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Systel Technical Education Society's

# Systel Institute of Management & Research

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**Chairman: Hon.Hemant C.Gharate**

**Director : Dr. Hansraj M. Patil**  
(Ph.D, M.Sc., M.B.A., M.C.M., M.C.A.)

**2.6.1: Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website**

<http://nmu.ac.in/en-us/usefullinks/circulars.aspx>

<https://www.nmu.ac.in/StudentCorner/Academics/Syllabi.aspx>

## Master in Management Studies (Computer Management) [MMS (CM)]

### Program Objectives:

- The main objective of this course is to develop future managers for offices and/or software developers, support professionals, who would meet, the dynamic needs of the industry in a competitive and challenging environment.
- The program aims at providing expertise to students in different Office support system and software development area.

### The broad objectives of the Program are:

- To equip the students with requisite knowledge, skills and right attitude necessary to provide effective software development skills in a global environment.
- To prepare students for respectable career in the Software Design, Development & Testing. Also in Software Support, e-commerce, e-business, e-banking, eservices, e-governance etc. Or in business management domain where management is augmented by information communication technology.
- To develop inter-twining competence in the field of Commerce and Management, Computing Skill and Computational Tools.
- To prepare students for respectable career in the Software Design, Development & Testing. Also in Software Support, e-commerce, e-business, e-banking, e-services, e-governance etc. Or in business management domain where management is augmented by information communication technology.

- To develop inter-twinning competence in the field of Commerce and Management, Computing Skill and Computational Tools.
- To develop students as Cyber Security experts, Information System Auditors.



North Maharashtra University, Jalgaon

(NAAC Reaccredited 'A' Grade University)

FACULTY OF COMMERCE and MANAGEMENT

EQUIVALENCE OF OLD AND NEW COURSES FOR

**MASTER IN MANAGEMENT STUDIES (COMPUTER MANAGEMENT) M.M.S.(CM)**

Old Paper	Old courses (w.e.f.- July 2014) <b>MBM (CM)</b>	New Paper	New courses (w.e.f.- AY 2017-18) <b>MMS(CM)</b>
<b>Semester-I</b>			
1.1	ICT Fundamentals & Operating System	1.4	ICT Fundamentals and Office Automation
1.2	Web Designing and Web Tools	1.3	Web Designing and Web Authoring Tools
1.3	Programming concepts using C++	1.5	Programming in C
1.4	Financial Accounting for Manager (Tally ERP)	1.2	Financial Accounting
1.5	Business Management	1.1	Principles of Management
1.6	Lab -I (Based on 1.1 & 1.2)	1.6	Lab I-Practical on Tally ERP & Web Designing
1.7	Lab – II (Based on 1.3 & 1.4)	1.7	Lab II- Practical on Office Automation and C Programming
<b>Semester – II</b>			
2.1	Object Oriented Programming using C++	2.5	Object Oriented Programming using C++
2.1	RDBMS with MS-SQL Server	2.4	RDBMS
2.3	Graphics and Animation	2.1	Communication Skills
2.4	Software Engineering and Project Management	2.3	System Analysis and Design
2.5	Management Information System & ERP	2.2	Management Information System
2.6	Lab – III (Based on 2.1 & 2.2)	2.6	Lab III- Practical on RDBMS
2.7	Lab – IV (Based on 2.3 & 2.4)	2.7	Lab III- Practical on C++
<b>Semester – III</b>			
3.1	Database Administration with Oracle & D2K	3.2	Cyber Security and IT Act
3.2	VB.Net	3.5	C#.Net Programming
3.3	Advance Graphics and Animation	3.3	Graphics and Animation
3.4	E-Commerce and Website Management	3.4	Web Scripting with PHP and MySQL
3.5	ICT Applications in Business	3.1	CRM & Digital Marketing
3.6	Lab – V (Based on 3.1 & 3.2)	3.7	Lab VI- Practical on C#.Net Programming
3.7	Lab – VI (Based on 3.3 & 3.4)	3.6	Lab V- Practical on Graphics and Animation & PHP
<b>Semester – IV</b>			
4.1	ASP.Net	4.3	Internet Computing with ASP.NET
4.2	Scripting Languages	4.2	E-commerce and M-commerce
4.3	Java Programming language	4.4	Java Programming
4.4	Organization Behavior and HRM	4.1	Human Resource Management
4.5	Lab – VI (Based on 4.1 & 4.2)	4.6	Lab VII- Practical on ASP.Net

4.6	Lab – VIII (Based on 4.3 & 4.4)	4.7	Lab VIII- Practical on Java Programming
4.7	Project Work	4.5	Project Work

**Master in Management Studies (Computer Management) (AY 2017-2018) -**

<b>Code</b>	<b>Course Name</b>	<b>Course Objectives</b>
<b>1.1</b>	Principles of Management	<ul style="list-style-type: none"> <li>• To acquaint the students with the basic Business Management concept &amp; process.</li> </ul>
<b>1.2</b>	Financial Accounting	<ul style="list-style-type: none"> <li>• To prepare students about important financial accounting concepts and understand usage of</li> <li>• Tally ERP software.</li> </ul>
<b>1.3</b>	Web Designing and Web Authoring Tools	<ul style="list-style-type: none"> <li>• To prepare students in web designing using various web tools.</li> </ul>
<b>1.4</b>	ICT fundamentals & Office Automation	<ul style="list-style-type: none"> <li>• To prepare students in understanding ICT basics and to make aware of Office automation using MS- Office.</li> </ul>
<b>1.5</b>	Programming in C	<ul style="list-style-type: none"> <li>• To Train students with basic concepts of programming using C.</li> </ul>
<b>1.6</b>	Lab I-Practical on Tally ERP & Web Designing	<ul style="list-style-type: none"> <li>• To understand account terms in Tally.</li> <li>• To handle account transaction using tally.</li> <li>• To understand HTML Language.</li> </ul>
<b>1.7</b>	Lab II-Practical on Office Automation & C Programming	<ul style="list-style-type: none"> <li>• To prepare students in understanding ICT basics and to make aware of Office automation using MS- Office.</li> <li>• To Train students with basic concepts of programming using C.</li> </ul>
<b>2.1</b>	Communication Skills	<ul style="list-style-type: none"> <li>• To study the personality development of individuals in the micro perspective.</li> <li>• To provide employability skills</li> <li>• To know the process of Interview Techniques&amp; Group discussion.</li> <li>• To understand the needs and benefits of written communication.</li> </ul>
<b>2.2</b>	Management Information System	To develop the knowledge about process of MIS and its application to the business for decision making process.
<b>2.3</b>	System Analysis and Design	The course has been designed to provide a foundation of systems principles and an understanding of System development.
<b>2.4</b>	RDBMS	<ul style="list-style-type: none"> <li>• To prepare students in using and managing databases.</li> </ul>
<b>2.5</b>	Object Oriented Programming using C++	<ul style="list-style-type: none"> <li>• To train students in programming using object oriented concepts with C++.</li> </ul>
<b>2.6</b>	Lab III-Practical on RDBMS	<ul style="list-style-type: none"> <li>• To prepare students in using and managing databases.</li> </ul>
<b>2.7</b>	Lab IV-Practical on C++	<ul style="list-style-type: none"> <li>• To train students in programming using object oriented concepts with C++.</li> </ul>

**Master in Management Studies (Computer Management) (MMS) (AY 2021-2022) -**

<b>SEM</b>	<b>Subject Name</b>	<b>Course Objective</b>
1.1	Principles of Management	<ul style="list-style-type: none"> <li>To acquaint the students with the basic Business Management concept &amp; process.</li> </ul>
1.2	Financial Accounting	<ul style="list-style-type: none"> <li>To prepare students about important financial accounting concepts and understand usage of Tally ERP software.</li> </ul>
1.3	Web Designing and Web Authoring Tools	<ul style="list-style-type: none"> <li>To prepare students in web designing using various web tools.</li> </ul>
1.4	ICT fundamentals & Office Automation	<ul style="list-style-type: none"> <li>To prepare students in understanding ICT basics and to make aware of Office automation using MS- Office.</li> </ul>
1.5	Programming in C	<ul style="list-style-type: none"> <li>To Train students with basic concepts of programming using C</li> </ul>
1.6	Lab I-Practical on Tally ERP & Web Designing	<ul style="list-style-type: none"> <li>To practically train students in performing Tally ERP, to develop effective web pages using HTML CSS Bootstrap.</li> </ul>
1.7	Lab II-Practical on Office Automation & C Programming	<ul style="list-style-type: none"> <li>To practically train students in programming using C Language. Also to prepare students in Basic Office automation.</li> </ul>
2.1	Communication Skills	<ul style="list-style-type: none"> <li>To study the personality development of individuals in the micro perspective</li> </ul>
2.2	Management Information System	<ul style="list-style-type: none"> <li>To develop the knowledge about process of MIS and its application to the business for decision making process.</li> </ul>
2.3	System Analysis and Design	<ul style="list-style-type: none"> <li>The course has been designed to provide a foundation of systems principles and an understanding of System development.</li> </ul>
2.4	RDBMS	<ul style="list-style-type: none"> <li>To prepare students in using and managing databases.</li> </ul>
2.5	Object Oriented Programming using C++	<ul style="list-style-type: none"> <li>To train students in programming using object oriented concepts with C++</li> </ul>
2.6	Lab III-Practical on RDBMS	<ul style="list-style-type: none"> <li>To prepare students to acquire knowledge of Oracle administration and Developer 6i</li> </ul>
2.7	Lab IV-Practical on C++	<ul style="list-style-type: none"> <li>To practically train students in programming in object oriented way using C++.</li> </ul>
3.1	CRM & Digital Marketing	<ul style="list-style-type: none"> <li>To prepare students to acquire knowledge of CRM &amp; Digital Marketing</li> </ul>
3.2	Cyber Security and IT Act	<ul style="list-style-type: none"> <li>To study and understand the basic concepts of cryptography, network security and cyber laws.</li> </ul>

3.3	Graphics & Animation	<ul style="list-style-type: none"> <li>To prepare students to acquire the required skills to create animations and graphics, this can be helpful in building commercial websites.</li> </ul>
3.4	Web Scripting with PHP and MySQL	<ul style="list-style-type: none"> <li>To impart the knowledge of Website development using PHP among student.</li> </ul>
3.5	C#.NET Programming	<ul style="list-style-type: none"> <li>To impart the knowledge of object oriented programming using C# among student.</li> </ul>
3.6	Lab V-Practical on Graphics & Animation & PHP	To practically train students in Graphics using Flash and programming in PHP
3.7	Lab VI-Practical on C#.Net Programming	To practically train students in programming in C#.NET
4.1	Human Resource Management	<ul style="list-style-type: none"> <li>To understand importance of Human Resource Management.</li> <li>To provide essential knowledge of important function of HRM.</li> </ul>
4.2	E-commerce and M-commerce	<ul style="list-style-type: none"> <li>To prepare students to acquire the knowledge of recent trends in e-commerce. Also students are prepared for website management which can be helpful in industry.</li> </ul>
4.3	Internet Computing with ASP.NET	<ul style="list-style-type: none"> <li>To prepare students to acquire knowledge of creating interactive websites using ASP.Net.</li> </ul>
4.4	Java Programming	<ul style="list-style-type: none"> <li>To prepare students to acquire knowledge of programming language using Java. The students will be able to create applications in Java</li> </ul>
4.5	Project Work	NA
4.6	Lab VII-Practical on ASP.NET	NA
4.7	Lab VIII-Practical on Java Programming	NA

## Bachelor in Computer Application (BCA)

### Program Objectives:

- BCA course strives to create outstanding computer professionals with ethical and human values to reshape the nation's destiny. This program aims to prepare young minds for the challenging opportunities in the IT industry, nourished and supported by experts in the fields.
- The BCA Course aims at inculcating essential skills as demanded by the global software industry through interactive learning process. This also includes team-building skills, audio- visual presentations and personality development programs.
- The program enhances analytical, managerial and communication skill besides inculcating the virtues of self-study. The Curriculum has been designed to cater to the ever-changing demands of information technology along with necessary inputs from the Industry.
- The OBJECTIVE of the course is to develop skilled manpower in the various areas of software industry and Information Technology
- To enable students for pursuing respectable career through Self- Employment, Executive Employment, Entrepreneurship, Professional Career in the field of service sectors such as e Banking, Marketing, Investment, Insurance hospitality and other avenues.
- To develop inter-twining competence in the field of Commerce and Management, Computing Skill and Computational tools.
- To develop abilities for data analysis and interpretation Using ICT.
- To develop the basic programming skills to enable students to build Utility programs.
- To develop the foundation for higher studies in the field of Computer Application.
- To provide specialization in Management with technical, professional and communications skills.
- To train future industry professionals.
- To impart comprehensive knowledge with equal emphasis on theory and practice.
- To keep the students up-to-speed on all the latest and cutting-edge technologies.

## COURSE STRUCTURE

### Bachelor Of Computer Application (BCA)

w.e.f. –Academic Year 2017-18

#### First Year BCA - (Sem I & II) w.e.f. - July 2017-18

Paper	Semester -I	Paper	Semester -I
BCA 101	Foundation Course for Managers	1.4	ICT Fundamentals and Office Automation
1.2	Web Designing and Web Tools	1.3	Web Designing and Web Authoring Tools
1.3	Programming concepts using C++	1.5	Programming in C
1.4	Financial Accounting for Manager (Tally ERP)	1.2	Financial Accounting
1.5	Business Management	1.1	Principles of Management
1.6	Lab -I (Based on 1.1 & 1.2)	1.6	Lab I-Practical on Tally ERP & Web Designing
1.7	Lab – II (Based on 1.3 & 1.4)	1.7	Lab II- Practical on Office Automation and C Programming
<b>Semester – II</b>			
2.1	Object Oriented Programming using C++	2.5	Object Oriented Programming using C++
2.1	RDBMS with MS-SQL Server	2.4	RDBMS
2.3	Graphics and Animation	2.1	Communication Skills
2.4	Software Engineering and Project Management	2.3	System Analysis and Design
2.5	Management Information System & ERP	2.2	Management Information System
2.6	Lab – III (Based on 2.1 & 2.2)	2.6	Lab III- Practical on RDBMS
2.7	Lab – IV (Based on 2.3 & 2.4)	2.7	Lab III- Practical on C++
<b>Semester – III</b>			
3.1	Database Administration with Oracle & D2K	3.2	Cyber Security and IT Act
3.2	VB.Net	3.5	C#.Net Programming
3.3	Advance Graphics and Animation	3.3	Graphics and Animation
3.4	E-Commerce and Website Management	3.4	Web Scripting with PHP and MySQL
3.5	ICT Applications in Business	3.1	CRM & Digital Marketing
3.6	Lab – V (Based on 3.1 & 3.2)	3.7	Lab VI- Practical on C#.Net Programming
3.7	Lab – VI (Based on 3.3 & 3.4)	3.6	Lab V- Practical on Graphics and Animation & PHP
<b>Semester – IV</b>			
4.1	ASP.Net	4.3	Internet Computing with ASP.NET
4.2	Scripting Languages	4.2	E-commerce and M-commerce
4.3	Java Programming language	4.4	Java Programming
4.4	Organization Behavior and HRM	4.1	Human Resource Management
4.5	Lab – VI (Based on 4.1 & 4.2)	4.6	Lab VII- Practical on ASP.Net
4.6	Lab – VIII (Based on 4.3 & 4.4)	4.7	Lab VIII- Practical on Java Programming
4.7	Project Work	4.5	Project Work



**Bachelor in Computer Application (BCA) (AY 2017-2018) -**

<b>Code</b>	<b>Course Name</b>	<b>Course Objectives</b>
101	Foundation Course for Managers	<ul style="list-style-type: none"><li>• To study the fundamental Accounting concepts, terms, jargons and learn the process of recording of financial transactions in the books of Accounts. To develop the foundation for higher studies in the field of accounting.□</li></ul>
102	Computer Fundament and Networking	<ul style="list-style-type: none"><li>• To make students well familiar with computer and networking fundamentals.</li></ul>
103	Essential of Web Design I	<ul style="list-style-type: none"><li>• To make students well familiar Internet and Web designing</li></ul>
104	Programming In C	<ul style="list-style-type: none"><li>• Prepare students to acquire knowledge of programming using C. It is the precursor and inspiration for almost all of the most popular high-level languages available today.</li></ul>
105	Practical on Computer & Internet	<ul style="list-style-type: none"><li>• To practically train students in using computer and internet.</li></ul>
106	Practical on Web Design-I	<ul style="list-style-type: none"><li>• To make students well familiar with internet and HTML Script</li></ul>
107	Practical on C Programming	<ul style="list-style-type: none"><li>• To practically train students in C programming language.</li></ul>
201	Financial Accounting	<ul style="list-style-type: none"><li>• To give the practical knowledge of accounting to the students. To make the students competent in preparation of Accounts for the Business Entities.□</li></ul>
202	Professional Communication	<ul style="list-style-type: none"><li>• To impart the basic communication skills among students.</li></ul>
203	Essential of Web Design II	<ul style="list-style-type: none"><li>• To make students well familiar with JavaScript and CSS</li></ul>
204	Programming In C++	<ul style="list-style-type: none"><li>• To train students in programming using object oriented concepts with C++.</li></ul>
205	Practical on Professional Communication	<ul style="list-style-type: none"><li>• To impart basic communication skills among students</li></ul>
206	Practical on Web Design-II	<ul style="list-style-type: none"><li>• To make students well familiar with css and JavaScript</li></ul>
207	Practical on C++ Programming	<ul style="list-style-type: none"><li>• To practically train students in programming in object oriented way using C++.</li></ul>

Kavayitri Bahinabai Chaudhari North Maharashtra  
University, Jalgaon



Bachelor of Computer Application  
BCA

(At affiliated Institutes w.e.f A.Y. 2022-23)

w.e.f. Academic Year 2022-23

Summary of distribution of Credits under CBCS scheme for  
BCA



Semester wise course structure of BCA

Sem I

Total Credits=28 [Theory =16, Practical =12]

Course Code	Course Type	Subject Name	Contact Hour/Week			Distribution of Marks for Examinations					Credits
			T	P	Total	Internal		External		Total	
						T	P	T	P		
BCA 101	SEC	Fundamentals of Accounting	04	-	04	40		60		100	4
BCA 102	Core	Fundamental of Computer	04	-	04	40		60		100	4
BCA 103	Core	Programming in C – I	04	-	04	40		60		100	4
BCA 104	DSC	Web Design – I	04	-	04	40		60		100	4
BCA 105	Core	Lab on Computer Fundamental	-	04	04		40		60	100	4
BCA 106	Core	Lab on C Programming – I	-	04	04		40		60	100	4
BCA 107	DSC	Lab on Web Design – I	-	04	04		40		60	100	4

Sem II

Total Credits=28 [Theory =16, Practical =12]

Course Code	Course Type	Subject Name	Contact Hour/Week			Distribution of Marks for Examinations					Credits
			T	P	Total	Internal		External		Total	
						T	P	T	P		
BCA 201	SEC	Professional Communication Skill	04	-	04	40	-	60	-	100	4
BCA 202	Core	Database Management System	04	-	04	40	-	60	-	100	4
BCA 203	Core	Programming in C – II	04	-	04	40	-	60	-	100	4
BCA 204	DSC	Web Design - II	04	-	04	40	-	60	-	100	4
BCA 205	Core	Lab on DBMS	-	04	04	-	40	-	60	100	4
BCA 206	Core	Lab on C Programming - II	-	04	04	-	40	-	60	100	4
BCA 207	DSC	Lab on Web Design – II	-	04	04	-	40	-	60	100	4

Sem III

Total Credits=28 [Theory =16, Practical =12]

Course Code	Course Type	Subject Name	Contact Hour/Week			Distribution of Marks for Examinations					Credits
			T	P	Total	Internal		External		Total	
						T	P	T	P		
BCA 301	Core	Fundamental Mathematics and Statistics	04	-	04	40	-	60	-	100	4
BCA 302	Core	Operating System	04	-	04	40	-	60	-	100	4
BCA 303	DSC	Programming in C++	04	-	04	40	-	60	-	100	4
BCA 304	DSC	Elective I	04	-	04	40	-	60	-	100	4
		A)Web Development Technology – I									
		B)Data Analytics – I									
		C)Python Programming									
BCA 305	Core	Lab on Operating System	-	04	04	-	40	-	60	100	4
BCA 306	DSC	Lab on C ++ Programming	-	04	04	-	40	-	60	100	4
BCA 307	DSC	Lab on Elective	-	04	04	-	40	-	60	100	4

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Sem IV

Total Credits=28 [Theory =16, Practical =12]

Course Code	Course Type	Subject Name	Contact Hour/Week			Distribution of Marks for Examinations					Credits
			T	P	Total	Internal		External		Total	
						T	P	T	P		
BCA 401	Core	Software Engineering	04	-	04	40	-	60	-	100	4
BCA 402	Core	Data Structures	04	-	04	40	-	60	-	100	4
BCA 403	DSC	Java Programming	04	-	04	40	-	60	-	100	4
BCA 404	DSC	Elective II	04	-	04	40	-	60	-	100	4
		A)Web Development Technology - II									
		B)Data Analytics - II									
		C)Artificial									
BCA 305	Core	Intelligent Lab on Data Structure	-	04	04	-	40	-	60	100	4
BCA 306	DSC	Lab on Java Programming	-	04	04	-	40	-	60	100	4
BCA 307	DSC	Lab on Elective	-	04	04	-	40	-	60	100	4

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## Sem V

Total Credits=28 [Theory =16, Practical =12]

Course Code	Course Type	Subject Name	Contact Hour/Week			Distribution of Marks for Examinations					Credits
			T	P	Total	Internal		External		Total	
						T	P	T	P		
BCA 501	SEC	Employability Skill	04	-	04	40	-	60	-	100	4
BCA 502	SEC	E-Commerce and M-Commerce	04	-	04	40	-	60	-	100	4
BCA 503	DSC	Cloud Computing Application	04	-	04	40	-	60	-	100	4
BCA 504	DSC	Elective III	04	-	04	40	-	60	-	100	4
		A) Web Development Technology – III									
		B) Data Analytics – III									
		C) Machine Learning									
BCA 505	SEC	Lab on E-Commerce		04	04	-	40	-	60	100	4
BCA 506	DSC	Lab on Cloud Computing		04	04	-	40	-	60	100	4
BCA 507	DSC	Lab based on Elective I		04	04	-	40	-	60	100	4

## Sem VI

Total Credits=28 [Theory =16, Practical =12]

Course Code	Course Type	Subject Name	Contact Hour/Week			Distribution of Marks for Examinations					Credits
			T	P	Total	Internal		External		Total	
						T	P	T	P		
BCA 601	SEC	Entrepreneurship Development	04	-	04	40	-	60	-	100	4
BCA 602	Core	Cyber Security	04	-	04	40	-	60	-	100	4
BCA 603	DSC	Android Application Development	04	-	04	40	-	60	-	100	4
BCA 604	DSC	Elective IV	04	-	04	40	-	60	-	100	4
		A) Web Development Technology – IV									
		B) Data Analytics - IV									
		C) Data Mining									
BCA 605	Project	Project Development		04	04	-	40	-	60	100	4
BCA 606	DSC	Lab on Android Application Development		04	04	-	40	-	60	100	4
BCA 607	DSC	Lab based on Elective		04	04	-	40	-	60	100	4

## Program at a glance

Name of the Program	:	Bachelor of Computer Application
Apex body Approval	:	DTE, KBC NMU
Faculty	:	Science and Technology
Duration of the program	:	3 years (Comprising 6 Semesters)
Medium of the instruction and examination	:	English
Examination Pattern	:	60 % External Assessment + 40 % Internal Assessment
Passing Standards	:	Separate passing for Internal as well as External Assessment (min 40%)
Evaluation mode	:	CGPA
Total Credits of the program	:	168

### Program Specific Objectives (PSO)

#### Objectives:

BCA Program strives to create outstanding computer professionals with strong ethical and human values.

This programme aims to prepare young minds for the challenging opportunities in the IT industry.

The BCA Program aims at inculcating essential skills like Communication, Entrepreneurship Development & employability Skills as demanded by the global software industry through interactive learning process.

The objective of the course is to develop skilled manpower in the various areas of software industry and Information Technology.

#### Program Outcome

PO1: At the end of the program students understand, analyze and develop computer programs in the areas like Web Design, Database manipulation, Windows & Mobile Application.

PO2: At the end of the program students understand, object-oriented programming features through various programming languages.

PO3: At the end of the program students are able to create dynamic, Interactive webpage's using various web technologies.

PO4: At the end of the program students understand the use of structured query language and its syntax, transactions, database recovery and techniques for query optimization.

PO5: At the end of the program students are able to work in the IT sector as system engineer, software tester, junior programmer, web developer, system administrator, software developer etc.

PO6: If chosen particular elective at the end of the program students are able to analyze very large data sets in the context of real world problems using various data analytical tools.

PO7: If chosen particular elective it will help students to develop in depth understanding of the key technologies in AI, data mining & machine learning.

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**Bachelor of Computer Application (BCA)**  
**(W.E.F. June 2022)**

<b>Course Code</b>	<b>Sem. – I</b>	<b>Course Code</b>	<b>Sem. – II</b>
BCA 101	Fundamentals of Accounting	BCA 201	Professional Communication Skill
BCA 102	Fundamental of Computer	BCA 202	Database Management System
BCA 103	Programming in C – I	BCA 203	Programming in C – II
BCA 104	Web Design – I	BCA 204	Web Design - II
BCA 105	Lab on Computer Fundamental	BCA 205	Lab on DBMS
BCA 106	Lab on C Programming – I	BCA 206	Lab on C Programming - II
BCA 107	Lab on Web Design – I	BCA 207	Lab on Web Design – II
<b>Course Code</b>	<b>Sem. – III</b>	<b>Course Code</b>	<b>Sem. – IV</b>
BCA 301	Fundamental Mathematics and Statistics	BCA 401	Software Engineering
BCA 302	Operating System	BCA 402	Data Structures
BCA 303	Programming in C++	BCA 403	Java Programming
BCA 304	A) Web Development Technology – I	BCA 404	A) Web Development Technology - II
	B) Data Analytics – I		B) Data Analytics - I
	C) Python Programming		C) Artificial Intelligent
BCA 305	Lab on Operating System	BCA 405	Lab on Data Structure
BCA 306	Lab on C ++ Programming	BCA 406	Lab on Java Programming
BCA 307	A) Lab on Web Development Technology – I	BCA 407	A) Lab on Web Development Technology - II
	B) Lab on Data Analytics – I		B) Lab on Data Analytics - I
	C) Lab on Python Programming		C) Lab on Artificial Intelligent
<b>Course Code</b>	<b>Sem. – V</b>	<b>Course Code</b>	<b>Sem. – VI</b>
BCA 501	Employability Skill	BCA 601	Entrepreneurship Development
BCA 502	E-Commerce and M-Commerce	BCA 602	Cyber Security
BCA 503	Cloud Computing Application	BCA 603	Android Application Development
BCA 504	A) Web Development Technology – III	BCA 604	A) Web Development Technology – IV
	B) Data Analytics – III		B) Data Analytics - IV
	C) Machine Learning		C) Data Mining
BCA 505	Lab on E-Commerce	BCA 605	Project
BCA 506	Lab on Cloud Computing	BCA 606	Lab on Android Application Development
BCA 507	A) Lab on Web Development Technology – III	BCA 607	A) Lab on Web Development Technology – IV
	B) Lab on Data Analytics - III		B) Lab on Data Analytics - IV
	C) Lab on Machine Learning Using Python		C)Lab on Data Mining



# Semester – I



**Kavayitri Bahinabai Chaudhari**  
**North Maharashtra University, Jalgaon**  
**Faculty of Science and Technology**  
**BACHELOR OF COMPUTER APPLICATIONS (BCA)**  
**BCA 101 - Fundamentals of Accounting**  
**W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 101</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>02</b>

**Course Outcomes – At the end of the course, student will be able to:**

1. To understand fundamental concepts of financial accounting.
2. To understand the basics of cost accounting.
3. To maintain and record financial transactions in books of accounts.
4. To prepare final accounts of sole proprietary business.
5. To prepare Cost Sheet and record the transactions of materials.

**Unit 1 – Introduction to Accounting :(theory only) 06L 15 M**

- 1.1 Meaning and definition of Financial Accounting.
- 1.2 Objectives and scope of Financial Accounting,
- 1.3 Meaning and use of Book Keeping
- 1.4 Accounting v/s Book Keeping
- 1.5 Advantages and Limitations of Financial Accounting.

**Unit 2 - Basics of Accounting (theory only) 08L 15M**

- 2.1 Types of Accounting
- 2.2 Golden Rules of Accounting.
- 2.3 Double entry system in Accounting
- 2.4 Terms used in accounting : Debtors, Creditors, Bill Receivable, Bills Payable, Credit Note ,Debit Note ,Petty Cash ,Contra Entry ,Trade Discount ,Cash Discount, Suspense A/c
- 2.5 Users of accounting information

**Unit 3 –Fundamentals of Book Keeping & 12L 15 M**

**Recording of transactions (Practical Problems)**

- 3.1 Concept and Format of Journal
- 3.2 Recording of transactions in Journal
- 3.3 Meaning and Format of Ledger
- 3.4 Posting of transactions in Ledgers
- 3.5 Rectification of Errors

**Unit 4 – Preparation of Final Accounts of Sole 16L 15M**

**Proprietorship Business (Practical Problems)**

- 4.1 Meaning, Importance & Objectives of Final Accounts
- 4.2 Preparation of Trial Balance
- 4.3 Preparation of Trading A/c., Manufacturing A/c.
- 4.4. Preparation of Profit & Loss A/c.
- 4.5 Preparation of Balance Sheet- Adjustments- Outstanding Expenses, Prepaid Expenses, Accrued Incomes, Depreciation

<b>Unit 5 –Fundamentals of Cost Accounting (Theory and Problem)</b>	<b>08L 15 M</b>
5.1 Cost, Expense, Loss : Meaning 5.2 Costing, Cost Accounting 5.3 Types of Costs on the basis of various criteria 5.4 Advantages and Limitations of Cost Accounting 5.5 Difference between Financial Accounting and Cost Accounting 5.6 Cost Sheet: Importance and objectives of Cost Sheet 5.7 Format of Cost Sheet & Preparation of Cost Sheet( <b>Problem</b> )	
<b>Unit 6 – Chapter 6 Material Control (Theory and Problem)</b>	<b>10L 15M</b>
6.1 Meaning & Importance of Materials accounting and control 6.2 Different Level of Materials & their Calculations :Economic Order Quantity (EOQ), Maximum Level, Minimum Level, Average Level, Reorder Level, Danger Level ( <b>Problems</b> ) 6.3 Problems on Preparation of Store ledger under FIFO, LIFO, Simple Average Method ( <b>Problems</b> )	
<b>Exam Pattern -</b>	
<b>Reference Books -</b>	
1. Introduction to Accountancy by T.S. Gerwal, S.C. Gupta- S.Chand Publication- 8'th Edition, (ISBN-108121905699) 2. Financial Accounting by Bhushan Kumar Goyal, H.N.Tiwari- International Book House Pvt. Ltd.- First Edition (ISBN-9789381335420) 3. Fundamentals of Accounting by Dr. S.N. Maheshwari, Dr.S.K. Maheshwari- Vikas Publishing House (ISBN-139788180544491) 4. Accounting for Management by T. Vijaykumar, - (2010) – Tata McGraw Hill (ISBN-139780070090170)	



**KavayitriBahinabaiChaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 102–Fundamentals of Computer  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 102</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>02</b>

**Course Outcomes – At the end of the course, student will be able to:**

1. Acquire the knowledge of fundamentals of Computer and Operating System.
2. Develop problem solving skill through algorithms and flowcharts.
3. Understand the basics of computer networking and internet.

**Unit 1 –Computer Fundamentals: 10L 15 M**

History & generation of computer, Block diagram of computer system, Types of computers  
Definition- Software, Hardware, Compiler, Interpreter, Characteristics & applications of Computer,  
Data Representation: Introduction to Number system: decimal, binary, octal and hexadecimal,  
Conversion in Number System, Character representation: ASCII

**Unit 2 -Procedural Programming Paradigms and Platforms 10L 15M**

Definition - Algorithm, Flowchart, Flowchart symbols, Examples for constructing algorithm and flowchart for simple programs (Minimum 5) , computer programming platforms (Hardware, software, server and cloud based)

**Unit 3 –Operating System 10L 15 M**

Definition, Need and Function of an operating system,  
Types of operating system, Comparative study of various operating systems (DOS, Linux and Windows)

**Unit 4 –Memory Management Concept 10L 15M**

Types of Memory Primary– RAM, ROM, PROM, EPROM,  
Secondary– Magnetic Disk, Hard Disk and CD  
Definitions and Concept – Paging, Segmentation, Deadlock

**Unit 5 – Networking and Internet 10L 15 M**

What is Computer network? Types of Networks: LAN, MAN, WAN, Topologies: Star, Tree, Bus, Ring, Mesh, Fully Connected, Wireless Networks, Working of Internet, Use of Internet, Applications of Internet, Study of Web Browsers, Search Engines, Creating an E-mail Account, Sending & Receiving E-mail (with attachment).

**Unit 6 –Office Automation 10L 15M**

Basic Concepts, MS-Word- demonstration of text formatting, tables, shapes, smart-arts, charts, Spreadsheets- Functions- (Aggregate function) , Macros. Presentation Tool Design Slides (using Text, images, charts, clipart), Slide Animation, Template and theme creation

**Exam Pattern -**

## Reference Books -

V.RajaRaman, "Fundamentals of computer" (PHI Publication) **ISBN**10:8120340116

Roger Hunt and John Shelley, "Computer and common sense" (PHI Publication) **ISBN**10:0131646737

Andrew S. Tanenbaum, "Computer Networks" – Fourth Edition. **ISBN number** 0130661023 Hurwitz

Judith S. and Daniel Kirsch, "Cloud Computing for Dummies". ISBN

Godbole Achyut and Kahate Atul, "Web Technologies: TCP/IP, Web/ Java Programming, and Cloud Computing, ", 3e Tata McGraw-Hill Education ISBN: 9332900914, 9789332900912.



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 103 - Programming in C - I  
W.E.F. 2022-23**

**[Total Marks: External 60 + Internal 40 = 100 Marks]**

Semester	I	CIE Marks :	40
Course Code	BCA 103	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	02

**Course Outcomes** – At the end of the course, student will be able to:

1. Understand the basic concepts of C Programming for problem-solving and Illustrate the C data types, syntax and constructs.
2. Illustrate C for decision making, branching and looping statements
3. Understand the concept of Array and Strings to solve different problems.

**Unit 1 – Preliminary Concepts**

**10L 15 M**

- History of 'C' Programming language
- Applications and Features
- Concept of Structured Programming
- Structure of C-program
- Compilation, Execution and Debugging of C-program, Types of Errors
- Introduction to IDE, Types of IDEs: Turbo C++, Textpad, DevCPP, Code block etc

**Unit 2 - Basics of 'C' Program**

**10L 15M**

- C character set, Tokens : identifiers, keywords, Constants, Strings, Special Symbols and Operators
- Variables, Data types and Qualifiers, Assignment statement, Comments
- Input Output Statements (Standard and formatted)
- Introduction and features of 'C' preprocessor Directives: #define, File inclusion (#include)

**Unit 3 – Operators and Expression**

**10L 15 M**

- Operators – Arithmetic, Relational, Logical, Assignment, Increment-Decrement, Conditional Operator, Bitwise, Special Operator (Comma, sizeof), Operator hierarchy & associativity
- Type Conversion – implicit and explicit

**Unit 4 – Control Statements**

**10L 15M**

- If Statement, if-else Statement, nested if-else Statement, else-if ladder, Switch Statement
- Break, continue and goto statements
- Looping Concepts: While, do-while, for loop Nested loops Concept

**Unit 5 – Arrays and Strings**

**10L 15 M**

- Definition: Array: declaration and Initialization
- Types of array (One Dimensional and Multidimensional)
- Advantages and disadvantages of array
- Applications of array
- Strings, Standard library string function: strlen(), strcpy(), strcat(), strcmp() etc.

**Unit 6 - C Libraries**

**10L 15M**

- Introduction to C Programming Libraries: stdio.h, conio.h, stdlib.h, math.h, graphics.h, time.h,

ctype.h

- Math.h- abs (), sqrt( ), pow( ), ceil( ), floor( )
- Time.h – getdate(),clock(),time(),difftime()
- Ctype.h- islower(),isupper(), isalnum(), isdigit()
- Stdlib.h – exit(),random()

#### **Exam Pattern -**

#### **Reference Books -**

- Denis Ritchie. “C” Programming – Prentice Hall Software Series- ISBN. 10 9 8 7
- Yashwant P. Kanetkar - ANSI C ,BPB publication. ISBN: 9788183333245
- Byron Gottfried – Programming with C –Tata McGRAW-Hill ISBN-10: 0070145903
- Yashwant P. Kanetkar -Understanding pointers in “C” -BPB publication. ISBN-13: 978-8176563581
- E.Balguruswami -Programming in ANSI- C- Tata McGRAW-Hill- ISBN-10: 933921966X
- Mike McGrath - C programming in easy step – Wiley publication ISBN-10: 1840785446



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 104 - Web Design - I  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 104</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>02</b>

**Course Outcomes** – At the end of the course, student will be able to:

4. Acquainted with elements, Tags and basic structure of HTML files.
5. Up skills the knowledge of basic and advanced web designing.
6. Students were implement effective use of List and Tables.
7. Students were implement effective web page navigation.
8. Students were capable to design web page layout
9. Students were understood and implement use of style sheet.

**Unit 1 –Introduction to Web**

**10L 15 M**

Introduction to Internet, Advantages of Internet, Working of Internet, World Wide Web (WWW), Hypertext Transfer Protocol (HTTP), Universal Resource Locator (URL), Introduction to Web Browser and Web server, Introduction to Web page, Static and Dynamic Web page,

**Unit 2 - Fundamentals of HTML**

**10L 15M**

Introduction to HTML, Basic structure of HTML document, Formatting Text, Font Tags and Attributes, Headings Tags, Image Tag and Attributes, Background Color and Background Images, Inserting Audio and Video Files, Marquee Tag and Attributes

**Unit 3 – List, Hyper link and Table**

**10L 15 M**

List Tag - Ordered List, Unordered List, Definition List, Introduction to Hyperlink, Internal and External Hyperlink, Image Link, Table Tags & Attributes, Cell Spacing, Cell Padding, Row Span, Col Span

**Unit 4 – Frame, Frameset and Form**

**10L 15M**

Frame, Frameset,Creating Framesets, Target Frameset, Form Tag and Attributes, Form Elements - Textbox, Text Area, List Box, Radio Button, Checkbox, Submit and Reset Button

**Unit 5 – Introduction to CSS**

**10L 15 M**

Basic of CSS, Advantages of CSS, Role of CSS in Web Designing, CSS Structure and Syntax, Internal

CSS, Inline CSS, External CSS, Font Properties of CSS

**Unit 6 – CSS Selectors**

**10L 15M**

Selectors and declarations, Element Selector, Class Selector, ID Selector, Child Selector, Universal Selector, Group Selector

**Exam Pattern -**

**Reference Books -**

Textbook of Web Designing By Joel Sklar, Cengage Learning Publication 2009

Web designing in Nut Shell (Desktop Quick Reference) by Jennifer Niederst Publication – O'Reilly publication

Designing web navigation by James Kalbach Publication – O'Reilly publication Textbook of Web Designing By Joel Sklar, Cengage Learning Publication 2009 ISBN, 1423901940





**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 105 - Lab on Computer Fundamental  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	I	CIE Marks :	40
Course Code	BCA 105	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	03

**Course Outcomes** – At the end of the course, student will be able to:

1. Students can able to understand the installation of operating system.
2. Students can understand basic DOS command, and different browser.
3. Student understand different platforms, Internet, mails, tables
4. Students can learn text formatting and table formatting.
5. Students capable to design power point presentation, tables, shapes, smart arts and charts

**Assignments :**

1. Installation of Operating System (Linux and Windows).
2. Run different commands of MS DOS – CD, DIR, COPY, REN, CLS, MD, RD, etc.
3. Study different web Browsers- Internet Explorer, Fire fox, downloading of files
4. Connect the Internet- open any website of your choice and download the WebPages.
5. Study different platforms – Hardware, Software, Server and Cloud.
6. Create your E-Mail ID on any free E-Mail Server.
7. Login through your E-Mail ID and do the following:
  - a. Read your mail
  - b. Compose a new Mail
  - c. Send the Mail to one person
  - d. Send the same Mail to various persons
  - e. Forward the Mail
  - f. Delete the Mail
  - g. Send file as attachment
8. Create and demonstrate of text formatting, tables, shapes, smart-arts, charts.
9. Create a spreadsheet which will demonstrate use of aggregate function.
10. Create and demonstrate power point presentation with animation



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 106 - Practical on Web Design - I  
W.E.F. 2022-23  
[Total Marks: External60 + Internal40 =100  
Marks]**

Semester	I	CIE Marks :	40
Course Code	BCA 106	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	03

**Course Outcomes** – At the end of the course, student will be able to:

1. Students were able to design consistent look and feel web pages.
2. Students were capable to use multimedia in web page.
3. Students were implement effective web page navigation.
4. Students were capable to design web page layout
5. Students were implement use of style sheet.

**Assignments :**

1. Create web page using basic HTML tags.
2. Create web page using Different Formatting tag.
3. Create Web page with different Images.
4. Create web page using Marquee Tag
5. Create a web page using different List tag.
6. Create web page using Anchor Tag (Internal Link and External Link )
7. Create web page to design time table of your college using Table tag.
8. Create web page inserting audio and video files.
9. Design a web page using Frames and Frameset Tag.
10. Design webpage of College Admission Form.
11. Design a web page using Inline and Internal CSS
12. Demonstrate the use of External CSS
13. Create web page to set background color using CSS.



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 107-Lab on C Programming  
W.E.F. 2022-23  
[Total Marks: External60 + Internal40 =100  
Marks]**

Semester	I	CIE Marks :	40
Course Code	BCA 107	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	03

**Course Outcomes** – At the end of the course, student will be able to:

1. Students understand the input output functions.
2. Students can understand the use of various operator.
3. Students can understand the use of control statements.
4. Students can design the various expressions in C
5. Students can understand the array and its type.

**Assignments :**

1. Write a program using standard Input and Output Statements.
2. Write a program using formatted input output statements also study various format String and Escape sequence characters.
3. Write a program to illustrate various operators like arithmetic, relational, logical, Conditional etc.
4. Write a program to illustrate various control statements (if, if-else, nested if-else, switch)
5. Write a program to check whether the number is palindrome or not.
6. Write a program to check whether the number is Armstrong or not.
7. Write a program to generate Fibonacci series up to given term.
8. Write a program to find factorial of given number.
9. Write a program for print the table of 1 to 5 using nested loop.
10. Write a program to check whether the string is palindrome or not.
11. Write a program to demonstrate concept of array.
  - i) One dimensional
  - ii) Two dimensional
12. Write a program to demonstrate various standard library functions.

# Semester – II



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 201 –Professional Communication  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 201</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>02</b>

**Course Outcomes – At the end of the course, student will be able to:**

1. To develop his verbal and non verbal communication ability
2. To communicate with people effectively and confidently.
3. To draft effective business correspondence documents.
4. To make and present well designed and informative presentations

**Unit 1 – Introduction to Communication**

**06L 15 M**

- 1.1. Introduction
- 1.2. Meaning
- 1.3. Definition
- 1.4. Process, importance.
- 1.5. Principles of effective communication
- 1.6. Scope of Business communication - Internal & External
- 1.7. Barriers to Communication, Overcoming the barriers

**Unit 2 - Listening Skills**

**08L 15M**

- 2.1. Types of Listening ( theory /definition )
- 2.2. Tips for Effective Listening
- 2.3. Academic Listening- ( lecturing )
- 2.4. Listening to Talks and Presentations
- 2.5. Listening to Announcements- (railway/ bus stations/ airport / stadium announcement etc.)
- 2.6. Listening to Radio and Television

**Unit 3 –Oral Communication & Presentation Skills**

**12L 15 M**

- 3.1 Need for Dialogue and Conversation Skills
- 3.2 Skills need for Dialogue
- 3.3 Clear & pleasant Speech
- 3.4 Speakers Appearance and Personality
- 3.5 Preparing text and visual material for presentation
- 3.6. Use of ICT tools for communication and presentation

**Unit 4 –Soft Skills**

**16L 15M**

- 4.1. Empathy  
(Understanding of someone else's point of view)
- 4.2. Intrapersonal skills
- 4.3. Interpersonal skills
- 4.4. Problem solving
- 4.5. Reflective thinking, Critical thinking
- 4.6. Negotiation skills

**Unit 5 –Basics of English**

**08L 15 M**

- 5.1 Parts of Speech- Noun, Pronoun, Verb, Adjectives, Adverb, Conjunction, Preposition, Interjection  
5.2 Tenses in a Nutshell -For proper sentence construction.  
5.3 Punctuation: Commas, Semi-colons, colons, Hyphens & Dashes, Apostrophes  
5.4 Vocabulary Building -; Antonyms and Synonyms; Prefixes and Suffixes

**Unit 6 – Written Communication**

**10L 15M**

- 6.1 Letter writing, Essentials of Good Business letters  
6.2 Types of letters: Types of Application Letters- Application for Job, Application for Leave.  
6.3. Preparing Resume for Job  
6.4 Email drafting and Etiquettes  
6.5. Preparing agenda and writing minutes of meetings

**Exam Pattern -**

**Reference Books -**

1. Business Communication by Urmila Rai &S.M. Rai, Ninth Revised Edition (2010) (ISBN-83-8318-438-3) Himalaya Publishing House
2. Effective Business Communication by Asha Kaul, Second Edition (2015) (ISBN-789390464777)
3. THI Learning Pvt. Ltd., Business Communication by K.K. Sinha, Galgotia (2003)(ISBN-81-85989-36-2)
4. Business Communication by M. Balasubramanyam, (2003) (ISBN-13-9788-176-639118), Kalyani Publications



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 202–Database Management System  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 202</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>02</b>

**Course Outcomes** – At the end of the course, student will be able to:

1. Introduction to the basic concepts of database management systems.
2. Learning to design databases using ER modeling.
3. Learning to apply integrity constraints.
4. To understand and demonstrate database schema.
5. Understand and demonstrate Relational databases, SQL.

**Unit 1 – Basics:**

**10L 5 M**

What is Data?, What is Information?, What is Data management?, What is Optimization?,  
Preprocessing of Data, Importance of Data Quality, Introduction to DBMS softwares

**Unit 2 - Database Systems:**

**10L 10M**

Introduction of File Processing System, Introduction of DBMS, Difference between File processing system & DBMS, Applications of DBMS, View of data, Database Languages, Database Users

**Unit 3 –Data Models:**

**10L 10 M**

Relational Model, Network Model, Hierarchical Model, Entity Relationship Model.

**Unit 4 – Integrity Constraints:**

**10L 10M**

Primary Key, Foreign Key, Candidate Key, Super Key, Null, Default, Not Null, Check constraint, Entity Integrity, Referential Integrity

**Unit 5 – Relational Database Design :**

**08L 15 M**

Normalization, Normal Form: 1 NF, 2 NF, 3 NF, BCNF

**Unit 6 – Structured Query Language (SQL):**

**10L 15M**

Introduction to SQL, Data types, Operators, Working with tables, Introduction to DML, TCL, DDL, DCL, Functions: Numeric Function, Character Function, Date Function, Conversion Function, Group Functions. Sub Queries, view, Sequence, Set Operators, Joins, Inner joins, Equi, Non Equi, Self-join & Outer Joins.

**Exam Pattern -**

**Reference Books -**

- Database System Concepts: - Abraham Silberschatz, Henry F. Korth& S. Sudarshan, McGrawHill ISBN 978-0-07-352332-3
- Introduction to Database Management Systems, by – AtulKahate (Pearson Education) ISBN 9788131700785
- Oracle PL/SQL by Example, Rosenweig, Pearson Education ISBN 10: 0133796787



**Kavayitri Bahinabai Chaudhari  
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Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 203–Programming in C – II  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 203</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>02</b>

**Course Outcomes – At the end of the course, student will be able to:**

1. Apply the concepts of Function modules, its usage
2. Apply the concepts of memory allocation using Pointers
3. Understand the concepts of structures and unions: declaration, initialization and implementation.
4. Learn to draw different graphics objects.
5. Learn to store and apply the data using files.

**Unit 1 – Function: 10 L 12M**

- Definition, Need of Function, prototype, passing parameters(Call by value and Call by reference)
- Scope of variable
- Functionwithreturnand Functionwithargument
- Recursion
- Storageclasses

**Unit 2 –Pointers: 14L 10M**

- Introduction: Defination and uses
- Declaration and Initialization
- Operations on Pointers: Pointer Arithmetic,Array of Pointer, Function and Pointer, Pointer to pointer
- Dynamic memory allocation(malloc(),calloc(),realloc()) and releasing dynamically allocated memory(free(),flush()).

**Unit 3 –Structure and Union: 12L 12 M**

- Introduction. Declaration and accessing of structure and union
- Need of structure and union, Difference between structure and union
- Nested structure
- Array of structure

**Unit 4 – Graphics : 12L 12M**

- Introduction to Graphics in C
- Graphics functions: Initgraph(), putpixel(),closegraph(),outtextxy(), setcolor(),line(),circle(),rectangle(),ellipse(),arc(), bar()

**Unit 5 – File Handling in C : 12L 12M**

- Concept of files, records, field
- File Processing-fopen() , fclose(),fprintf(),fscanf(),getc(), putc(),getw(),putw() etc.
- Various mode of file opening and closing files.
- Command line arguments

**Exam Pattern -**

**Reference Books -**

- Denis Ritchie. "C" Programming – Prentice Hall Software Series- ISBN. 10 9 8 7
- Yashwant P. Kanetkar - ANSI C ,BPB publication. ISBN: 9788183333245
- Byron Gottfried – Programming with C –Tata McGRAW-Hill ISBN-10: 0070145903
- Yashwant P. Kanetkar -Understanding pointers in "C" -BPB publication. ISBN-13: 978-8176563581
- E.Balguruswami -Programming in ANSI- C- Tata McGRAW-Hill- ISBN-10: 933921966X
- Mike McGrath - C programming in easy step – Wiley publication ISBN-10: 1840785446





**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 204-Web Design - II  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	II	CIE Marks :	40
Course Code	BCA 204	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	02

**Course Outcomes** – At the end of the course, student will be able to:

1. Student were able to embed JavaScript in web page
2. Students successfully added interactivity in web page
3. Students were applied validation on web form
4. Students were implemented different events.
5. Students were familiar with bootstrap framework.

**Unit 1 –Introduction to Web Site Development & Java Script 10L 15M**

Web Site Development, Web Site Development Phases, Web Site Authoring tools, Web Site Development Model (RAD), Meaning of Scripting Language, Types of Scripting Language- JavaScript, VBScript, ASP, PHP, Differences between Client-Side &Server-Side Scripting, Introduction to Java Script, Advantages of JavaScript, Limitation of JavaScript

**Unit 2 –Working with JavaScript 10L 15M**

Embed JavaScript into HTML, Data Types, Creating Variable , Operators & Expressions, JavaScript Comments

**Unit 3 – JavaScript Interactivity 10L 15M**

Introduction to Function, Working with Function, Calling function, Built-in String function, Condition Checking-if-else statement, Switch Case Statement, Looping Statements - for LoopWhile Loop

**Unit 4 – Dialog Box and Events 10L 15M**

Dialog Boxes - Alert Dialog Box, Confirm Dialog Box, Prompt Dialog Box, JavaScript Events - onclick, onmouseover, onmouseout, onkeypress, onkeydown, onkeyup,onfocus, onload,onunload,onblur, onsubmit

**Unit 5 – JavaScript Objects 10L 15M**

Array Object, Date Object, Math Object, Form Object

**Unit 6 – Bootstrap and Responsive Design 10L 15M**

Introduction to Bootstrap, Creating simple page, Layout of Bootstrap, Grid System, Bootstrap components – Buttons, Horizontal Naves, Dropdown,

**Exam Pattern -**

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**Reference Books -**

The ABC's of Java Script by Lee Purcell Mary Jane Mara, BPB Publication .ISBN: 8170298261.

The Complete Reference – Web Design, Thomas A. Powell, TMH, ISBN 0-07-041186. How to become webmaster in 14 days, James L Mohler, Techmedia ISBN 1575211696.

HTML, DHTML, JavaScript, Perl & CGI by Ivan Bayross, BPB Publishing ... ISBN: 8176562742

Web References: [www.w3c.org](http://www.w3c.org), [www.sybex.com](http://www.sybex.com) ISBN 0-07-041186

Web Enabled Commercial Application Development using HTML, DHTML, Java Script,PERL ISBN 13: 9788183330084.

Bootstrap 4 Quick Start: Responsive Web Design and Development Basics for Beginners (Bootstrap 4 Tutorial Book 1)Jacob Lett



**Kavayitri Bahinabai Chaudhari  
North Maharashtra University, Jalgaon  
Faculty of Science and Technology  
BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 205 - Lab on DBMS  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	<b>I</b>	CIE Marks :	<b>40</b>
Course Code	<b>BCA 205</b>	SEE Marks :	<b>60</b>
Contact Hours (L.T.P)	<b>4:0:0</b>	Exam Hours :	<b>03</b>

**Course Outcomes** – At the end of the course, student will be able to:

1. Students can able to create the database.
2. Students can understand basic database commands.
3. Students can understand constraint.
4. Students capable to design SQL using different clause.

**Assignments :**

1. Demonstration of creating database
2. Create table insert 10 records in it.
3. Demonstrate to INSERT, UPDATE, and DELETE Records in Table.
4. Demonstrate to SELECT with clauses
5. Demonstrate to Alter Table (Add Column, Delete Column, Rename, Modify Column)
6. Demonstrate integrity constraints.  
PRIMARY KEY,  
FOREIGN KEY  
CHECK  
NOT NULL  
DEFAULT
7. Demonstrate use of operators.
8. Query based on operators and joins • Simple and nested query
9. Write down SQL by using i. WHERE Clause ii. GROUP BY ii. HAVING CLAUSE 10.  
Write down SQL by using i. Aggregate functions ii. Date functions iii. String functions



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BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 206-Lab On C Programming - II  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	II	CIE Marks :	40
Course Code	BCA 206	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	03

**Course Outcomes -**

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

1. Student were able to understand the concept of Function techniques
2. Students were able to understand the storage classes
3. Students were able to understand pointer and its uses.
4. Students were able to design the basic graphics objects
5. Students were understand the operations on file and command line argument.

**Assignments :**

1. Write a program to illustrate concept of function using call by value.
2. Write a program to illustrate concept of function using call by reference.
3. Write a program to illustrate concept of recursion.
4. Write a program to demonstrate extern, static variables.
5. Write a program to demonstrate pointers to arrays.
6. Write a program to demonstrate pointers to function.
7. Write a program to pointers to pointer.
8. Write a program to demonstrate structure.
9. Write a program to demonstrate union.
10. Write a program to demonstrate various graphics function.
11. Write a program to implement read and write operations on file.
12. Write a program to demonstrate command line arguments



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BACHELOR OF COMPUTER APPLICATIONS (BCA)  
BCA 207-Lab on OnWeb Design - II  
W.E.F. 2022-23**

**[Total Marks: External60 + Internal40 =100 Marks]**

Semester	II	CIE Marks :	40
Course Code	BCA 207	SEE Marks :	60
Contact Hours (L.T.P)	4:0:0	Exam Hours :	03

**Course Outcomes -**

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

1. Student were able to develop web page using JavaScript
2. Students successfully added interactivity features in web page
3. Students were implemented validation on web form
4. Students were implemented different events.
5. Students were familiar with bootstrap framework.

**Assignments :**

- 1: Write a program to embed JavaScript into HTML.
- 2: Write a JavaScript code to demonstrate Conditional Statements
- 3: Write a JavaScript code to demonstrate Looping Statements
- 4: Write JavaScript code to demonstrate different string functions.
- 5: Write JavaScript code to demonstrate onblur, onfocus, onload, onsubmit.
- 6: Write JavaScript code to demonstrate onkeypress, onmouseover, onmouseout.
- 7: Write a program to perform addition of two numbers using web form.
- 8: Create a HTML page to demonstrate Date object using JavaScript.
- 9: Write JavaScript code to demonstrate use of Dialog Boxes.
- 10: Write a JavaScript to apply form validation – not null, number, string etc.
- 11: Create simple registration form using Bootstrap.
- 12: Create Mini Website