Oriented Programming Concepts using C++</b>	<b>Course Code: BAIB1202T</b>
<b>Course Outcomes:</b> At the end of the course, the students will be able to: <ul style="list-style-type: none"> <li>• Write, compile and debug programs in C++language.</li> <li>• Use different data types, operators and console I/O function in a computer program.</li> <li>• Design programs involving decision control statements, loop control statements and case control structures.</li> <li>• Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.</li> <li>• Comprehend the concepts of structures and classes: declaration, initialization and implementation.</li> <li>• Apply basics of object oriented programming, polymorphism and inheritance.</li> <li>• Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Data Structures</b>	<b>Course Code: BAIB1203T</b>
<p><b>Course Outcomes:</b> On completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Impart the basic concepts of data structure and algorithms.</li> <li>• Understand the concepts of searching and sorting techniques.</li> <li>• Understood the basic concepts of stacks, queues, linked lists, trees and graphs.</li> <li>• Understand writing algorithms and step by step approach in solving problems with the help of fundamental data structure.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Digital Marketing</b>	<b>Course Code: BAIB1204E</b>
<p><b>Course Outcomes:</b> Students who successfully complete the course will be able to:</p> <ul style="list-style-type: none"> <li>• Examine how marketing, operations, and human resources interact in real-time delivery.</li> <li>• Demonstrate cognitive knowledge of the skills needed to do online research and market research, as well as discover, evaluate, and choose digital market prospects.</li> <li>• Using applicable marketing theories and frameworks, explain emerging trends in digital marketing and critically evaluate the usage of digital marketing tools.</li> <li>• Research and assess difficulties related to adjusting to globalized marketplaces that are continually evolving and becoming increasingly networked.</li> <li>• Examine the traditional marketing mix in light of a growing and diverse set of digital strategies and approaches.</li> <li>• Understand the value of conversion and how to deal with digital relationship marketing</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Programming Lab-II (Based on BSCHAI-122 and BSCHAI-123)</b>	<b>Course Code: BAIB1205L</b>
<p><b>Course Outcomes:</b> On completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Implement the basic concepts of data structure and algorithms.</li> <li>• Implement the concepts of searching and sorting techniques.</li> <li>• Apply the skills to develop concepts about stacks, queues, linked lists, trees and graphs.</li> <li>• Understand writing algorithms and step by step approach in solving problems with the help of fundamental data structure.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Drug Abuse and De-addiction**</b>	<b>Course Code: BAIB1206T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to <ul style="list-style-type: none"> <li>• Describe several addiction models and ideas, as well as other issues associated to substance usage.</li> <li>• Describe the psychological, behavioural, physical, and social consequences of the effects of psychoactive substances on the user and others.</li> <li>• Describe the elements that make it more likely for an individual, community, or organisation to be successful.</li> <li>• Describe contemporary and evidence-based addiction treatment methods.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Mathematical Foundation course</b>	<b>Course Code: BAIB2301T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to <ul style="list-style-type: none"> <li>• apply mathematical logic to solve problems.</li> <li>• Understood sets, relations, functions, and discrete structures.</li> <li>• Use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, and functions.</li> <li>• Frame problems and solve recurrence relations.</li> <li>• Understand the concepts of groups, rings, vector space, etc</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Problem Solving and Programming in Python</b>	<b>Course Code: BAIB2302T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to <ul style="list-style-type: none"> <li>• Simple programming components such as variables, conditional logic, looping, and functions are used to create basic programs.</li> <li>• design object-oriented programs with Python classes. use class inheritance in Python for reusability.</li> <li>• use exception handling in Python applications for error handling.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Web Technology</b>	<b>Course Code: BAIB2303T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to <ul style="list-style-type: none"> <li>• Develop a dynamic webpage by the use of java script and DHTML</li> </ul>	

- write a well-formed / valid XML document.
- Develop a server-side java application
- Create applications by using the concepts like JSP and Servlet

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Theory of Computation</b>	<b>Course Code: BAIB2304E</b>
<b>Course Outcomes:</b> After completing this course, students will be able to:	
<ul style="list-style-type: none"> <li>• Analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars.</li> <li>• Demonstrate their understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving.</li> <li>• Prove the basic results of the Theory of Computation.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Programming Lab-III (Based on BSCHAI-132)</b>	<b>Course Code: BAIB2305L</b>
<b>Course Outcomes:</b> After completing this course, students will be able to:	
<ul style="list-style-type: none"> <li>• The solution of simple to advanced problems using Python language</li> <li>• Develop logic of many programming problems using many data types and control structures of Python.</li> <li>• Implement different data structures.</li> <li>• Implement modules and functions.</li> <li>• Design and implement the concept of object-oriented programming structures.</li> <li>• Use exception handling in Python applications for error handling.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Programming Lab-IV (Based on BSCHAI-133)</b>	<b>Course Code: BAIB2306L</b>

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

- Develop a dynamic webpage by the use of java script and DHTML
- write a well-formed / valid XML document.
- Develop a server-side java application
- Create applications by using the concepts like JSP and Servlet

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Probability and Statistics in Data Science</b>	<b>Course Code: BAIB2401T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to	
<ul style="list-style-type: none"><li>• Describe various statistical formulas.</li><li>• Compute various statistical measures.</li><li>• Understand Binomial Distribution, Poisson Distribution, Normal Distribution</li><li>• Also understand the concept of hypothesis</li></ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Data Analysis using Python</b>	<b>Course Code: BAIB2402T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to	
<ul style="list-style-type: none"><li>• Apply basic data science techniques using Python</li><li>• Understand and apply core concepts like Data Frames and joining data, and use data analysis libraries like pandas, numpy, and matplotlib</li><li>• Analyse data further by applying learned skills in data aggregation and summarization, as well as basic data visualization</li></ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Fundamentals of DBMS</b>	<b>Course Code: BAIB2403T</b>

<p><b>Course Outcomes:</b> On completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>Analyze the Information Systems as socio-technical systems, its need and advantages as compared to traditional file based systems.</li> <li>Comprehend architecture of DBMS, conceptual data modelling, logical database design and physical database design.</li> <li>Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.</li> <li>Apply and create Relational Database Design process with Normalization and De-normalization of data.</li> <li>Demonstrate use of SQL and PL/SQL to implementation database applications with usage of DDL aspect of SQL, DML aspect of SQL, aggregate functions, group by clause, sub query, joins, co-related sub query and indexes, cursor, stored function and procedure, triggers etc.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Software Engineering</b>	<b>Course Code: BAIB2404E</b>
<p><b>Course Outcomes:</b> At the end of the course, the students will have:</p> <ul style="list-style-type: none"> <li>Knowledge of basic SW engineering methods and practices, and their appropriate application;</li> <li>A general understanding of software process models such as the waterfall and evolutionary models.</li> <li>An understanding of the role of project management including planning, scheduling, risk management, etc.</li> <li>An understanding of software requirements and the SRS document.</li> <li>An understanding of different software architectural styles.</li> <li>An understanding of implementation issues such as modularity and coding standards.</li> <li>An understanding of approaches to verification and validation including static analysis, and reviews.</li> <li>An understanding of software testing approaches such as unit testing and integration testing.</li> <li>An understanding of software evolution and related issues such as version management.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Programming Lab-IV (Based on BSCHAI-142)</b>	<b>Course Code: BAIB2405L</b>
<p><b>Course Outcomes:</b> On completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>Apply basic data science techniques using Python</li> <li>Understand and apply core concepts like Data Frames and joining data, and use data analysis libraries like pandas, numpy, and matplotlib</li> <li>Analyse data further by applying learned skills in data aggregation and summarization, as well as basic data visualization</li> </ul>	



<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Software Lab-V(Based on BSCHAI-143)</b>	<b>Course Code: BAIB2406L</b>
<p><b>Course Outcomes:</b> On completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>Analyze the Information Systems as socio-technical systems, its need and advantages as compared to traditional file based systems.</li> <li>Comprehend architecture of DBMS, conceptual data modelling, logical database design and physical database design.</li> <li>Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.</li> <li>Apply and create Relational Database Design process with Normalization and De-normalization of data.</li> <li>Demonstrate use of SQL and PL/SQL to implementation database applications with usage of DDL aspect of SQL, DML aspect of SQL, aggregate functions, group by clause, sub query, joins, co-related sub query and indexes, cursor, stored function and procedure, triggers etc.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: R Programming &amp;Machine Learning</b>	<b>Course Code: BAIB3501T</b>
<p><b>Course Outcomes:</b> On completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>Install, Code, and Use R Programming Language in R Studio IDE and Basic data types: numeric, integer, complex, character, logical; R Strings; R Comments; Conversion of data types; data structures: Vector, List, matrices, Arrays, Data Frames, Factors Describe key terminologies, concepts, and techniques employed in Statistical Analysis.</li> <li>Fundamentals of Machine Learning: Supervised, Unsupervised Machine Learning and relation of statistical modelling to machine learning</li> <li>to use optimization techniques to find the minimum error in your machine learning model</li> <li>to use K-Nearest Neighbors, Support Vector Machines, Linear SVM, Nonlinear SVM, Decision Trees, Naive Bayes classifier.</li> </ul>	

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Data Warehousing and Mining</b>	<b>Course Code: BAIB3502T</b>
<p><b>Course Outcomes:</b> On completion of this course, the students will have Knowledge of</p> <ul style="list-style-type: none"> <li>Data pre-processing and data quality.</li> <li>Modeling and design of data warehouses.</li> <li>Algorithms for data mining Skills</li> <li>to design data warehouses.</li> </ul>	

- Ability to apply acquired knowledge for understanding data and select suitable methods for data analysis.
- Able to Install, Launching Explorer, Loading Data, File Formats, Pre-processing the Data, Classifiers, Clustering.

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Operating Systems</b>	<b>Course Code: BAIB3503T</b>
<b>Course Outcomes:</b> Upon completion of this course, students will have the knowledge: <ul style="list-style-type: none"> <li>• Of the principles of operating systems</li> <li>• the relationship between subsystems of a modern operating system</li> <li>• Evaluate the efficiency aspect of using system resources (processor, memory, disk).</li> <li>• Understand what a process is and how processes are synchronized and scheduled.</li> <li>• Understand different approaches to memory management.</li> <li>• Be able to use system calls for managing processes, memory, and the file system.</li> <li>• Understand the data structures and algorithms used to implement an OS.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Computer Networks</b>	<b>Course Code: BAIB3504T</b>
<b>Course Outcomes:</b> On completion of this course, the students will be able to <ul style="list-style-type: none"> <li>• Understand the concepts of Data Communication.</li> <li>• apply the functions of OSI Layers</li> <li>• Familiarise with the Transmission Media, Flow Control and Error Detection &amp; Correction</li> <li>• Understand the fundamental concepts in Routing, Addressing &amp; working of Transport Protocols.</li> <li>• Gain familiarity with common networking &amp; Application Protocols. 6. Understand Wireless LANs &amp; Wireless Sensor Networks Operation</li> <li>• To use cryptography, substitution ciphers, transposition ciphers, one-time pads, two fundamental cryptographic principles, public-key algorithms (RSA), digital signatures</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Software Lab-VII</b>	<b>Course Code: BAIB3505L</b>
<b>Course Outcomes:</b> At the end of the Course, the Student will be able to: <ul style="list-style-type: none"> <li>• install R Programming Environment.</li> <li>• Utilize and R Data types for Creating programs.</li> <li>• use the different R Data Structures.</li> <li>• Develop logic using R Packages.</li> <li>• Analyze the datasets using R programming capabilities.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Workshop in LINUX</b>	<b>Course Code: BAIB3506L</b>
<p><b>Course Outcomes:</b> At the end of the Course, the Student will be able to:</p> <ul style="list-style-type: none"> <li>• Commands wd, cd, mkdir, cat,more,less,head,tail,ls,date, cal, rmdir, mv,rm,cp</li> <li>• Demonstration of chmod command</li> <li>• list hidden files/directories</li> <li>• skip current (.) and previous directory (..) entries in the output</li> <li>• display files/directories in reverse order</li> <li>• sort ls command output based on file extensions</li> <li>• sort files based on modification time</li> <li>• list subdirectories recursively</li> <li>• list filenames along with their inode numbers</li> <li>• display detailed information about files and directories</li> <li>• display author information</li> <li>• Write a Shell Script to check entered number is negative positive or zero.</li> <li>• Write a Shell Script For Checking Even/Odd numbers Using &amp;&amp; Operator</li> <li>• Write a Shell Script For Removing Duplicate Lines from Files.</li> </ul>	

<b>Program Name: B.Sc.(Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Big Data Analysis and Visualization</b>	<b>Course Code: BAIB3601T</b>
<p><b>Course Outcomes:</b> At the end of the Course, the Student will be able to:</p> <ul style="list-style-type: none"> <li>• Design and create data visualizations.</li> <li>• Conduct exploratory data analysis using visualization.</li> <li>• Craft visual presentations of data for effective communication.</li> <li>• Understand Big Data and its analytics in the real world</li> <li>• Analyze the Big Data framework like Hadoop to efficiently store and process Big Data to generate analytics</li> <li>• Design an Algorithms to solve Data Intensive Problems using Map Reduce</li> <li>• Implementation of Big Data Analytics using pig and spark to solve data intensive problems and to generate analytics</li> <li>• Implement Big Data Activities using Hive</li> </ul>	

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Web Development using PHP and MYSQL</b>	<b>Course Code: BAIB3602T</b>
<p><b>Course Outcomes:</b> At the end of the Course, the Student will have:</p>	

- Understanding of Basics of HTML and PHP like Data Types, Variable, Operators, Decision Making, Functions and Array in PHP , String Handling, Echo function, conditional tag (If Else), Loop,.
- Knowledge to how to create PHP Forms, File Handling, Cookies and sessions, Security features implementation, Validation and Error Handling, file handling, Creating basic newsletter application, captcha Implementation.
- Data Base Concepts using PHP –MySQL

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Cyber Security</b>	<b>Course Code: BAIB3603T</b>
<b>Course Outcomes:</b> At the end of the Course, the Student will have: <ul style="list-style-type: none"> <li>• Understanding of Basic Cyber Security Concepts, Software attacks, Computer Criminals, Cyber Threats-Cyber Warfare,</li> <li>• Knowledge of <b>Cyberspace and the Law</b>, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace,</li> <li>• Understanding of Basic <b>concepts of Cybercrime: Mobile and Wireless Devices</b>, proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era,</li> <li>• <b>Privacy Issues: Basic Data Privacy Concepts:</b> Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains- medical, financial, etc.</li> </ul>	

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Software Lab-IX</b>	<b>Course Code: BAIB3604L</b>
<b>Course Outcomes:</b> At the end of the Course, the Student can: <ul style="list-style-type: none"> <li>• Discuss the challenges and their solutions in Big Data</li> <li>• work on Hadoop Framework and eco systems.</li> <li>• Explain and Analyse the Big Data using Map-reduce programming in Both Hadoop and Spark framework.</li> <li>• analyse and implement different frame work tools by taking sample data sets</li> </ul>	

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Software Lab-X</b>	<b>Course Code: BAIB3605L</b>
<b>Course Outcomes:</b> At the end of the Course, the Student can Practically: <ul style="list-style-type: none"> <li>• Create PHP scripts to handle HTML forms.</li> <li>• Create regular expressions including modifiers, operators, and metacharacters.</li> <li>• Create PHP programs that use various PHP library functions, and that manipulate files and directories.</li> </ul>	

- solve various database tasks using the PHP language and MYSQL.
- solve common Web application tasks by writing PHP program

<b>Program Name: B.Sc. (Hons.) in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>	<b>Program Code: BAIB3PUP</b>
<b>Course Name: Minor Project (2 Weeks In House Industrial Training)</b>	<b>Course Code: BAIB3606P</b>
<b>Course Outcomes:</b> At the end of the Course, the Student will have:	
<ul style="list-style-type: none"> <li>• A fully engaged student shall be able to get exposure to undertake 2 Weeks In House Industrial Training</li> <li>• to make a minor project based on the technologies learnt so far, able to communicate and demonstrate the learning through Project Report and oral Viva voce</li> </ul>	