MANGALORE UNIVERSITY

National Education Policy – 2020
[NEP-2020]

SYLLABUS
FOR

VI SEMESTER BCA

REVISED CURRICULUM STRUCTURE FOR VI SEMESTER BCA

Semester	Course No	Theory/Practical	Credits	Paper Title	S.A	L.A
VI	DSC16	Theory	4	PHP and MySQL	60	40
	DSC16-Lab	Practical	2	PHP and MySQL Lab	25	25
	DSC17	Theory	4	Advanced JAVA and J2EE	60	40
	DSC17-Lab	Practical	2	Advanced JAVA and J2EE Lab	25	25
	DSC18	Theory	4	Artificial Intelligence and Applications	60	40
	DSE-E2	Theory	3	A. Fundamentals of Data Science B. Mobile Application Development	60	40
	Voc-2	Theory	3	Web Content Management System	60	40
	SEC-5	Theory/Practical	2	Mini Project	30	20

Program Name	**B.C.A**	Semester	**VI**
Course Title	PHP & MySQL		
Course Code:	DSC16	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes: After the successful completion of the course, the student will be able to:

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

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.	**13**
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.	**13**

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 **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:	**13**
4	**Creating HTML Form**, Handling HTML Form data in PHP **Database Handling Using PHP with MySQL**: Introduction to MySQL: Database terms, Data Types.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	**13**

Text Books:

1. PHP & MySQL for Dynamic Web Sites- Fourth Edition By Larry Ullman.

References:

1. Learning PHP, MySQL and JavaScript By Robin Nixon –O"REILLY Publications
2. Programming PHP By Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre
3. SAMS Teach Yourself PHP in 24 hours, Author: Matt Zandstra, Sams Publishing

Pedagogy: Lecture/ PPT/ Videos/ Animations/ Role Plays/ Think-Pair-Share/ Predict-Observe- Explain/ Demonstration/ Concept mapping/ Case Studies examples/ Tutorial/ Activity/ Flipped Classroom/ Jigsaw/ Field based Learning/ Project Based Learning/ Mini Projects/ Hobby Projects/ Forum Theatre/ Dance/ Problem Based Learning/

Game Based Learning/ Group Discussion/ Collaborative Learning/ Experiential Learning / Self Directed Learning etc.

Program Name	**B.C.A**	Semester	**VI**
Course Title	**PHP and MySQL Lab**		
Course Code:	**DSC16-Lab**	No.of Credits	**02**
Contact hours	**4 Hours per week**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution: 4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**B.C.A**	Semester	**VI**
Course Title	**Advanced JAVA and J2EE**		
Course Code:	DSC17	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes: After the successful completion of the course, the student will be able to:

- Identify the need for advanced Java concepts like Enumerations and Collections
- Construct client-server applications using Java socket API
- Make use of JDBC to access database through Java Programs
- Adapt servlets to build server side programs
- Demonstrate the use of JavaBeans to develop component-based Java software

Unit	Description	Hours
1	**Enumerations, Autoboxing and Annotations**(metadata): Enumerations, Enumerationfundamentals, the values() and valueOf() Methods, java enumerations are class types, enumerations Inherits Enum, example, type wrappers, Autoboxing, Autoboxing and Methods, Autoboxing/ Unboxing occurs in Expressions, Autoboxing/Unboxing, Boolean andcharacter values, Autoboxing/Unboxing helps prevent errors, A word of Warning.Annotations, Annotation	**13**

	basics, specifying retention policy, Obtaining Annotations at runtime by use of reflection, Annotated element Interface, Using Default values, MarkerAnnotations, Single Member annotations, Built-In annotations. **Java Beans:** Definition, Advantages of java beans,introspection,bound and constraint properties,persistence,customizers,java beans API,example	
2	**The collections and Framework**: Collections Overview, Recent Changes to Collections,The Collection Interfaces, The Collection Classes, Accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working WithMaps, Comparators, The Collection Algorithms, Why Generic Collections?, The legacyClasses and Interfaces, Parting Thoughts on Collections. **MVC Architecture in Java**: What is MVC architecture in Java, Advantages of MVC Architecture, Implementation of MVC using Java, MVC Architecture Layers,	**13**
3	**String Handling** :The String Constructors, String Length, Special String Operations, StringLiterals, String Concatenation, String Concatenation with Other Data Types, StringConversion and toString( ) Character Extraction, charAt( ), getChars( ), getBytes( )toCharArray(), String Comparison, equals( ) and equalsIgnoreCase( ), regionMatches( )startsWith( ) and endsWith( ), equals( ) Versus == , compareTo( ) Searching Strings,Modifying a String, substring( ), concat( ), replace( ), trim( ), Data Conversion UsingvalueOf( ), Changing the Case of Characters Within a String, Additional String Methods, StringBuffer , StringBuffer Constructors, length( ) and capacity( ), ensureCapacity( ),setLength( ), charAt( ) and setCharAt( ), getChars( ),append( ), insert( ), reverse( ), delete( )and deleteCharAt( ), replace( ), substring( ), Additional StringBuffer Methods,StringBuilder. **RMI Distributed Applications**. How client and server communicatethrough remote objects.Object Persistence and Serialization, Introduction to Distributed Computing, RMI Architecture, Importance of RMI Registry, Developing Simple RMI application, Callback Implementation in RMI.	**13**

4	**Background; The Life Cycle of a Servlet**; Using Tomcat for Servlet Development; A simpleServlet; The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies;Session Tracking. **Java Server Pages** (JSP): JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects **The Concept of JDBC**; JDBC Driver Types; JDBC Packages; A Brief Overview of theJDBC process; Database Connection; Associating the JDBC/ODBC Bridge with theDatabase; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions.	**13**

Text Books:

1. Herbert Schildt: JAVA the Complete Reference, 7th/9th Edition, Tata McGraw Hill, 2007.
2. Jim Keogh: J2EE-TheCompleteReference, McGraw Hill, 2007.

References

1. Y. Daniel Liang: Introduction to JAVA Programming, 7thEdition, Pearson Education, 2007.
2. Stephanie Bodoff et al: The J2EE Tutorial, 2nd Edition, Pearson Education, 2004.
3. Uttam K Roy, Advanced JAVA programming, Oxford University press, 2015.

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Program Name	**B.C.A**	Semester	**VI**
Course Title	**Advanced JAVA and J2EE**		
Course Code:	**DSC17-Lab**	No.of Credits	**02**
Contact hours	**4 Hours per week**	Duration of SEA/Exam	**3 hours**
Formative Assessment Marks	**25**	Summative Assessment Marks	**25**

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:4 Marks Execution:4Marks**	**8 Marks**
Program-2	**PART-B** **Writing:6 Marks Execution:6Marks**	**12 Marks**
Practical Record		**05 Marks**
Total		**25 Marks**

Program Name	**BCA**	Semester	**VI**
Course Title	Artificial Intelligence and Applications		
Course Code:	DSC18	No.of Credits	**04**
Contact hours	**52 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to

- Gain a historical perspective of AI and its foundations.
- Become familiar with basic principles and strategies of AI towards problem solving
- Understand and apply approaches of inference, perception, knowledge representation, and learning.
- Understand the various applications of AI

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.	**13**
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	**13**

	search, Bidirectional search, Greedy best-first search, A* Search, AO* search Informed (Heuristic) Search Strategies, Heuristic Functions	
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.	**13**
4	**Learning**– Forms of Learning, Supervised Learning, Machine Learning - Decision Trees, Regression and Classification with Linear Models, Artificial Neural Networks, Support Vector Machines **Applications of AI** - Natural Language Processing, Text Classification and Information Retrieval, Speech Recognition , Image processing and computer vision, Robotics	**13**

Text Books:

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

References

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

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Program Name	**B.C.A**	Semester	**VI**
Course Title	**Fundamentals of Data Science (Theory)**		
Course Code:	**DSE-E2**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

- Understand the concepts of data and pre-processing of data.
- Know simple pattern recognition methods
- Understand the basic concepts of Clustering and Classification
- Know the recent trends in 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.	**11**
2	**Data Warehouse**: Introduction, Definition, Multidimensional Data Model, Data Cleaning, Data Integration and transformation, Data reduction, Discretization	**11**

3	**Mining Frequent Patterns**: Basic Concept – Frequent Item Set Mining Methods -Apriori and Frequent Pattern Growth (FPGrowth) algorithms -Mining Association Rules	**10**
4	**Classification:** Basic Concepts, Issues, And 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 **Clustering**: Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering	**10**

Text Books:

1. Jiawei Han and Micheline Kambar – "Data Mining Concepts and Techniques" Second Edition
2. Arun K Pujari – "Data Mining Techniques" 4th Edition, Universities Press 3
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar: Introduction to Data Mining, Pearson Education, 2012.
4. 4 K.P.Soman, Shyam Diwakar, V.Ajay: Insight into Data Mining – Theory and Practice, PHI 5
5. Pang-Ning Tan, Michael Steinbach, Vipin Kumar - "Introduction to Data Mining", Pearson Education

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Program Name	**B.C.A**	Semester	**VI**
Course Title	**Mobile Application Development (Theory)**		
Course Code:	**DSE-E2**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

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

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.	**11**

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.	**11**
3	**Android User Interface Design Essentials**: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.	**10**
4	**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**

Text Books:

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

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Program Name	**B.C.A**	Semester	**VI**
Course Title	**Web Content Management System (Theory)**		
Course Code:	**Voc-2**	No.of Credits	**03**
Contact hours	**42 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Outcomes (COs):

After the successful completion of the course, the student will be able to:

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

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,	**11**

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.	**11**
3	Planning and Developing Dynamic Web Content Sites, Website Design Using CSS Creating and Maintaining a WIKI Site, Creating and Managing a Blog Site,	**10**
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, Create and Add Assessment, Add and Enroll User and Discussion Forum, Content Management System: Joomla, Content Management System: Drupal	**10**

Text Books:

1. Web Content Management: Systems, Features, and Best Practices 1st Edition by Deane Barker.
2. Content Management Bible (2nd Edition) 2nd Edition by Bob Boiko.
3. Content Management Bible (2nd Edition) 2nd Edition by Bob Boiko.
4. Using Joomla!: Efficiently Build and Manage Custom Websites 2nd Edition by Ron Severdia

Additional Reading:
https://onlinecourses.swayam2.ac.in/cec20_lb09/preview

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Program Name	**B.C.A**	Semester	**VI**
Course Title	**Mini Project*** **		
Course Code:	**SEC-5**	No.of Credits	**02**
Contact hours	**30 Hours**	Duration of SEA/Exam	**2 hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**30**

*****REFER COMMON GUIDELINES PROVIEDED BY UNIVERSITY TO CONDUCT MINI PROJECT**