Syllabus for BCA
Semester VI

Course Title: Artificial Intelligence and Applications	Course code: 21BCA6C16AIL
Total Contact Hours: 52	Course Credits: 4
Formative Assessment Marks: 40	Duration of SEE/Exam: 02 Hours
Summative Assessment Marks: 60	

Course Outcomes (COs):

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

- CO1. Artificial Intelligence and Applications
- CO2. Become familiar with basic principles and strategies of AI towards problem solving
- CO3. Understand and apply approaches of inference, perception, knowledge representation, and learning.
- CO4. Understand the various applications of AI

DSC 16: Artificial Intelligence and Applications

Unit	Description	Hours
1	**Introduction-** What is Artificial Intelligence, Foundations of AI, History, AI - Past, Present and Future. Intelligent Agents- Environments- Specifying the task environment, Properties of task environments, Agent based programs- Structure of Agents, Types of agents- Simple reflex agents, Model-based reflex agents, Goal-based agents; and Utility-based agents.	10
2	**Problem Solving by Searching-**Problem-Solving Agents, Well-defined problems and solutions, examples Problems, Searching for Solutions, Uninformed Search Strategies-Breadth-first search, Uniform-cost search, Depth-first search, Depth-limited search, Iterative deepening depth-first search, Bidirectional search, Greedy best-first search, A* Search, AO* search Informed (Heuristic) Search Strategies, Heuristic Functions	10
3	**Knowledge Representation**-Knowledge-Based Agents, The Wumpus World , Logic, Propositional Logic, Propositional Theorem Proving, Effective Propositional Model Checking, Agents Based on Propositional Logic, First-Order Logic-Syntax and Semantics of First-Order Logic, Using First-Order Logic, Unification and Lifting Forward Chaining, Backward Chaining	12
4	**Learning–** Forms of Learning, Supervised Learning, Machine Learning - Decision Trees, Regression and Classification with Linear Models, Artificial Neural Networks, Support Vector Machines	10
5	**Applications of AI** - Natural Language Processing, Text Classification and Information Retrieval, Speech Recognition , Image processing and computer vision, Robotics	10

References:

1. Stuart Russel, Peter Norvig: Artificial Intelligence A Modern Approach, 2nd Edition, Pearson Education, 2003

2. Tom Mitchell, “Machine Learning”, 1 st Edition, McGraw-Hill,2017
3. Elaine Rich, Kevin Knight, Shivashankar B Nair: Artificial Intelligence, Tata McGraw Hill 3rd edition, 2013

Course Title: Artificial Intelligence and Applications Lab	Course code: 21BCA6C16AIP
Total Contact Hours: 52	Course Credits: 2
Formative Assessment Marks: 25	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 25	

Practicals:

1) Python program on Problem Solving by Searching: Breadth-first Search.
2) Python program on Problem Solving by Searching: Depth-first Search.
3) Python program on Problem Solving by Searching: Greedy best-first search.
4) Python program on Problem Solving by Searching: A* Search.
5) Python program on Problem Solving by Searching: AO* search Informed (Heuristic) Search Strategies.
6) Python program to demonstrate the supervised machine learning.
7) Python program to predict the price of the car using decision tree.
8) Python program of weather prediction model that predicts whether or not there'll be rain on a particular day.
9) Python program of profit prediction model that states the probable profit that can be generated from the sale of a product.
10) Python program to classify the emails as spam or not spam.
11) Python program that demonstrates how to classify flowers using a Support Vector Machine (SVM) classifier.
12) Python program that demonstrates how to use a basic Artificial Neural Network (ANN) to classify students based on their height and weight.
13) Python program that demonstrates text classification using scikit-learn and a Naive Bayes classifier.
14) Python program using the speech recognition library to perform speech recognition.
15) Python program using the PIL (Pillow) library to illustrate basic image processing operations like opening an image, resizing it, applying a filter, and saving the processed image.

Course Title: PHP & MySQL	**Course code: 21BCA6C17PML**
Total Contact Hours: 52	**Course Credits: 4**
Formative Assessment Marks: 40	**Duration of SEE/Exam: 02 Hours**
Summative Assessment Marks: 60	

Course Outcomes (COs):

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

- CO1. Design dynamic and interactive web pages and websites.
- CO2. Run PHP scripts on the server and retrieve results.
- CO3. Handle databases like MySQL using PHP in websites.

DSC17: PHP & MySQL

Unit	Description	Hours
1	**Introduction to PHP:** Introduction to PHP, History and Features of PHP, Installation & Configuration of PHP, Embedding PHP code in Your Web Pages, Understanding PHP, HTML and White Space, Writing Comments in PHP, Sending Data to the Web Browser, Data types in PHP, Keywords in PHP, Using Variables, Constants in PHP, Expressions in PHP, Operators in PHP.	10
2	**Programming with PHP:** Conditional statements: if, if-else, switch, The? Operator, Looping statements: while Loop, do-while Loop, for Loop **Arrays in PHP:** Introduction- What is Array?, Creating Arrays, Accessing Array elements, Types of Arrays: Indexed v/s Associative arrays, Multidimensional arrays, Creating Array, Accessing Array, Manipulating Arrays, Displaying array, Using Array Functions, Including and Requiring Files- use of Include() and Require(), Implicit and Explicit Casting in PHP.	12
3	**Using Functions , Class- Objects, Forms in PHP:** Functions in PHP, Function definition, Creating and invoking user-defined functions, Formal parameters versus actual parameters, Function and variable scope, Recursion, Library functions, Date and Time Functions **Strings in PHP:** What is String?, Creating and Declaring String, String Functions	10
4	**Class &Objects in PHP:** What is Class & Object, Creating and accessing a Class &Object, Object properties, object methods, Overloading, inheritance, Constructor and Destructor **Form Handling:** Creating HTML Form, Handling HTML Form data in PHP **Database Handling Using PHP with MySQL: Introduction to MySQL: Database terms, Data Types**	10
5	**Accessing MySQL –**Using MySQL Client and Using php MyAdmin, MySQL Commands, Using **PHP with MySQL:** PHP MySQL Functions, Connecting to MySQL and Selecting the Database, Executing Simple Queries, Retrieving Query Results, Counting Returned Records, Updating Records with PHP	10

References:

1. PHP & MySQL for Dynamic Web Sites- Fourth Edition By Larry Ullman.
2. Learning PHP, MySQL and JavaScript By Robin Nixon –O‟REILLY Publications
3. Programming PHP By Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre

4. SAMS Teach Yourself PHP in 24 hours, Author: Matt Zandstra, Sams Publishing

Course Title: PHP & MySQL Lab	**Course code: 21BCA6C17PMP**
Total Contact Hours: 52	**Course Credits: 2**
Formative Assessment Marks: 25	**Duration of SEE/Exam: 03 Hours**
Summative Assessment Marks: 25	

Practicals:

1. Write a PHP script to print “hello world”.
2. Write a PHP script to find odd or even number from given number.
3. Write a PHP script to find maximum of three numbers.
4. Write a PHP script to swap two numbers.
5. Write a PHP script to find the factorial of a number.
6. Write a PHP script to check whether given number is palindrome or not.
7. Write a PHP script to reverse a given number and calculate its sum
8. Write a PHP script to generate a Fibonacci series using Recursive function
9. Write a PHP script to implement atleast seven string functions.
10. Write a PHP program to insert new item in array on any position in PHP.
11. Write a PHP script to implement constructor and destructor
12. Write a PHP script to implement form handling using get method
13. Write a PHP script to implement form handling using post method.
14. Write a PHP script that receive form input by the method post to check the number is prime or not.
15. Write a PHP script that receive string as a form input
16. Write a PHP script to compute addition of two matrices as a form input.
17. Write a PHP script to show the functionality of date and time function.
18. Write a PHP program to upload a file
19. Write a PHP script to implement database creation
20. Write a PHP script to create table
21. Develop a PHP program to design a college admission form using MYSQL database.

Course Title: Fundamentals of Data Science	**Course code: 21BCA6E2FDS**
Total Contact Hours: 42	**Course Credits: 3**
Formative Assessment Marks: 40	**Duration of SEE/Exam: 02 Hours**
Summative Assessment Marks: 60	

Course Outcomes (COs):

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

- CO1. Understand the concepts of data and pre-processing of data.
- CO2. Know simple pattern recognition methods
- CO3. Understand the basic concepts of Clustering and Classification
- CO4. Know the recent trends in Data Science

DSE-E2 (A): Fundamentals of Data Science

Unit	Description	Hours
1	**Data Mining:** Introduction, Data Mining Definitions, Knowledge Discovery in Databases (KDD) Vs Data Mining, DBMS Vs Data Mining, DM techniques, Problems, Issues and Challenges in DM, DM applications.	8
2	**Data Warehouse:** Introduction, Definition, Multidimensional Data Model, Data Cleaning, Data Integration and transformation, Data reduction, Discretization	8
3	**Mining Frequent Patterns:** Basic Concept – Frequent Item Set Mining Methods -Apriori and Frequent Pattern Growth (FP Growth) algorithms - Mining Association Rules	8
4	**Classification:** Basic Concepts, Issues, Algorithms: Decision Tree Induction. Bayes Classification Methods, Rule-Based Classification, Lazy Learners (or Learning from your Neighbours), k Nearest Neighbour. Prediction - Accuracy- Precision and Recall	10
5	**Clustering**: Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering	8

References:

1. Clustering: Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering
2. Arun K Pujari – "Data Mining Techniques" 4th Edition, Universities Press
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Pearson Education, 2012.
4. K.P.Soman, Shyam Diwakar, V.Ajay: Insight into Data Mining – Theory and Practice, PHI
5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar - "Introduction to Data Mining", Pearson Education

Course Title: Mobile Application Development	**Course code: 21BCA6E2MAD**
Total Contact Hours: 42	**Course Credits: 3**
Formative Assessment Marks: 40	**Duration of SEE/Exam: 02 Hours**
Summative Assessment Marks: 60	

Course Outcomes (COs):

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

- CO1. Create Servlets for server side programming Create, test and debug Android application by setting up Android development environment
- CO2. Critique mobile applications on their design pros and cons,
- CO3. Program mobile applications for the Android operating system and understand techniques for designing and developing sophisticated mobile interfaces
- CO4. Deploy applications to the Android marketplace for distribution.

DSE-E2 (B): Mobile Application Development

Unit	Description	Hours
1	**Android OS design and Features:** Android development framework, SDK features, Installing and running applications on Android Studio, Creating AVDs, Types of Android applications, Best practices in Android programming, Android tools, Building your First Android application.	8
2	**Android Application Design Essentials:** Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.	8
3	**Android User Interface Design Essentials:** User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.	8
4	Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.	8
5	**Using Common Android APIs:** Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Deploying Android Application to the World.	10

References:

1. Lauren Darcey and Shane Conder , "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
2. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt. Ltd
3. Mark L Murphy, "Beginning Android", Wiley India Pvt. Ltd
4. Android Application Development All in one for Dummies by Barry Burd, Edition: I
5. Beginning Android 4 Application Development, Wei-Meng Lee, Wiley India (Wrox), 2013
6. Professional Android 4 Application Development, Reto Meier, Wiley India, (Wrox), 2012

Course Title: Web Content Management System	Course code: 21BCA6VWCMS
Total Contact Hours: 52	**Course Credits: 03**
Formative Assessment Marks: 40	**Duration of SEE/Exam: 02 Hours**
Summative Assessment Marks: 60	

Course Outcomes (COs):

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

- CO1. Understand content development basics;
- CO2. Gain Knowledge of tools for multimedia content development for audio/ video, graphics, animations, presentations, screen casting
- CO3. Host websites and develop content for social media platforms such as wiki and blog.
- CO4. Understand e-publications and virtual reality.
- CO5. Use of e-learning platform Moodle and CMS applications Drupal and Joomla.

Voc-2: Web Content Management System

Unit	Description	Hours
1	Web Content Development and Management, Content Types and Formats, Norms and Guidelines of Content Development, Creating Digital Graphics, Audio Production and Editing.	8
2	Web Hosting and Managing Multimedia Content, Creating and Maintaining a Wiki Site. Presentation Software Part I, Presentation Software Part II, Screen casting Tools and Techniques, Multilingual Content Development.	8
3	Planning and Developing Dynamic Web Content Sites, Website Design Using CSS Creating and Maintaining a WIKI Site, Creating and Managing a Blog Site.	8
4	E- Publication Concept, E- Pub Tools, Simulation and Virtual Reality Applications, Creating 2D and 3 D Animations. Introduction to Moodle, Creating a New Course and Uploading.	10
5	Create and Add Assessment, Add and Enroll User and Discussion Forum, Content Management System: Joomla, Content Management System: Drupal.	8

References:

1. Web Content Management: Systems, Features, and Best Practices 1st Edition by Deane Barker.
2. Web Content Management: Systems, Features, and Best Practices 1st Edition by Deane Barker.
3. Moodle for Learning Management System (LMS): A Practical and Visual Guidebook of Administrator and Instructor for Distance Education Paperback – October 12, 2020 by James Koo.
4. Using Joomla!: Efficiently Build and Manage Custom Websites 2nd Edition by Ron Severdia.