

Chandigarh Business School of Administration

Vision of Chandigarh Business School of Administration

“To be recognized as the leading business school creating committed professionals determined to serve the society”

Mission of Chandigarh Business School of Administration

M1	To continuously grow and become a fountainhead among the business schools through effective teaching learning processes and pre-placement training.
M2	To strengthen connections with the academia, industry and alumni to facilitate overall development of the students.
M3	To enhance business and technological knowledge of students by providing state-of-the-art facilities.
M4	To provide opportunities to the students for global exposure through international tie-ups.
M5	To develop research, innovation and entrepreneurial culture among students and faculty.
M6	To create ethical and socially responsible professionals for the society.

Department of Computer Applications

Vision of Department of Computer Applications

The Department of Computer Applications endeavors to create the most encouraging environment for quality academics and nurturing students into global IT professionals.

Mission of Department of Computer Applications

M1	To bridge the gap between industry and academia through Training and Placement practices.
M2	To foster a culture of technical excellence among both students and faculty.
M3	The department strives for building quality professionals that are committed and self-motivated with specific skills and to prepare the students for the diverse workplace of the global Environment.
M4	To nurture a community of ethical and socially conscious professionals.
M5	To empower the students through strategic international collaborations and providing global exposure.

B. Sc. (Artificial Intelligence & Machine Learning)

Program Outcomes (POs) – B. Sc. (Artificial Intelligence & Machine Learning)		
1	Basic knowledge	An ability to apply knowledge of basic mathematics, science and domain knowledge to solve the computational problems
2	Discipline knowledge	An ability to apply discipline –specific knowledge to solve core and/or applied computational problem
3	Experiments and practice	An ability to plan and perform experiments and practices and to use the results to solve computational problems.
4	Tools Usage	Apply appropriate technologies and tools with an understanding of limitations.
5	Profession and society practice	Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional
6	Environment and sustainability	Understand the impact of the computational solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
7	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the professional practice.
8	Individual and team work	Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.
9	Communication	An ability to communicate effectively.
10	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

Program Specific Outcomes (BSc. Artificial Intelligence & Machine Learning)		
PSO1	Cognitive Outcome	Proficiency in comprehending, analyzing, and showcasing expertise in human cognition, Python programming, R programming and data analysis to address real-world challenges and effectively tackle future demands.
PSO2	Competency and Innovation Outcome	Demonstrated capability to utilize technical and research proficiencies via participation in various laboratory exercises for designing and creating projects employing contemporary software tools. These efforts aim to offer sustainable solutions to Computer Science, Artificial Intelligence and Machine Learning challenges pertinent to society and the environment.

Program Educational Objectives (B. Sc. Artificial Intelligence & Machine Learning)	
PEO1	Experiment with suitable theories, methodologies, and technologies to apply in the workplace, for further academic pursuits, or to address societal requirements in the specification.
PEO2	Function proficiently within professional settings or sustain employment by engaging in continuous learning endeavors, such as attending professional conferences, pursuing certificate programs, or participating in other educational activities focused on ethics and societal consciousness.
PEO3	Collaborate with others to create, improve, and apply new technologies in the field of computing, specifically in Artificial Intelligence & Machine Learning, by participating in team projects focused on designing, building, and managing systems.
PEO4	Develop computational knowledge and project development skills using innovative tools and techniques to solve problems in the areas related to Deep Learning, Machine learning, Artificial Intelligence.

Course Outcomes – B.Sc.(AI & ML) 1st Semester	
After the completion of the course, students will be able to:	
Mathematics (26C2AIU-101)C: 101	
Course Code	Course Outcomes
C101.1	Classify types of sets and perform set operations
C101.2	Analyze logical statements using propositional logic
C101.3	Identify different types of matrices and perform matrix operations
C101.4	Solve problems related to arithmetic and Geometric progressions
C101.5	Apply sets, logic, matrices and progressions to real world problems.
Fundamentals of Computer and IT (26C2AIU-102)C:102	
Course Code	Course Outcomes
C102.1	Describe the functional units of a computer system including CPU, registers, system bus, and memory components.
C102.2	Explain the concept of computing, types of programming languages, the role of the operating system as a user interface, word processing features, and applications of Information Technology in everyday and professional contexts.
C102.3	Utilize spreadsheet and presentation graphics software to organize data, apply various editing functions, and develop effective slide presentations.
C102.4	Analyze the impact of the Internet on society along with the description of various electronic payment systems, digital signatures, and secure transaction mechanisms used in digital financial services.
C102.5	Elaborate the concepts, features, and real-world applications of mobile computing, cloud computing, big data, the Internet of Things (IoT) etc
Programming in Python (26C2AIU-103)C:103	
Course Code	Course Outcomes
C103.1	Explain the input/output functions and the import command in Python programming.
C103.2	Experiment with decision-making statements, control statements, list indexing, and slicing, for data manipulation.
C103.3	Make use of built-in functions, user-defined functions, importing modules, module path searching, and the use of Python packages & standard library modules.

C103.4	Construct different types of exceptions and built-in exceptions in Python programming.
C103.5	Design Python programs using object-oriented programming concepts such as encapsulation, inheritance, polymorphism, and abstraction
Workshop on Multimedia Tools (26C2AIU-111)C:104	
Course Code	Course Outcomes
C104.1	Explain multimedia concepts, hardware requirements, operating systems, and system architecture
C104.2	Make use of tools and features of GIMP to create and edit graphics.
C104.3	Apply transform and color tools in GIMP for image enhancement.
C104.4	Create animations and optimize images for web using GIMP.
C104.5	Develop a multimedia project using advanced features of GIMP
Programming in Python Laboratory (26C2AIU-113)C:105*	
Course Code	Course Outcomes
C105*.1	Apply Python programming concepts to solve simple computational problems.
C105*.2	Analyze programming problems by interpreting Python data types and control structures to understand their logical flow.
C105*.3	Implement knowledge of data structure to implement them in python programs..
C105*.4	Design modular programming techniques to design and functions & modules in python
C105*.5	Identify object oriented design principles and apply them to implement classes, objects and file handling operations in python.
Fundamental of Computer and IT Laboratory (25C2AIU-112)C:106*	
Course Code	Course Outcomes
C106*.1	Demonstrate the basic features of a word processor and steps to create documents such as resumes, assignments, newsletters, and feedback forms using formatting, tables, images, and mail merge in MS Word.
C106*.2	Explain the use of spreadsheet features to create schedulers, perform calculations using formulas and functions, and demonstrate data analysis using sorting, logical

	operators, and conditional formatting.
C106*.3	Utilize PowerPoint tools and features to develop interactive and well-designed presentations using layouts, multimedia elements, animations, and presentation views.
C106*.4	Analyze the use of internet services such as e-mail, blogging platforms, torrent downloads, and online banking systems for communication and digital financial transactions.
C106*.5	Explore multimedia tools and techniques
English (26C2AIU-104)C:107	
Course Code	Course Outcomes
C107.1	Explain the concepts, types, and modes of communication used in personal, social, and professional contexts.
C107.2	Apply verbal and non-verbal communication techniques in spoken and written forms for effective interaction.
C107.3	Analyze different communication contexts including intra-personal, inter-personal, and group communication to improve message delivery and interpretation.
C107.4	Evaluate and interpret written texts through close reading, summarization, paraphrasing, translation, and comprehension strategies.
C107.5	Develop structured documents such as reports, notes, and letters for academic and professional communication.
English Practical/ Laboratory (26C2AIU-114)C:108*	
Course Code	Course Outcomes
C108*.1	Explain the principles of effective communication and identify causes of miscommunication in everyday and workplace interactions..
C108*.2	Apply listening comprehension skills to interpret conversations, dialogues, and monologues in common communication situations.
C108*.3	Analyze communication strategies used in interviews, group discussions, and role-play activities to improve professional interaction.
C108*.4	Evaluate verbal and non-verbal communication techniques used in workplace communication and formal presentations.

C108*.5	Design and deliver effective public speaking presentations and self-introductions for academic and professional contexts..
Human Values Deaddiction and Traffic Rules (26C2CCU-103)C:109	
Course Code	Course Outcomes
C109.1	Explain the concept of value education, with respect to an individual's understanding of self, ambitions, happiness and prosperity.
C109.2	Interpret the need of self and body to ensure harmony in a human being.
C109.3	Construct a holistic view towards family and society as a whole and the role of human-to-human interaction in it.
C109.4	Analyze harmony in nature and existence.
C109.5	Elaborate the knowledge on ethical human values and its implication on modern day professional requirements.
Human Values, Deaddiction and Traffic Rules (Lab/ Seminar) (25C2HVC-C11)C:110*	
Course Code	Course Outcomes
C110*.1	Estimate the development of Holistic perspective among students towards life, profession and happiness.
C110*.2	Identify the essential complementarily between “VALUES” and “SKILLS” to ensure sustained happiness and prosperity.
C110*.3	Examine the value-based living in a natural way
C110*.4	Formulate plausible implications of such a holistic understanding in terms of Ethical human conduct, trustful and mutually satisfying human behavior.
C110*.5	Outline the responsibilities of a manager for society and organization in the era of globalization at workplace.
Mentoring and Professional Development (25C2CCU-111)C:111**	
Course Code	Course Outcomes
C111**.1	Apply communication skills in today's workplace to facilitate ability to work collaboratively.
C111**.2	Outline the understanding of effective group discussion and interview etiquettes.
C111**.3	Identify the different techniques of communication.
C111**.4	Explain various elements of group dynamics, team building activity and cooperation.
C111**.5	Develop leadership qualities for fostering creativity and collaboration.

Career and Placement Planning (26C2AIU-116)C:110	
Course Code	Course Outcomes
C110.1	Explain the principles of effective communication and identify causes of miscommunication in everyday and workplace interactions..
C110.2	Apply listening comprehension skills to interpret conversations, dialogues, and monologues in common communication situations.
C110.3	Analyze communication strategies used in interviews, group discussions, and role-play activities to improve professional interaction.
C110.4	Evaluate verbal and non-verbal communication techniques used in workplace communication and formal presentations.
C110.5	Design and deliver effective public speaking presentations and self-introductions for academic and professional contexts..

Course Outcome - B.Sc.(AI & ML) 2nd Semester	
After the completion of the course, students will be able to:	
Fundamental of Statistics (26C2AIU-201)C:201	
Course Code	Course Outcomes
C201.1	Demonstrate the use of statistical tools to compute maximum, minimum, averages and range of the data.
C201.2	Represent statistical data in tabular forms (simple table, two way table and higher order tables).
C201.3	Calculate the measures of tendency (mean, median and mode) using grouped and ungrouped data.
C201.4	Analyze the statistical data using appropriate graphical techniques such as histogram, frequency polygon, frequency curve and ogives.
C201.5	Implement spreadsheet techniques to maintain grading sheets and analyze placement data
Operating System (26C2AIU-202)C:202	
Course Code	Course Outcomes
C201.1	Explain the basic concepts of an Operating System, including its functions, role as a resource manager, structure (kernel and shell), different views, evolution, and types of operating systems.
C201.2	Define the concepts of process,scheduling and thread management to illustrate the differences between program and process.
C201.3	Analyze different CPU scheduling algorithms such as FCFS, SJF, Round Robin, and Multilevel Queue based on scheduling criteria and CPU-I/O burst cycles.
C201.4	Differentiate the memory management techniques such as address binding, relocation, paging, segmentation, and virtual memory to determine their role in efficient memory utilization and protection in operating systems.
C201.5	Compare the mechanisms of I/O device management, file management, and advanced operating system types including distributed, multiprocessor, and real-time systems.
Data Structures (26C2AIU-203) C:203	
Course Code	Course Outcomes

C203.1	Explain the basic concepts of static and dynamic memory allocation by the use of algorithms and flowcharts used in real world problem solving.
C203.2	Apply the concept of arrays, pointer, string library functions in program development.
C203.3	Compare different stack and queue implementations based on their operations and applications.
C203.4	Analyze various types of linked lists, Trees, traversal techniques based on their properties and applications.
C203.5	Elaborate various graph representations, sorting algorithms such as Quick Sort, Bubble Sort, Merge Sort, and Selection Sort based on performance parameters.
Data Structures Laboratory (26C2AIU-213)C:204*	
Course Code	Course Outcomes
C204*.1	Apply appropriate programming constructs, coding standards and problem-solving techniques using programming languages such as C/C++/Python/Java.
C204*.2	Develop programs to perform operations on arrays, matrices and strings using user defined functions and recursion.
C204*.3	Make use of searching and sorting algorithms such as linear search, selection sort, insertion sort, quick sort and merge sort.
C204*.4	Design Programs of linear data structures such as stack, queue, circular queue, dequeue and priority queue to solve real world problems.
C204*.5	Identify non-linear data structures and graph traversal techniques including linked lists, binary search trees, Breadth First Search (BFS) and Depth First Search (DFS).
Operating Systems Laboratory (26C2AIU-212)C:205*	
Course Code	Course Outcomes
C205*.1	Demonstrate the process of installations & configuration of the Microsoft Windows and Linux operating systems and describe the concept of dual boot installation of operating systems on a computer system.

C205*.2	Summarize the working principles of FCFS, SJF, and Round-Robin CPU scheduling algorithms and interpret their role in process scheduling within an operating system.
C205*.3	Apply Vi Editor navigation & editing commands to create, edit, save, and manage text files in a Unix/Linux environment.
C205*.4	Analyze the use of shell commands and shell scripting constructs including variables, input/output operations, and data types .
C205*.5	Construct the shell scripts using arithmetic operators and control structures such as if, while, and for to handle decision-making..
Fundamentals of Statistics Laboratory (26C2AIU-211) C:206*	
Course Code	Course Outcomes
C206*.1	Explain the basic concepts of an Operating System, including its functions, role as a resource manager, structure (kernel and shell), different views, evolution, and types of operating systems.
C206*.2	Define the concepts of process,scheduling and thread management to illustrate the differences between program and process.
C206*.3	Analyze different CPU scheduling algorithms such as FCFS, SJF, Round Robin, and Multilevel Queue based on scheduling criteria and CPU–I/O burst cycles.
C206*.4	Differentiate the memory management techniques such as address binding, relocation, paging, segmentation, and virtual memory to determine their role in efficient memory utilization and protection in operating systems.
C206*.5	Compare the mechanisms of I/O device management, file management, and advanced operating system types including distributed, multiprocessor, and real-time systems.
Environmental Science (26C2CCU-203)C:207	
Course Code	Course Outcomes
C207.1	Outline the fundamental aspects of environmental systems and sustainable natural resource management.
C207.2	Identify the concepts of natural sources and sustainable development for environmental conservation.

C207.3	A Analyze the basic phenomenon of structure and function of ecosystem.
C207.4	Categorize the environmental mitigation techniques and disaster management strategies for the environment.
C207.5	Explain the social issues and environmental laws for sustainable development.
Mentoring and Professional Development (25C2CCU-211) C:208**	
Course Code	Course Outcomes
C208**.1	Apply communication skills in today's workplace to facilitate the ability to work collaboratively.
C208**.2	Outline the understanding of effective group discussion and interview etiquettes.
C208**.3	Identify the different techniques of communication.
C208**.4	Explain various elements of group dynamics, team building activity and cooperation.
C208**.5	Develop leadership qualities for fostering creativity and collaboration.
Design Thinking (26C2AIU-214) C:208**	
Course Code	Course Outcomes
C208**.1	Articulate the fundamentals of the Design Thinking Framework for problem-solving.
C208**.2	Examine the needs and challenges of different stakeholders in the given problem domain.
C208**.3	Apply design thinking framework and strategies to develop innovative solutions.
C208**.4	Evaluate the financial viability of the proposed solution (product/service).
C208**.5	Develop teamwork work to validate and test the solution.

Course Outcomes – B.Sc. (AI & ML))3rd Semester	
After the completion of the course, students will be able to:	
Artificial Intelligence (25C2AIU-301)C:301	
Course Code	Course Outcomes
C301.1	Illustrate the fundamental concepts, scope, approaches of Artificial Intelligence.
C301.2	Explore search strategies including forward chaining, backward chaining, blind search (BFS, DFS), heuristic search, A and A* algorithms, AO* algorithm
C301.3	Analyze knowledge representation and reasoning techniques including ontologies, predicate logic, situation calculus, and description logics to represent objects, relations, events, actions, time, and space.
C301.4	Explain the architecture of expert systems and analyze existing expert systems to identify their key components with their relationships between them
C301.5	Simplify intelligent AI solutions by combining machine learning paradigms, neural networks and natural language processing techniques.
Design and Analysis of Algorithms (25C2AIU-302) C:302	
Course Code	Course Outcomes
C302.1	Describe algorithm characteristics and interpret time, space, and recursive complexity
C302.2	Apply brute-force and greedy strategies to solve computational problems like Bin packing and Knapsack
C302.3	Analyze dynamic programming, branch-and-bound, and backtracking techniques for solving optimization problems like TSP.
C302.4	Explain graph algorithms including DFS, BFS, shortest path, minimum spanning tree, topological sorting, and network flow algorithms.
C302.5	Categorise algorithmic complexity classes (P, NP, NP-complete, NP-hard) and apply heuristic and randomized algorithms.
Artificial Intelligence Lab(25C2AIU-311) C:303*	
Course Code	Course Outcomes

C303*.1	Explain and apply basic AI search algorithms to solve classical problem-solving tasks.
C303*.2	Apply depth-first search and best-first search techniques for effective problem solving in AI.
C303*.3	Implement heuristic search techniques such as A* and hill climbing in intelligent systems.
C303*.4	Solve AI problems such as 8-queens, 8-puzzle, and Tower of Hanoi using appropriate search strategies.
C303*.5	Compare the performance of different AI search strategies for problem solving.
Design and Analysis of Algorithms Laboratory(25C2AIU-312) C:304*	
Course Code	Course Outcomes
C304*.1	Experiment with greedy and dynamic programming algorithms for optimization problems.
C304*.2	Apply dynamic programming to solve problems like TSP and matrix chain multiplication.
C304*.3	Practice with DFS and BFS for graph traversal applications
C304*.4	Develop shortest path algorithms such as Dijkstra, Bellman-Ford and Floyd's
C304*.5	Implement minimum spanning tree and heuristic algorithms for real-world problems.
Database Management Systems (25C2AIU-303)C:305	
Course Code	Course Outcomes
C305.1	Compare different data models such as hierarchical, network, relational, and the ER model.
C305.2	Apply relational database concepts including relational algebra and relational calculus for performing database queries.
C305.3	Explain database triggers to automate actions and maintain data integrity in database systems.
C305.4	Evaluate normalization techniques to assess and improve database schema design and justify efficient database structures by analyzing redundancy, dependency, and data integrity.

C305.5	Categorize database recovery techniques, concurrency control, security mechanisms, and the effectiveness of distributed databases in managing and protecting data.
Database Management Systems Lab (25C2AIU-313) C:306*	
Course Code	Course Outcomes
C306*.1	Demonstrate the different types of database queries and explain their execution process in a relational database system.
C306*.2	Apply SQL DDL and DML commands to create database structures and populate, retrieve, and manipulate data in a relational database.
C306*.3	Compute and enforce integrity constraints on a database
C306*.4	Experiment with PL/SQL including stored procedures, stored functions, cursors, packages
C306*.5	Implement the design of new databases and modify existing databases to support new applications.
Internet Tools and Applications (25C2AIU-304) C:307	
Course Code	Course Outcomes
C307.1	Describe the basic concepts, features, and services of the Internet and Protocols.
C307.2	Explain WWW architecture, web browsers, and the functioning of DNS.
C307.3	Analyze the architecture of email along with applications and services of Internet applications.
C307.4	Build web pages using various HTML elements like tables, text formatting, and lists.
C307.5	Make use of URLs, hyperlinks, and images effectively in web page design.

Internet Tools and Applications Laboratory (25C2AIU-314) C:308*	
Course Code	Course Outcomes
C308*.1	Apply basic structure and formatting of HTML web pages.
C308*.2	Demonstrate hyperlinks, URLs and images in web page design.
C308*.3	Develop tables, lists and frames using HTML elements.
C308*.4	Construct the use of CSS to enhance the presentation of web pages.
C308*.5	Experiment with simple web applications such as forms and image maps.

Career and Placement Planning - 1 (25C2AIU-315) C:309**

Course Code	Course Outcomes
C309**.1	Explain the structure of C++ programs, programming fundamentals, data types, operators, and input/output operations.
C309**.2	Apply decision-making and looping constructs to develop basic C++ programs.
C309**.3	Develop modular programs using functions, recursion, and arrays in C++.
C309**.4	Construct object-oriented programs using classes, objects, constructors, and member functions.
C309**.5	Analyze the use of pointers, reference variables, and dynamic memory allocation in C++ programs.

Course Outcomes – B.Sc. (AI & ML))4th Semester	
After the completion of the course, students will be able to:	
Data Science & Machine Learning (25C2AIU-401)C:401	
Course Code	Course Outcomes
C401.1	Interpret fundamental concepts, methods, and theoretical principles in Machine learning.
C401.2	Apply supervised and instance-based learning algorithms to develop solutions for classification and regression tasks.
C401.3	Compare different learning models, algorithms, and implement suitable machine learning techniques.
C401.4	Analyze the functionality of Decision Tree and Bayesian Learning methods and assess their effectiveness in real-world problem solving.
C401.5	Apply the models of Artificial Neural Networks, Genetic Algorithms, and assess their applications in intelligent systems.
Data Science & Machine Learning Lab (25C2AIU-411) C:402*	
Course Code	Course Outcomes
C402*.1	Understand and apply data pre-processing techniques such as cleaning, transformation, and reduction on real-world datasets.
C402*.2	Analyze and visualize data using appropriate graphical tools to extract meaningful insights.
C402*.3	Develop and implement machine learning models for regression and classification problems.
C402*.4	Evaluate and compare different machine learning algorithms using performance metrics.
C402*.5	Demonstrate the ability to use open-source tools and datasets for solving real-world data science problems.
Software Engineering (25C2AIU-402) C:403	
Course Code	Course Outcomes
C403.1	Understand software engineering concepts, process models, and development practices.

C403.2	Apply Agile methodologies and compare them with traditional approaches.
C403.3	Analyze software requirements, risks, and project planning techniques
C403.4	CO4: Design and test software systems using UML diagrams and testing strategies..
C403.5	Evaluate software quality, metrics, and manage maintenance and release processes.
Cloud Computing (25C2AIU-403) C:404	
Course Code	Course Outcomes
C404.1	Define the fundamentals and concepts of Cloud Computing.
C404.2	Explain cloud migration and virtualization technologies.
C404.3	Apply capacity planning and identify cloud resources
C404.4	Analyze SLA management and cloud security.
C404.5	Evaluate different cloud platforms and services.
Cloud Computing Lab(25C2AIU-412)C:405*	
Course Code	Course Outcomes
C405*.1	Define cloud service and deployment models through practical exposure.
C405*.2	Explain cloud migration and virtualization techniques.
C405*.3	Apply cloud resource management and deployment methods.
C405*.4	Analyze cloud security and service management practices.
C405*.5	Evaluate cloud platforms and select suitable cloud solutions.
Advance Python Programming(25C2AIU-404) C:406	
Course Code	Course Outcomes

C406.1	Make use of database connection and execute queries using Python and MySQL.
C406.2	Practice with Pandas library for data manipulation, statistical analysis and data visualization.
C406.3	Apply NumPy library for numerical computation, array manipulation and mathematical operations.
C406.4	Analyze datasets using scientific computing and visualization libraries such as SciPy and Seaborn.
C406.5	Develop basic machine learning models using Python libraries such as Scikit-learn.
Career and Placement Planning - 2 (25C2AIU-414) C:407**	
Course Code	Course Outcomes
C407**.1	Develop Python programs using advanced control structures and functions.
C407**.2	Apply object-oriented programming concepts in Python applications.
C407**.3	Experiment with file handling techniques, exception handling mechanisms, and regular expressions to manage, validate, and process data effectively in programs.
C407**.4	Create the structure and functionality of applications with Python frameworks and development tools.
C407**.5	Demonstrate programs that interact with databases to store, retrieve, and manage data efficiently.

Course Outcomes – B.Sc. (AI & ML))5th Semester	
After the completion of the course, students will be able to:	
R Programming (UGCA1946) C:501	
Course Code	Course Outcomes
C501.1	Identify the key components of R programming Language.
C501.2	Define the concept of data Science.
C501.3	Differentiate between vectors and arrays.
C501.4	Outline the usage of data frames, lists, factors, tables and R structures.
C501.5	Explain the need and utilization of various visualization tools.
R Programming Laboratory (UGCA1952) C:502*	
Course Code	Course Outcomes
C502*.1	Write programs for arrays and matrices.
C502*.2	Execute data frames and lists.
C502*.3	Differentiate between arrays from vectors.
C502*.4	Implement factors in R
C502*.5	Execute minor projects using R.
Natural Language Processing (UGCA1993) C:503	
Course Code	Course Outcomes
C503.1	To explain the concept of natural language processing.
C503.2	To explore the linguistic features relevant to each NLP task.
C503.3	To discuss the phases of Natural language Generation.
C503.4	To apply basic algorithms in this field.
Natural Language Processing Lab (UGCA1994) C:504*	
Course Code	Course Outcomes
C504*.1	Apply preprocessing to text.

C504*.2	Implement different linguistic features and phases of NLP.
C504*.3	Create basic NLP applications.
Deep Learning (UGCA1997) C:505	
Course Code	Course Outcomes
C505.1	Comprehend the advancements in learning techniques
C505.2	Compare and explain various deep learning architectures and algorithms.
C505.3	Demonstrate the applications of Convolution Networks.
C505.4	Apply Recurrent Network for Sequence Modelling
Deep Learning Lab (UGCA1998) C:506*	
Course Code	Course Outcomes
C506*.1	Create basic networks for deep learning.
C506*.2	Implement applications like classification and object detection using CNN.
C506*.3	Implement mining problems using CNN.
Web Mining & Recommender System (UGCA1991) C:507	
Course Code	Course Outcomes
C507.1	To explain techniques to mine the Web and other information networks.
C507.2	To implement mining on Social networks and Social media.
C507.3	To apply the appropriate technique for data analysis.
C507.4	To extract knowledge from web scaled at assets by various techniques .
C507.5	To be familiar with classic and recent developments in Web search and web data .

Course Outcomes – B.Sc. (AI & ML)) 6th Semester

After the completion of the course, students will be able to:

Big Data Analytics (UGCA2006) C:601

Course Code	Course Outcomes
C601.1	Explain the need of Big Data..
C601.2	Discuss the architecture of Big Data.
C601.3	Setup environment for creating Big Data Applications.
C601.4	Implement basic applications of Big Data.

Big Data Analytics Lab (UGCA2007) C:602*

Course Code	Course Outcomes
C602*.1	Installation of Big Data Tools.
C602*.2	Execute various HDFS commands.
C602*.3	Data analytics using Pig.

Intelligent System (UGCA2010) C:603

Course Code	Course Outcomes
C603.1	Explain fundamental principles of intelligent systems.
C603.2	Analyze the relative merits of a variety of AI problem solving techniques.
C603.3	Represent knowledge using structured representations.
C603.4	Implement different evolutionary algorithms in the field of intelligent systems.

Intelligent System Lab (UGCA2011) C:604*

Course Code	Course Outcomes
C604*.1	Implementation of simple artificial neural network.
C604*.2	Implementation of neural network with back propagation.
C604*.3	Implementation of radial basis function network.
C604*.4	Implementation of recurrent neural networks.
C604*.5	Implementation of fuzzy neural networks.
C604*.6	Implementation of iterative deepening search.
Weka- Open Source Software Tool(UGCA2014) C:605	
Course Code	Course Outcomes
C6051	Describe the need of WEKA.
C605.2	Import data in WEKA.
C605.3	Work with different file formats in WEKA.
C605.4	Implement data mining algorithms using WEKA.
Weka- Open Source Software Tool Lab (UGCA2015) C:606*	
Course Code	Course Outcomes
C606*.1	Import data in WEKA.
C606*.2	Work with different file formats in WEKA.
C606*.3	Implement data mining algorithms using WEKA..
Business Intelligence (UGCA2016) C:607	
Course Code	Course Outcomes
C607.1	Describe the need of a business intelligence system.

C607.2	Discuss models of business intelligence.
C607.3	Explain data mining and its classifications.
C607.4	Illustrate various business intelligence applications..
C607.5	Define knowledge management.