

# **CRITERION 1**

## **Curricular Aspects 1.2 - Academic Flexibility**

### **1.2.1**

**Percentage of programm in which Choice Based Credit system (CBCS) has been implemented**

### **INDEX**

<b>Sr. No.</b>	<b>Name of the Document</b>
1	Record of CBCS Courses
2	Minutes of relevant Academic Council/BOS meetings



Esttd. 1962  
NAAC 'A++' Grade

SHIVAJI UNIVERISTY, KOLHAPUR-416 004. MAHARASHTRA  
PHONE : EPABX-2609000 website- [www.unishivaji.ac.in](http://www.unishivaji.ac.in)  
FAX 0091-0231-2691533 & 0091-0231-2692333 – BOS - 2609094  
शिवाजी विद्यापीठ, कोल्हापूर – 416004.

दुरध्वनी (ईपीएबीएक्स) २६०९०००० (अभ्यास मंडळे विभाग- २६०९०९४)  
फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३.e-mail:bos@unishivaji.ac.in

Ref./SU/BOS/Com & Mgmt./ NO 00317

Date : 16/09/2021

To,

The Principal  
All Affiliated (Commerce & Management) Colleges/Institutions,  
Shivaji University, Kolhapur

**Subject : Regarding Syllabi of BCA Part-II (Sem-III/IV) Choice Based Credit System (CBCS) degree programme under the Faculty of Commerce & Management.**

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabi of **BCA Part-II (Sem-III/IV) Choice Based Credit System (CBCS)** under the Faculty of Commerce & Management.

This syllabi shall be implemented from the academic year **2021-2022** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website [www.unishivaji.ac.in](http://www.unishivaji.ac.in) (Student - Online Syllabus).

The question papers on the pre-revised syllabi of above mentioned course will be set for two examination. These chances are available for repeater students, if any.

You are therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully,

  
Dy. Registrar

Encl : As above

Copy to,

1. I/c Dean, Faculty of Commerce & Management
  2. Chairman, Board of Studies
  3. Director, BOEE
  4. Appointment Section
  5. P. G. Admission Section
  6. B.Com and O. E. 1 Section
  7. Affiliation Section (U.G./P.G.)
  8. Computer Center/I.T.
  9. Eligibility Section
  10. Distance Education
  11. P.G. Seminer Section
- } for information
- } for information and necessary action.



Principal  
Gopal Krishna Gokhale College,  
Kolhapur.



# SHIVAJI UNIVERSITY, KOLHAPUR.



Estd. 1962

NAAC "A++" Grade

**Faculty of Commerce and Management**

Syllabus For

**BCA Part II (Sem III & IV) (CBCS)**

(To be implemented from June 2021 onwards)

(Subject to the modifications that will be made from time to time)

Principal  
Gopal Krishna Gokhale College,  
Kolhapur.

BCA-II (Sem.-III)

Course code: CC 301	Web Technology	Credit :04	Marks:100
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Understand basics of website and web development life cycle. 2. Design website using HTML and CSS 3. Implement client side scripting for website development 4. Understand importance and working of HTML5		
UNIT No.	Description	No. of Periods	
I	<b>Introduction - Internet &amp; Website</b> 1.1 Internet-Basics, Internet Protocols(HTTP,FTP,IP) 1.2 World Wide Web(WWW) 1.3 HTTP, DNS, IP Address 1.4 Working of Website 1.5 Web Browser, Web Server, Types 1.6 Types of Websites(Static and Dynamic Websites) 1.7 Web Development lifecycle 1.8 Basics of web hosting	15	
II	<b>HTML and CSS</b> 2.1 Introduction to HTML, History, Features 2.2. HTML tags & attributes 2.3 HTML Form elements 2.4. HTML Frameset 2.5. Limitations of HTML 2.6 Basics of CSS, Syntax 2.7 Types of CSS, Importance of CSS 2.8. CSS Selectors-Group, id, class 2.9. CSS properties- Border, background, list, image, margins 2.10. Advantages and limitations of CSS	15	
III	<b>JAVA Script</b> 3.1 Introduction to JavaScript. 3.2 Difference between client side and server side scripting. 3.3 Identifier & operators 3.4 Control structure 3.5. Dialog boxes 3.6 Functions 3.7 Event Handling 3.8 Objects 3.9 Form Validation	15	
IV	<b>HTML 5</b> 4.1 Introduction to HTML5 4.2. Difference between HTML and HTML5 4.3 HTML5- Attributes, events 4.4 HTML5 canvas 4.5.HTML5 Audio & Video	15	

	4.6 HTML5 Drag & Drop 4.7 Web Forms 2.0	
	<b>Reference Books:</b> 1. Complete HTML-Thomas Powell 2. HTML and JavaScript-Ivan Bayross 3. Javascript:The Complete Reference by ThomasPowell, FritzSchneider 4. Introducing HTML5-BruceLawson,RemySharp 5.HTML BlackBook- Steven Holzner 6.HTML5&CSS3- Castro Elizabeth 7thEdition 7.Web Development and Design Foundations with HTML5- Terry A. Felke-Morris	

BCA-II (Sem III)

Course code: CC 302		Computer Network and Internet	Credit :04	Marks:100
<b>Course Outcomes</b>	After completion of this course student should be able to- <ol style="list-style-type: none"> <li>1. Understand the concept of computer network.</li> <li>2. Identify different components required to build different networks.</li> <li>3. Recognize the functions of network layers and different protocols.</li> <li>4. Discuss the important features of the Internet and Web.</li> </ol>			
UNIT No.	Description			No. of Periods
I	<b>Introduction to Computer Network:</b> Definition of a Computer Network, concept of Network, Components of a computer network, use of computer networks. Simplex, Half duplex & Full duplex. Components of computer networks-files server, workstation. Network devices-hub, repeater, bridge, router, gateway. Classification of computer network- geographical spread (LAN,WAN, MAN).			15
II	<b>Data Transmission &amp; Topologies:</b> Data transmission-serial and parallel transmission. Data communication-analog and digital transmission. Transmission Medias- I) Guided media - twisted pair, coaxial cable, optical fibers. II) Unguided media-radio waves, microwaves, infrared. Topologies- bus, star, ring, mesh, tree.			15
III	<b>TCP/IP and OSI Model:</b> <b>Introduction-</b> Concept of Error detection & control code. Flow control- Stop and Wait protocol, sliding window protocol. Routing & Routing algorithms-shortest path, flooding, distance vector. Switching techniques- circuit, packet & message switching, Connection oriented and connectionless services. <b>TCP/IP Model-</b> Introduction, Working and Functions of – Process/Application layer, Host to Host/Transport layer, Internet layer, Network access/Link layer. <b>OSI Model-</b> Introduction, Working and Functions of – Physical layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer, Application Layer.			15
IV	<b>Internet</b> Introduction to internet. Evolution of Internet, Difference in Internet, Intranet & Extranet. Domain Name System (DNS). Web browsers & its features, Search engines, Netiquette, Introduction to Web 3.0, Advantages of Web 1.0, 2.0 and 3.0. Internet security threats and security solutions.			15
	<b>Reference Books:</b> <ol style="list-style-type: none"> <li>1. Computer Networks Andrew Tanenbaum, Pearson Education</li> <li>2. Computer Networks Fundamentals and applications, R S Rajesh, K S Easwarakumar, R Balasubramanian, VIKAS Publishing House Pvt. Ltd.</li> <li>3. Data Communication and Networks, James Irvin, David Harle Wiley</li> <li>4. Computer Networks protocols, Standards and Interface Black C. Prentice Hall of India</li> <li>5. Computer Communication Networks William Stalling Prentice Hall of India</li> </ol>			

## BCA-II (Sem III)

Course code: CC 303	Data Structure using C	Credit :04	Marks:100
<b>Course Outcomes</b>	After completion of this course student should be able to- <ol style="list-style-type: none"> <li>1. Use and implement appropriate data structure for the required problems using a programming language such as C.</li> <li>2. Understand various searching &amp; sorting techniques</li> <li>3. Implementing various data structures viz. Stacks, Queues</li> <li>4. Implementation of Linked Lists and Trees.</li> </ol>		
UNIT No.	Description	No. of Periods	
I	<b>Introduction to data structures</b> <ul style="list-style-type: none"> <li>• Introduction to Data Structures</li> <li>• Data and Information</li> <li>• Data structures and its types</li> <li>• Data structures operations</li> </ul>	15	
II	<b>Sorting and Searching Methods</b> <ul style="list-style-type: none"> <li>• Introduction to Sorting and searching</li> <li>• Bubble Sort</li> <li>• Insertion sort</li> <li>• Selection sort</li> <li>• Merge sort</li> <li>• Linear search</li> <li>• Binary search and hashing concept</li> </ul>	15	
III	<b>Stacks and Queues</b> <ul style="list-style-type: none"> <li>• Concept of Abstract Data types</li> <li>• Introduction to stack</li> <li>• Primitive Stack operations: Push &amp; Pop</li> <li>• Array and Linked Implementation of Stack in C</li> <li>• Application of stack: Prefix and Postfix</li> <li>• Expressions, Evaluation of postfix expression</li> <li>• Definition of queue.</li> <li>• Operations on queue.</li> <li>• Types of queue-Linear, Circular.</li> <li>• Applications of queue</li> </ul>	15	
IV	<b>Linked Lists and Trees</b> <ul style="list-style-type: none"> <li>• Introduction to linked lists</li> <li>• Implementation of Linked list</li> <li>• Operations on linear linked list, circular linked list, doubly linked list</li> <li>• Sequential and linked lists</li> <li>• Operations such as               <ul style="list-style-type: none"> <li>○ Traversal</li> <li>○ Insertion</li> <li>○ Deletion</li> <li>○ Searching</li> </ul> </li> <li>• Trees : definition, terminologies, representation, types</li> <li>• Tree Traversal- (Preorder, Inorder, Postorder)</li> </ul>	15	
<b>Reference Books:</b>			
1. 1Data Structure Through C- By Dr. Sahani.			

	<ol style="list-style-type: none"><li>2. Data Structures Using C Yashwant Kanitkar – BPB Publication</li><li>3. Introduction to Data Structures using C-Ashok Kamthane</li><li>4. Data Structures using C-Bandopadhyay &amp; Dey(Pearson)</li><li>5. Data Structures using C-By Srivastava BPB Publication.</li><li>6. Data Structure using C by A.M. Tanenbaum, Yecidyanlang</li></ol>	
--	---	--



BCA-II (Sem III)

<b>Course code:</b> <b>AEC304</b>	<b>Elements of Statistics</b>	<b>Credit :04</b>	<b>Marks:100</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- 1) Explain various term used in Statistics. 2) Describe the Measures of Central Tendency and Dispersion 3) Understand Analysis of Bivariate data(Correlation and Regression) 4) Elaborate Sampling Techniques and Time Series Analysis.		
<b>UNIT No.</b>	<b>Description</b>	<b>No. of Periods</b>	
I	<b>Introduction to Statistics</b> 1.1 Meaning and Scope of Statistics, Primary and Secondary data. 1.2 Frequency, Frequency distribution, Qualitative and quantitative data, Discrete and Continuous variables. 1.3 Representation of frequency distribution by graphs: Histogram, Frequency polygon, Frequency curve, O give curve. Representation of Statistical data by Bar diagram and Pie chart. 1.4 Numerical examples based on 1.2, 1.3.	15	
II	<b>Measures of Central Tendency and Dispersion</b> 2.1 Measures of central Tendency (Averages) 2.1.1 Meaning of averages, Requirements of good average. 2.1.2 Definitions of Arithmetic mean (A.M.), Combined mean, Median, Quartiles, Mode, Relation between mean, median and mode. 2.1.3 Merits and Demerits of Mean, Median and Mode. 2.1.4 Numerical examples based on 2.1.2. 2.1.5 Determination of Median and Mode by Graph. 2.2 Measures of Dispersion (Variability): 2.2.1 Meaning of Variability, Absolute and Relative measures of dispersion. 2.2.2 Definitions of Q.D., M.D., S.D. and Variance, Combined variance and their relative measures, Coefficient of Variation (C.V.). 2.2.3 Numerical examples based on 2.2.2.	15	
III	<b>Analysis of Bivariate data:</b> 3.1 Correlation: 3.1.1 Concept of Correlation, Types of correlation (Positive, Negative, Linear and Non-linear), Methods of studying correlation: Scatter diagram, Karl Pearson's Correlation Coefficient (r) and Spearman's Rank Correlation Coefficient (R). 3.1.2 Interpretation of $r = +1$ , $r = -1$ , $r = 0$ . 3.1.3 Numerical examples on 3.1.1 and 3.1.2 3.2 Regression: 3.2.1. Concept of Regression, Definitions of regression coefficients and Equations of regression lines. Properties of regression coefficients (Statements only) 3.2.2 Numerical examples on 3.2.1.	15	

IV	<p><b>Sampling Techniques and Time Series Analysis:</b></p> <p>4.1 Sampling Techniques:</p> <p>4.1.1 Definitions of Sample, Population, Sampling, Sampling Method and Census method. Advantages of sampling method over census method.</p> <p>4.1.2 Types of sampling: Simple Random Sampling (with and without replacement), Stratified Random Sampling, Merits and Demerits of S.R.S. and Stratified Sampling.</p> <p>4.1.3 Simple examples on Stratified Sampling.</p> <p>4.2 Time Series: (Analysis and Forecasting)</p> <p>4.2.1 Meaning and components of Time Series</p> <p>4.2.2 Methods of determination of trend by  (I) Method of Moving Averages.  (II) Method of Progressive Averages. (III) Method of Least Squares (St.Line only)</p> <p>4.2.3 Numerical examples on 4.2.2.</p>	15
	<p>Note: Use of Nonprogrammable calculator is allowed.</p> <p><b>Reference Books:</b></p> <ol style="list-style-type: none"> <li>1) Mathematical Statistics by H.C. Saxena and J. N. Kapur</li> <li>2) Business Statistics by G. V. Kumbhojkar</li> <li>3) Fundamentals of Statistics by S. C. Gupta</li> <li>4) Business Statistics by S. S. Desai</li> <li>5) Business Statistics - SIM-Shivaji University, Kolhapur</li> </ol>	

**BCA-II (Sem.-III)**

<b>Course code:</b> AEC305	<b>Human Resource Management and Materials Management</b>	<b>Credit :04</b>	<b>Marks:100</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Understand Human Resource Planning Process. 2. Elaborate Performance Appraisal, Training and Development, Wage and salary Administration. 3. Explain functions of material management 4. Demonstrate 5 R in purchasing and Inventory control techniques.		
<b>UNIT No.</b>	<b>Description</b>	<b>No. of Periods</b>	
I	<b>Human Resource Management:</b> Definitions, Objectives, Functions, Scope and Activities of HRM, <b>Human Resources Planning:</b> Definition and objectives of Human Resource planning, HRP process, Concept of Recruitment and Selection -Recruitment policy-Sources of Recruitment-Selection procedure – Promotion and demotion policy- Transfer policy.	15	
II	<b>Performance Appraisal, Training and Development, Wage and salary Administration</b> Performance Appraisal Concept and objectives of performance Appraisal-Process of Performance Appraisal and methods Training and Development: Meaning and Definition- Need-Objectives-Importance of Training-Training Methods-Evaluation of Training Programme. Wage and Salary Administration Methods of wage payments-Employee Remuneration factors determining the level of remuneration- Profit sharing-Fringe Benefits and welfare incentives. Wages& Salary Administration	15	
III	<b>Introduction to Material Management:</b> Definition, Objectives, Importance of Material Management. Functions of Material Management, Integrated approach to Material Management, Challenges in Material Management, Future of Material Management in India and Role of Computer in Material Management.	15	
IV	<b>Purchasing &amp; Inventory Management-</b> Purchasing-Definition, Objectives, Purchasing as a profit centre, 5R in purchasing, Purchasing cycle. Inventory Management-Definition, types of inventory, inventory costs, need of inventory.EOQ, Basic EOQ model. Vendor Managed Inventory, Selective Inventory control techniques.	15	
	<b>Note:</b> Students should study your own institute/college from the perspectives of first two units. Students should study the different heads of salary sheet from office of institute/college/any business organisation. The details of every heads should be learnt i.e. PF, ESI, Income Tax, DA, HRA and the like.		
	<b>Reference Books:</b> 1) Personnel Management by Edwin Flippo. 2) Personnel & Human Resource Management - Text &Case by P.Subba		

	Rao. 3) Human Resource Management by Garry Desslar, Pearson Education Asia. 4) Purchasing and Materials Management by P. Gopalakrishnan 5) Materials Management-An Integrated Approach-Prentice Hall India, New Delhi-P.Gopalkrishnan & M.Sudarshan 6) Materials Management-Procedure, Text & Case-Prentice Hall India-A.K Dutta 7) Materials and Logistics Management-Everest Publication-L.C Jhamb	
--	---	--

## BCA-II (Sem.-III)

Course code: CCL 306	Lab Course-V Based on CC301	Credit :02	Marks: 50
<b>Course Outcomes</b>	After completion of this course student should be able to- 1: Understand Web Design Concept 2: Design Web Pages using CSS, HTML & Java Script		
<b>Sr. No.</b>	<b>List of Practical's</b>		
1.	Design web page using heading and formatting tags in HTML		
2.	Design web page using tags-marquee, Image tags, hyperlink, list		
3.	Create Railway timetable using Table tag		
4.	Create HTML form for students registration		
5.	Create your class timetable using table tag.		
6.	Design a web page of your home town with an attractive background color, text color, an Image, font etc. (use internal CSS).		
7.	Use Inline CSS to format your resume that you created.		
8.	Use External CSS to format your class timetable as you created.		
9.	Use External, Internal, and Inline CSS to format college web page that you created.		
10.	Design a web page of your home town with an attractive background color, text color, an Image, font etc. (use internal CSS).		
11.	Demonstrate dialogue boxes in java script		
12.	Write a program in java script to perform arithmetic operations.		
13.	Write a java script function that reverse a number.		
14.	Demonstrate Objects in Javascript.		
15.	Write a javascript function to check the number prime or not .		
16.	Changing the background color of a web page using javascript DOM.		
17.	Validating html form elements using javascript.		
18.	Write a program in javascript to print the fibonacci series.		
10.	Demonstrate events in Javascript		
20.	Design web page using HTML5 Tags		

BCA-II (Sem.-III)

<b>Course Code: CCL307</b>	<b>Lab Course VI based on CC303 and AEC304</b>	<b>Credit :02</b>	<b>Marks:50</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Implement various data structures viz. Stacks, Queues, Linked Lists and Trees 2. Apply Ms Excel features for Data Manipulation and Analysis.		
<b>Sr.No.</b>	<b>Practical's on CC303</b>		
1	Write a program to implement stack using static method.		
2	Programs to implement applications of stack.		
3	Write a program to implement Queue using static method.		
4	Programs to implement applications of queue.		
5	Write a program to create linked list, add node to linked list and Remove node from linked list.		
6	Write a program to implement types of linked list.		
7	Write a program to implement stack and queue dynamically.		
8	Write a program to sort given elements using bubble sort, insertion sort, selection sort		
9	Write a program to search given element using Linear Search.		
10	Write a program to search given element using Binary Search.		
	<b>Practical's on AEC304</b>		
	Ten Lab assignments based on AEC 304 using following Excel features: <ul style="list-style-type: none"> <li>• Create workbook</li> <li>• Excel Charts</li> <li>• Apply Custom Data Formats</li> <li>• Use Advanced Fill Options</li> <li>• Apply Advanced Conditional Formatting and Filtering</li> <li>• Apply Custom Styles and Templates</li> <li>• Use Custom Views</li> <li>• Functions</li> <li>• Apply functions in formulas</li> <li>• Mathematical Functions</li> <li>• Financial functions</li> <li>• Useful Data Functions</li> <li>• Some Other Useful Functions</li> <li>• Look up data by using functions</li> <li>• Apply advanced date and time functions</li> <li>• Functions for Manipulating Text</li> <li>• Pivot tables</li> </ul>		

**BCA II (Sem. IV)**

<b>Course Code: CC 401</b>	<b>RDBMS</b>	<b>Credits:04</b>	<b>Marks: 100</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- <ol style="list-style-type: none"> <li>1. Describe the fundamental elements of Relational Database Management Systems.</li> <li>2. Explain various commands in data languages with example.</li> <li>3. Understand various subqueries &amp; joins.</li> <li>4. Apply the control statements and stored procedures.</li> </ol>		
<b>Unit No.</b>	<b>Descriptions</b>	<b>No. of Periods</b>	
<b>I</b>	<b>Introduction to RDBMS</b> <ul style="list-style-type: none"> <li>• Concept of RDBMS</li> <li>• Difference between DBMS and RDBMS</li> <li>• Terminologies: relation, attribute, domain, tuple, entities</li> <li>• Entity relationship model</li> <li>• Relational Model: Structure of Relational Database</li> <li>• Concept of RelationalAlgebra</li> <li>• Role and Responsibilities of DBA</li> <li>• <b>Database Protection:</b> Security Issues, Threats to Databases, Security Mechanisms</li> </ul>	<b>15</b>	
<b>II</b>	<b>Basics of MySQL</b> <ul style="list-style-type: none"> <li>• Difference between SQL and MySQL</li> <li>• Creating a Database and Tables</li> <li>• DDL,DML,DCL,TCL Commands</li> <li>• Clauses- Order by, where and group by</li> <li>• Functions in MySQL                             <ul style="list-style-type: none"> <li>○ Aggregate functions(avg, count, min, max, sum)</li> <li>○ String Functions(concat, instr,mid, length, strcmp, trim, ltrim, rtrim)</li> <li>○ Math Functions(abs, ceil, floor, mod,pow, sqrt)</li> <li>○ Date and Time Functions( adddate, datediff, day, month, year, hour, min, sec)</li> </ul> </li> </ul>	<b>15</b>	
<b>III</b>	<b>Subqueries and Joins in MySQL</b> <ul style="list-style-type: none"> <li>• Subqueries                             <ul style="list-style-type: none"> <li>➤ Concepts of Sub queries</li> <li>➤ sub queries with IN, EXISTS,NOT EXISTS</li> <li>➤ subqueries restrictions</li> <li>➤ Nested subqueries</li> <li>➤ ANY/ALL clause</li> <li>➤ correlated sub queries</li> <li>➤ Group by and Having clause</li> </ul> </li> <li>• Concepts of Join</li> <li>• Types of Join                             <ul style="list-style-type: none"> <li>➤ Inner Join</li> </ul> </li> </ul>	<b>15</b>	

	<ul style="list-style-type: none"> <li>➤ Outer Join</li> <li>➤ Left Join</li> <li>➤ Right Join</li> <li>➤ Cross Join</li> </ul> <ul style="list-style-type: none"> <li>• <b>Views</b> (creating, altering dropping, renaming and manipulating views)</li> </ul>	
<b>IV</b>	<p><b>MySQL control statements and stored procedures</b></p> <ul style="list-style-type: none"> <li>• Control Statements- If, case and loop</li> <li>• Stored procedures – Creating and executing procedures with and without parameters</li> <li>• Cursors- Declare, open, fetch, close</li> <li>• Triggers- Create, show and drop trigger, Types of trigger</li> </ul>	<b>15</b>
	<p><b>Books Recommended:</b></p> <ol style="list-style-type: none"> <li>1. Introduction to Database Systems C. J. Date Pearsons Education</li> <li>2. Database System Concept Korth, Silberschatz and Sudarshan MGH</li> <li>3. Fundamentals of Database Systems Elmasri Navathe Pearson Education</li> <li>4. SQL /PL SQL For Oracle 11G BlackBook Dr.Deshpande Wiley Dreamtech</li> <li>5. ORACLE PL/SQL Programming Scott Ulman TMH 9th</li> <li>6. SQL, PL/SQL the programming language of Oracle Ivan Bayross BPB 4<sup>th</sup> Edition</li> </ol>	



**BCA-II (Sem IV)**

<b>Course code:</b> CC 402	<b>Software Engineering</b>	<b>Credit :04</b>	<b>Marks:100</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- <ol style="list-style-type: none"> <li>1. Understand life cycle models, requirement elicitation techniques, understand the concept of analysis and design of software.</li> <li>2. Develop SRS document.</li> <li>3. Use of analysis and design tools for system development.</li> <li>4. Apply software engineering concepts in software development to develop quality software.</li> </ol>		
<b>UNIT No.</b>	<b>Description</b>	<b>No. of Periods</b>	
I	<b>Introduction to Software Engineering:</b> Introduction to system, Characteristics of system, types of system, Program vs Software, Definition of Software Engineering, importance, principles of software engineering, Difference between software engineering and software programming, Members involved in software development. SDLC (General software development life cycle with all phases) <b>Software process models:</b> Overview of software models (Waterfall, Prototyping and Spiral model).	15	
II	<b>Requirement Engineering:</b> What is Requirement Engineering, Types of requirements, Requirement elicitation techniques- Traditional methods and Modern methods, Verification and validation process, Formal technical review, Principles of Requirement Specification, Software Requirement Specification document, Characteristics of good SRS.	15	
III	<b>Analysis and System Design tools:</b> Data Flow Diagrams (DFD), Data Dictionary, Entity-Relationship Diagrams, Decision Tree and Decision Table. Input and Output Design- I/O design considerations, Structured Chart, HIPO chart, Characteristics of Good Design, <b>CASE STUDIES</b> – Library Management System, Inventory Management System.	15	
IV	<b>Software Testing and Software Quality Assurance</b> <b>Software Testing:</b> Definition, Test characteristics, Types of testing: Black-Box Testing , White-Box Testing ,Unit testing , Integration testing, Validation testing, System testing. <b>Software Quality Assurance:</b> <b>Introduction-</b> Quality, and its attributes, quality control, quality assurance, cost of quality, SQA activities, SQA plan.	15	

	<p><b>References (Books, Websites etc):</b></p> <ol style="list-style-type: none"><li>1. Software Engineering a Practitioners Approach by S. Pressman &amp; Roger, Seventh Edition, McGraw Hill International Edition.</li><li>2. Software Engineering by Sommerville, , 7th edition, Pearson Publication</li><li>3. Software Engineering by K.K. Aggarwal &amp; Yogesh Singh, New Age International Publishers.</li><li>4. Web sites of NPTEL / Swayam</li><li>5. <a href="http://www.edx.com">www. edx.com</a></li></ol>	
--	--	--

BCA-II (Sem IV)

Course code: CC 403		DOT NET Technology	Credit :04	Marks:100
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Understand features of C# DOT NET 2. Implement various server controls for website development 3. Apply validation and state management for interactive website development 4. Design and develop dynamic web application using ADO.Net			
UNIT No.	Description	No. of Periods		
I	<b>Introduction to .NET Framework</b> 1.1. Overview of .NET 1.2. Features of .NET 1.3. Managed and unmanaged code 1.4. Meta Data 1.5. .NET types and .NET object and name spaces 1.6. Architecture of DOT NET Framework: CLR, CTS, MSIL, JIT, CLS, FCL 1.7. Types of JIT 1.8 Visual studio .NET IDE	15		
II	<b>C# Basics</b> 2.1 Introduction to C# 2.2 Entry point method, command line arguments 2.3 Different valid forms of main() 2.4. Difference between .Exe and .DLL 2.5 Parameter Passing mechanism, Out parameter 2.6 Data types 2.7 Type Casting, Boxing & Unboxing 2.8 Partial class and implementation 2.9 Control structures	15		
III	<b>ASP .NET</b> 3.1. Asp.Net Server controls 3.2. Web form lifecycle 3.3. Validation controls 3.4. Navigation controls 3.5 Response.redirect, server.response, 3.6 Cross page posting 3.7 State Management	15		
IV	<b>ADO.NET</b> 4.1 Data Controls in ASP.Net 4.2 ADO.Net Classes-Connection, Command, DataReader, DataAdapter, Dataset 4.3 Connected and Disconnected architecture 4.4 Data binding using ADO.net 4.5 Report generation, simple and parameterized reports	15		
	<b>Books Recommended:</b> 1. ASP .NET-The Complete Reference Tata MacGraw Hill 2. ASP.NET 4 Unleashed by Stephen Walther, Kevin Scott Hoffman, Sams Publishing			

	<ol style="list-style-type: none"><li>3. Bill Evjen, Professional ASP.NET 3.5 in C# and VB, Wrox Publication</li><li>4. Kogent Solutions, C# 2008 Programming covers. NET 3.5 (Black Book), Dreamtech Press</li><li>5. Microsoft ASP.NET 4.0 Step by Step - George Shepherd, Microsoft Press</li><li>6. Mastering ASP.Net - BPB Publication</li><li>7. ASP.net – The Complete Reference- Tata McGraw Hill</li><li>8. ASP.NET Programming – Murach</li><li>9. ASP.NET 4.0 Programming- Joydip Kanjilal</li></ol>	
--	---	--

BCA II (Sem IV)

<b>Course code:</b> <b>AEC 404</b>	<b>Entrepreneurship Development</b>	<b>Credit :04</b>	<b>Marks:100</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Define characteristics, function and types of entrepreneurs and know the role of Entrepreneurship in Economic Development. 2. Identify Business Opportunities and prepare business plan. 3. Know project finance agencies. 4. Understand New Opportunities and Challenges in digital entrepreneurship.		
<b>UNIT No.</b>	<b>Description</b>	<b>No. of Periods</b>	
I	<b>Introduction to Entrepreneurship :</b> Evolution, Concept and definition of an entrepreneur, Characteristics, function and types of entrepreneurs, Qualities of an Entrepreneur, Growth of Entrepreneurship in India, Role of Entrepreneurship in Economic Development, Women Entrepreneurship in India.	15	
II	<b>Business Opportunity Identification:</b> Search for Business Ideas, Market Assessment, Sources of Information and Environmental Analysis, Entrepreneurial opportunities in India, Business Opportunity identification and selection.	15	
III	<b>Business Plan Preparation and Project Finance</b> Meaning of Business plan, Significance and Contents of a Business Plan, developing Business Plan, Presenting Business Plan and Preparation of project report. Project Finance: Introduction, Types of Finance, Sources of Finance, Venture Capital, Start-up and Make-in-India program, MUDRA. Support Agencies: Support to Entrepreneurs by DIC, SIDBI, SIDCO, SSIB, NSIC, SISI, Other Institutions etc. Entrepreneurship promotion by Government through various schemes.	15	
IV	<b>Digital Entrepreneurship:</b> Meaning and Introduction, New Opportunities and Challenges, Choosing a Digital Business Idea, Creating a Digital Business Design. Digital Business Model. Digital business platforms. Different Electronic interface to consumers. Components of business website. IT Entrepreneurs: Azim Premji, N.R. Narayan Murthy and Shiv Nadar	15	
	<b>References Books:</b> 1. Dr. Dilip Sarwate, Entrepreneurship Development and Project Management, Everest Publishing house 2. Vasant Desai, Dynamics of Entrepreneurship development and Management, Himalaya Publishing House 3. David H Holt, Entrepreneurship and New Venture Creation, Prentice Hall 4. Paul Ajit Kumar, Paul, Entrepreneurship Development, Himalaya Publishing House Mumbai 5. Raj Shankar – Entrepreneurship: Theory and Practice – Vijay Nicole Imprints Pvt. Ltd. 6. S.S. Khanka – Entrepreneurial Development – S. Chand And		

Company Ltd., New Delhi 7. Onathan P Allen- Digital Entrepreneurship, Routledge-CRC press <b>Websites :</b> www.startupindia.gov.in www.india.gov.in http://www.makeinindia.com/home	
---	--

BCA-II (Sem IV)

<b>Course Code: CCL 405</b>	<b>PHP</b>	<b>Credits: 02</b>	<b>Marks: 50</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Understand the environment of PHP programming Language. 2. Develop web applications using PHP.		
<b>Unit No.</b>	<b>Description</b>	<b>No. of Periods</b>	
I	<b>Introduction:</b> PHP introduction, Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), Operators: Arithmetic, Assignment, Relational, Logical, Bitwise, ternary and MOD operator. <b>Control Structures:</b> PHP if else conditional statements (nested if and else), switch case, while, for and do while loop, goto, break, continue and exit.	15	
II	<b>String and Regular Expression:</b> Creating and accessing String , Searching & Replacing String , Formatting, joining and splitting String ,String Related Library functions. <b>Arrays:</b> Anatomy of an Array, Creating index based and Associative array, Accessing array, Looping with Index based array, with associative array using each() and foreach(). <b>Functions:</b> Need of Function, Scope of Function Global and Local, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, <b>Working with Forms:</b> Processing Form Input, Validating Form Input: Required Fields, Numbers, Email Addresses, Drop-Down Menus, Radio Buttons, Checkboxes, Dates and Times.	15	
	<b>List of Practical's</b> 1. Write a PHP program to swap two numbers with and without using third variable. 2. Write a PHP program to find the factorial of a number. 3. Write a PHP program to count the total number of words in a string. 4. Write a program in PHP to find the occurrence of a word in a string. 5. Write a PHP program to demonstrate various functions of regular expression. 6. Write a PHP program to find area of triangle and rectangle using functions.		

	<ol style="list-style-type: none"><li>7. Write a PHP program to find the GCD of two numbers using user-defined functions.</li><li>8. Write a Program for demonstrating sorting functions.</li><li>9. Write a Program using arrays.</li><li>10. Design a simple web page using PHP.</li></ol>	
<p><b>Books Recommended:</b></p> <ol style="list-style-type: none"><li>1. PHP &amp; MySQL for Dummies by Janet Valade</li><li>2. PHP and MySQL Web Development by Luke Welling, Laura Thompson</li><li>3. Programming PHP by RasmusLerdorf, Kevin Tatroe</li><li>4. PHP Cookbook by David Sklar&amp; Adam Trachtenberg</li></ol>		

BCA II (Sem.- IV)

Course Code: CCL 406	Lab Course VII Based CC 401	Credits:02	Marks: 50
<b>Course Outcomes</b>	After completion of this course student should be able to- <ol style="list-style-type: none"> <li>1. Design database for business applications.</li> <li>2. Use of queries, sub queries, join, view and stored procedures on databases.</li> </ol>		
<b>Sr.No.</b>	<b>List of Practical's:</b>		
<b>1</b>	Create the tables with appropriate constraints.		
<b>2</b>	Perform the following: <ul style="list-style-type: none"> <li>➤ Viewing all existing databases</li> <li>➤ Creating a Database</li> <li>➤ Viewing all Tables in a Database</li> <li>➤ Creating Tables (With and Without Constraints)</li> <li>➤ Inserting/Updating/Deleting Records in a Table</li> <li>➤ Saving (Commit) and Undoing (rollback)</li> </ul>		
<b>3</b>	Perform the following: <ul style="list-style-type: none"> <li>➤ Altering a Table</li> <li>➤ Dropping/Truncating/Renaming Tables</li> <li>➤ Granting and revoking permissions</li> </ul>		
<b>4</b>	Perform the following: <ul style="list-style-type: none"> <li>➤ Simple Queries</li> <li>➤ Simple Queries with Aggregate functions</li> <li>➤ Queries with Aggregate functions (group by and having clause)</li> </ul>		
<b>5</b>	Queries involving <ul style="list-style-type: none"> <li>➤ Date Functions</li> <li>➤ String Functions</li> <li>➤ Math Functions</li> </ul>		
<b>6</b>	Join Queries <ul style="list-style-type: none"> <li>➤ Inner Join</li> <li>➤ Outer Join</li> <li>➤ Left Join</li> <li>➤ Right Join</li> </ul>		
<b>7</b>	Subqueries <ul style="list-style-type: none"> <li>➤ With IN clause</li> <li>➤ With EXISTS clause</li> </ul>		
<b>8</b>	Subqueries <ul style="list-style-type: none"> <li>➤ Nested subqueries</li> <li>➤ ANY/ALL clause</li> </ul>		
<b>9</b>	Views <ul style="list-style-type: none"> <li>➤ Creating Views (with and without check option)</li> <li>➤ Dropping views</li> </ul>		
<b>10</b>	Stored Procedures, cursors and triggers <ul style="list-style-type: none"> <li>➤ Creating stored procedure with and without parameters</li> <li>➤ Creating cursor</li> <li>➤ Creating triggers</li> </ul>		



BCA II (Sem IV)

<b>Course code:</b> CCL 407	<b>Lab course-VIII Based on CC403</b>	<b>Credit :02</b>	<b>Marks: 50</b>
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Design console applications using C#. 2. Design web application using ASP.Net		
<b>Sr. No.</b>	<b>List of Practical's</b>		
	<b>Consol Applications</b>		
1.	Write a program to display even no and odd no using C#.		
2.	Write a program to demonstrate parameter passing mechanism and out parameter.		
3.	Write a program to demonstrate type casting.		
4.	Write a program to demonstrate partial class.		
	<b>Web Applications</b>		
5.	Create web page using server controls- Textbox, List Controls, Calender, Imagebutton, Linkbutton		
6.	Develop ASP.Net Application through which user upload Image and that Image should be displayed in Image Control.		
7.	Write a program to create a web page showing use of following validation controls a. Required field validator b. Range validator c. Compare validator d. Custom validator e. Regular expression validator f. Validation summary		
8.	Write a program to create a web page passing multiple values between asp.net pages		
9.	Write a program to create a web page showing use of response, redirect and server transfer		
10.	Write a program to create a database for Medical shop system and represent data using Gridview.		
11.	Using ADO.NET, create a student database and perform operations like- insert, update and delete records.		
12.	Develop ASP.Net application for uploading Image.		
13.	Develop a ASP.Net application for recording Registration details using different controls & validators		
14.	Create application for displaying different reports.		

BCA-II (Sem IV)

Course code: CCL 408	Mini Project	Credit :02	Marks:50
<b>Course Outcomes</b>	After completion of this course student should be able to- 1. Implement fundamental domain knowledge of core courses for developing simple business applications. 2. Utilize the software development techniques, skills and modern tools.		
<b>Guidelines for Project</b>			
	1. A group of maximum <b>two to four</b> students prepare a mini project under the guidance of internal teacher. 2. Students should adopt SDLC approach 3. Project guide should provide progress report to each group & student should follow it.(Encl. Progress report ) 4. Number of Copies: The student should submit two Hard-bound copies of the Project Report. 5. The project report is duly signed by Principal or Head of Department, Project Guide and Student. 6. Acceptance/Rejection of Project Report: <ul style="list-style-type: none"> <li>○ The student should submit progress report with draft project report to the guide.</li> <li>○ Respective guide has right to suggest modifications for resubmission or accept the project.</li> <li>○ Only on acceptance of draft project report, the student should make the final copies.</li> </ul>		
	Following format for the submission of the Project Report. <b>a. Paper:</b> The Report shall be typed on white paper, A4 size, for the final submission. The Report to be submitted must be original and subsequent copies may be photocopied on any paper. <b>b. Typing:</b> The typing shall be of standard letter size, 1.5 spaced and on <b>both</b> side of the paper. (Normal text should have Times New Roman, Font size 12. Headings can have bigger size) <b>c. Margins:</b> The typing must be done in the following margins: Left -----1.5 inch, Right ----- 1 inch Top ----- 1 inch, Bottom ----- 1 inch <b>d. Front Cover:</b> The front cover should contain the following details: TOP : The title in block capitals of 6mm to 15mm letters. CENTRE: Full name in block capitals of 6mm to 10mm letters. BOTTOM: Name of the University, Course, Year of submission -all in block capitals of 6mm to 10mm letters on separate lines with proper spacing with center alignment. <b>e. Blank Sheets:</b> At the beginning and end of the report, two white black papers should be provided, one for the purpose of binding and other to be left blank.		
IV	<b>Documentation Format</b>		

	<p>a) Cover Page  b) Institute/College Recommendation  c) Guide Certificate  d) Declaration  e) Acknowledgement  f) Index  g) Chapter Scheme</p> <p><b>1) Introduction to Project</b>  -Introduction  -Existing System  -Need and scope of Computer System  -Organization Profile(Optional &amp; applicable for live project only)</p> <p><b>2) Proposed System</b>  -Objectives  -Requirement Engineering.  • Requirement Gathering  • Software Requirements</p> <p><b>3) System Analysis</b>  • System Diagram  • DFD  • ERD  • UML(if applicable)  (Note: Use advanced tools and techniques as per requirement.)</p> <p><b>4) System Design</b>  • Database Design  • Input Design &amp; its samples  • Output Design (on screen)</p> <p><b>5) Implementation</b>  - System Requirement  - Hardware  - Software  - Installation process  - User Guideline</p> <p><b>6) Reports (with valid Data)</b>  (Minimum 4 reports)</p> <p><b>7) Conclusion and Suggestions</b>  • Conclusion  • Limitations  • Suggestion</p> <p><b>Annexure</b>  • Source code(Include Main Logic source code)  • Questioner/Schedule(if used)  • Student Guide Meet Record</p> <p><b>References</b>  i) Books  ii) Journals  iii) Periodicals and Newspapers  iv) Web/Blogs</p>
--	---

<<Name of College>>

## Student Guide Meet Record

<<Year>>

<b>Title of Project</b>		<b>Class:</b>
<b>Student Names</b>	1) 2) 3) 4)	<b>Guide Name:</b>

Sr.	Date	Description	Signature of Guide	Signature of Student/s	Guide Remark
1		Problem Identification and Topic and title finalization ( 1 <sup>st</sup> week of semester)			
2		SRS submission and approval ( 6 <sup>th</sup> week of semester)			
3		Logical Design of System (DFD, System flowchart, ERD, UML diagram, Decision tables, Decision tree ,site map which is applicable) (7 <sup>th</sup> week of Semester)			
4		Database Design ((8 <sup>th</sup> week of Semester))			
5		I/O Design (with Reports) (10 <sup>th</sup> of Semester)			
6		Submission of Draft Project Report (11 <sup>th</sup> Week of semester )			
7		Submission of Final Project Report (12 <sup>th</sup> Week of semester )			

HOD/ Director/Principal