

Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**  
(Autonomous)



**Structure and Curriculum of Four Year Multidisciplinary  
Degree (Honors) Programme with Multiple Entry and  
Exit option**

**Undergraduate Programme of Science and Technology**  
**B.Sc. (Degree) in Computer Application**

**Board of Studies  
in  
Computer Application**

**Rajarshi Shahu Mahavidyalaya, Latur**  
(Autonomous)

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)

**w.e.f. June, 2023**

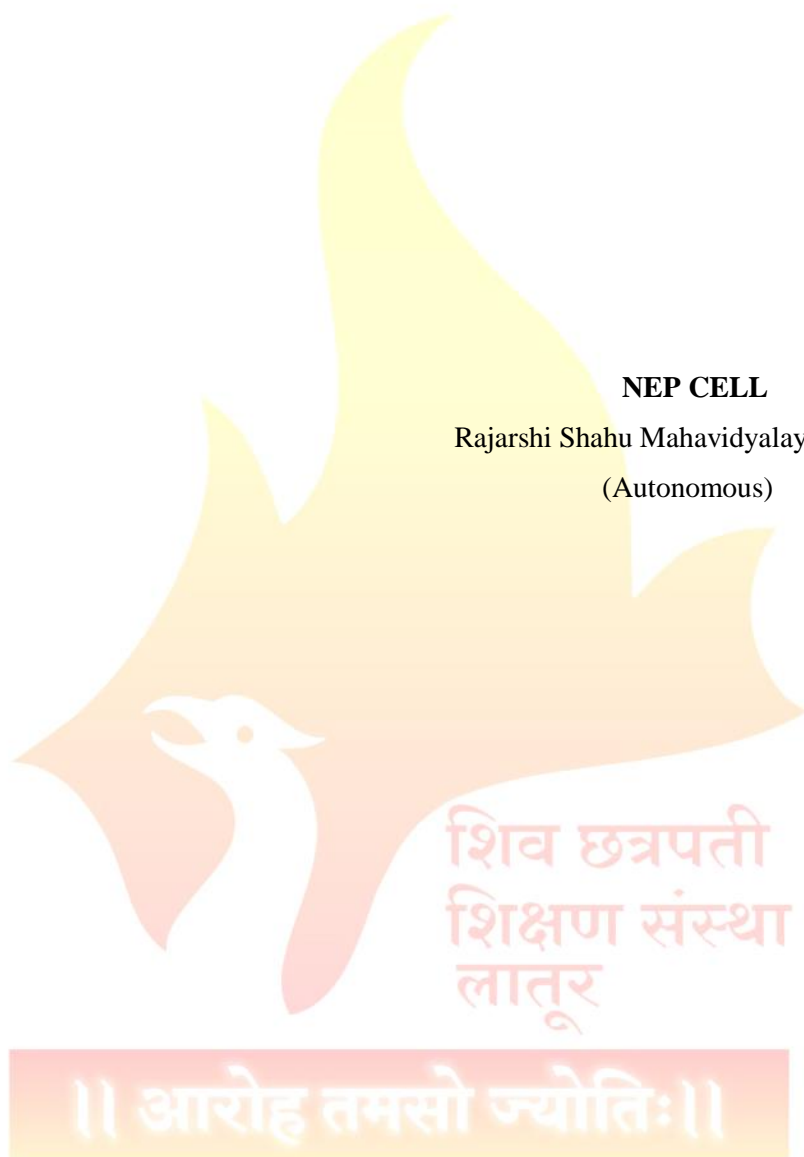
**(In Accordance with NEP-2020)**

## **Review Statement**

The NEP CELL reviewed the Curriculum of **B.Sc. (Degree) in Computer Application** Programme to be effective from the **Academic Year 2023-24**. It was found that, the structure is as per the NEP-2020 guidelines of Govt. of Maharashtra.

**Date:** 14/07/2023

**Place:** Latur



**NEP CELL**

Rajarshi Shahu Mahavidyalaya, Latur  
(Autonomous)

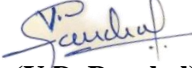
Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)

## CERTIFICATE

I hereby certify that the documents attached are the Bonafide copies of the curriculum of **B.Sc. (Degree) in Computer Application** Programme to be effective from the **Academic Year 2023-24**.

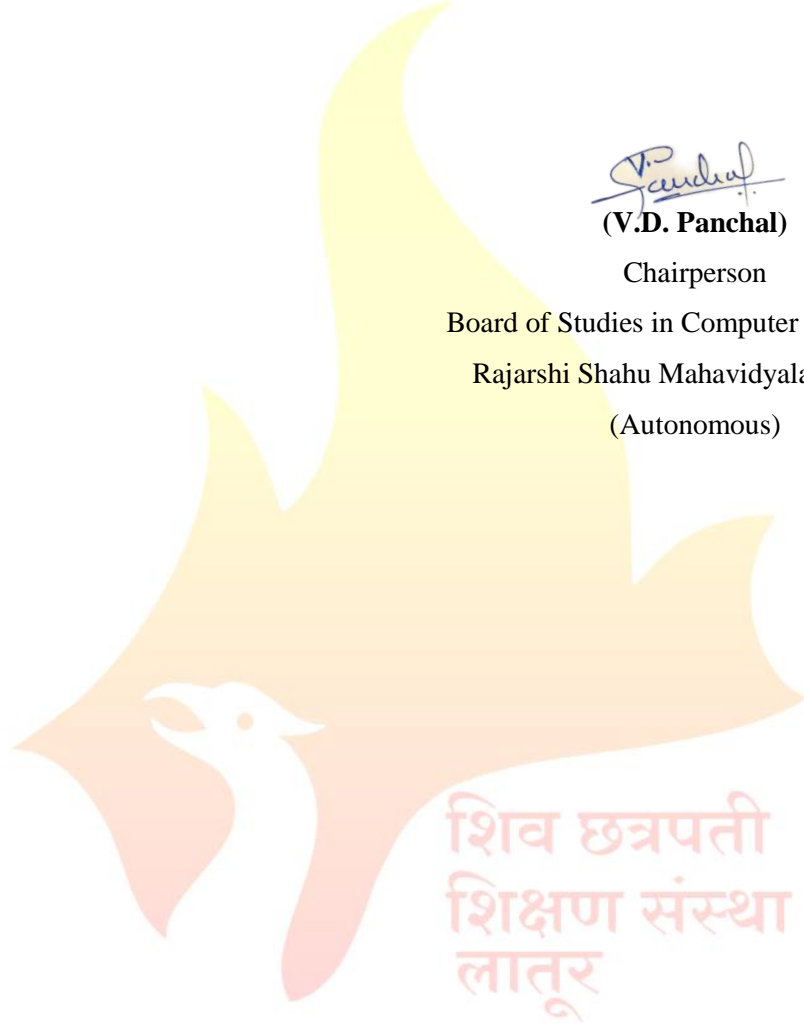
Date: 14/07/2023

Place: Latur

  
(V.D. Panchal)

Chairperson

Board of Studies in Computer Application  
Rajarshi Shahu Mahavidyalaya, Latur  
(Autonomous)



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



**Shiv Chhatrapati Shikshan Sanstha's  
Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

**Members of Board of Studies in the Subject Computer Application  
Under the Faculty of Science and Technology**

Sr. No.	Name	Designation	In position
1	<b>Mr. Vishwanath D Panchal</b> Head, Department of Information Technology, Rajarshi Shahu Mahavidyalaya (Autonomous), Latur	Chairperson	Coordinator
2	<b>Dr. Nilesh Deshmukh</b> Asso. Professor, School of Computational Science, SRTM, University, Nanded	Member	V.C. Nominee
3	<b>Dr. Ranjit Patil</b> Head, Dept. of Computer Science, Dr. D. Y. Patil, A.C.S. College, Pimpri, Pune.	Member	Academic Council Nominee
4	<b>Dr. Smita Bhanap</b> Asst. Professor, Department of Computer Science, Fergusson College (Autonomous), Pune.	Member	Academic Council Nominee
5	<b>Mr. Shashikant Swami</b> Head, Department of BCA, DCC, Latur	Member	Expert from outside for Special Course
6	<b>Mr. Sudhakar Gavhane</b> Senior Consultant with HSBC India Pvt. Ltd Pune	Member	Expert from Industry
7	<b>Mr. Sandeep Parandekar</b> Architects, Cognizant Technology Solution, Pune	Member	Alumni
8	<b>Dr. Upkar Varshney</b> Asso. Professor, Department of CIS Georgia State University Atlanta	Member	Invitee
9	<b>Mr. Shaikh R. S. S.</b>	Member	Faculty Member
10	<b>Mrs. Chandraprabha Kulkarni</b>	Member	Faculty Member
11	<b>Mrs. Manjusha Shinde</b>	Member	Faculty Member
12	<b>Mrs. Chetna Ahale</b>	Member	Faculty Member
13	<b>Mr. Prashant Joshi</b>	Member	Faculty Member
14	<b>Mr. Manoj Birajdar</b>	Member	Faculty Member
15	<b>Dr. Dnyaneshwar Rathod</b>	Member	Member from same Faculty

## From the Desk of the Chairperson...

It is the great pleasure and honor that I share the syllabi for First Year of B.C.A (Degree) under NEP-2020 which will be implemented from the academic year 2023-24.

While framing the syllabus draft, the feedbacks received from stakeholders, the technological advancements and global industrial requirements are considered.

The department is dedicated to offering a helpful, welcoming, and demanding learning environment.

In general, it aspires to become a hub of excellence in education, producing knowledgeable workers who will contribute to the nation's growth sustainably and improve people's lives through technology.

Our goal is to help the students become globally competent by strengthening their problem-solving abilities and exposing them to the newest advancements in the field of computer applications and information technology.

The Bachelor of Computer Applications (BCA) is made available through the Department of Information Technology. The programme is made to give new students the basic and advanced knowledge of computer and its applications that are required by business and academia to address current issues.

The department has a team of passionate academic staff with sound technical support staff. The faculty members of Department have very teaching experience and are sound knowledge in their respective areas.

I acknowledge with gratitude all the guidance given by our Principal, Dr. Mahadev Gavhane and Vice Principal Prof. Sadashiv Shinde during the course of framing the syllabus under NEP-2020.

I also acknowledge with gratitude all the members of the Board of Studies for their valuable suggestions and contributions in designing all the courses of first year of this programme.

I am sincerely appreciated to all who are involved in the process of syllabus designing.

Thank you.

(Mr. Vishwanath D Panchal)

Chairperson

Board of Studies in Computer Application

॥ आरोग्यं तमसो ज्योतिर्गते ॥  
Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

**Index**

Sr. No.	Content	Page No.
1	Structure for Four Year Multidisciplinary UG Programme	1
2	Abbreviations	2
3	Courses and Credits	3
4	UG Program Outcomes	4
5	Curriculum: Semester - I	5
6	DSC I : Problem Solving Through C	6
7	Lab Course –I (Based on DSC-I)	9
8	DSC II : Understanding Computers	11
9	Lab Course –II (Based on DSC-II)	14
10	VSC-I : Digital Logic	16
11	Curriculum: Semester – II	19
12	DSC-III : Object Oriented Programming Through C++	20
13	Lab Course –III (Based on DSC-III)	23
14	DSC-IV: Internet Programming	25
15	Lab Course –IV (Based on DSC-IV)	28
16	VSC-II : Basics of Statistics in Computer Application	30
17	Basket I: Generic/Open Elective (GE/OE)	33
18	Basket II: Skill Enhancement Courses (SEC)	34
19	Basket III: Ability Enhancement Courses (AEC)	35
20	Extra Credit Activities	36
21	Examination Framework	38

॥ आरोग्यं तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



**Shiv Chhatrapati Shikshan Sanstha's  
Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

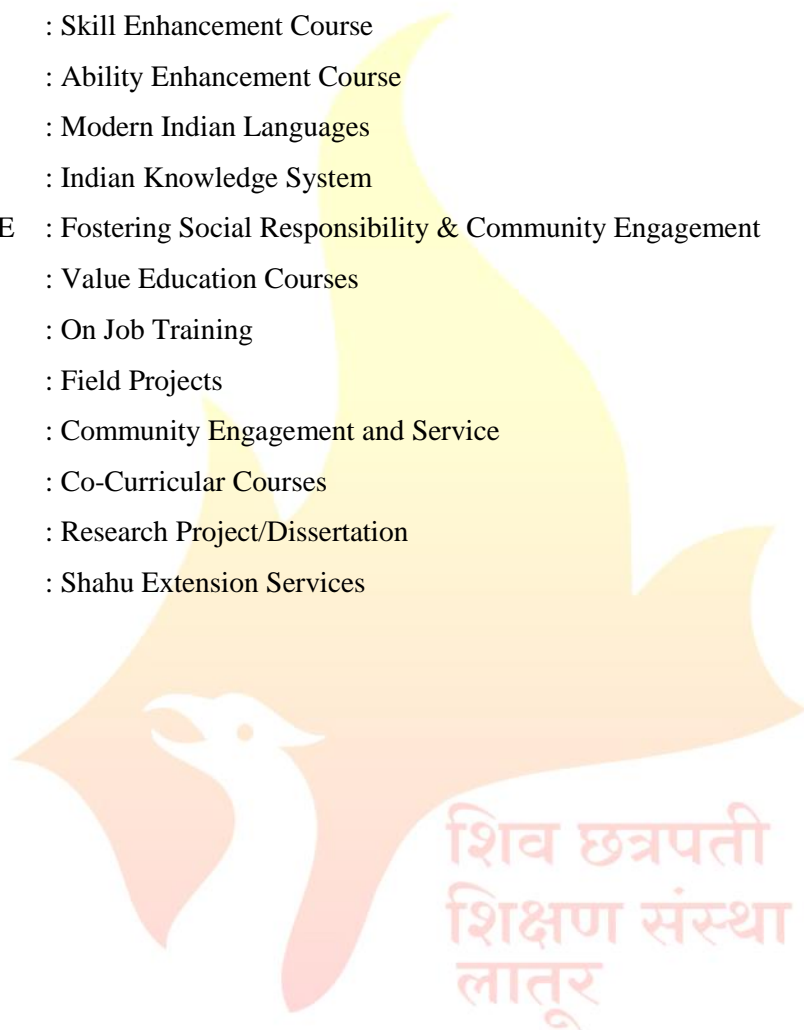
**Faculty of Science and Technology**

**Structure for Four Year Multidisciplinary Undergraduate Degree Programme in Computer  
Application Multiple Entry and Exit (In accordance with NEP-2020)**

Year & Level	Sem	Major		Minor	GE/OE	VSC/ SEC (VSEC)	AEC/ VEC	OJT,FP,CEP, RP	Credit per Sem.	Cum./Cr. per exit
		DSC	DSE							
1	2	3		4	5	6	7	8	9	10
I 4.5	I	DSC I: 04 Cr. DSC II: 04 Cr.	NA	NA	GE-I: 04 Cr.	VSC-I: 02 Cr. SEC-I: 02 Cr.	AEC-I MIL: 02 Cr. VEC-I: 02 Cr.	CC-I: 02 Cr. (NSS, NCC, Sports, Cultural)/ CEP-I: 02 Cr. (SES-I)/ OJT: 02 Cr. / Mini Project: 02 Cr.	22	44 Cr. UG Certificate
	II	DSCIII: 04 Cr. DSC IV: 04 Cr.	NA	NA	GE-II: 04 Cr.	VSC-II: 02 Cr. SEC-II: 02 Cr.	AEC- II MIL: 02 Cr. VEC- II: 02 Cr.	Generic IKS: 02 Cr.	22	
	Cum. Cr.	16	-	-	08	04+04= 08	04+02 +02=0 8	04	44	
Exit Option: Award of UG Certificate in Major with 44 Credits and Additional 04 Credits Core NSQF Course/Internship or continue with Major and Minor										

### Abbreviations:

1. DSC : Discipline Specific Core (Major)
2. DSE : Discipline Specific Elective (Major)
3. DSM : Discipline Specific Minor
4. GE/OE : Generic/Open Elective
5. VSEC : Vocational Skill and Skill Enhancement Course
6. VSC : Vocational Skill Courses
7. SEC : Skill Enhancement Course
8. AEC : Ability Enhancement Course
9. MIL : Modern Indian Languages
10. IKS : Indian Knowledge System
11. FSRCE : Fostering Social Responsibility & Community Engagement
12. VEC : Value Education Courses
13. OJT : On Job Training
14. FP : Field Projects
15. CEP : Community Engagement and Service
16. CC : Co-Curricular Courses
17. RP : Research Project/Dissertation
18. SES : Shahu Extension Services



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



**Shiv Chhatrapati Shikshan Sanstha's**  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

**Department of Information Technology**

**B.Sc. (Degree) Computer Application**

Year & Level	Semester	Course Code	Course Title	Credits	No. of Hrs.
I 4.5	I	101COA1101 (DSC-I)	Problem Solving Through C	03	45
		101COA1103	Lab Course-I	01	30
		101COA1102 (DSC-II)	Understanding Computers	03	45
		101COA1104	Lab Course-II	01	30
		GE-I	From Basket	04	60
		101COA1501 (VSC-I)	Digital Logic	02	45
		(SEC-I)	From Basket	02	30
		(AEC-I)	From Basket	02	30
		(VEC-I)	Constitution of India	02	30
		AIPC/OJT-I	Case Study	02	60
	Total Credits			22	
	II	101COA2101 (DSC-III)	Object Oriented Programming Through C++	03	45
		101COA2103	Lab Course-III	01	30
		101COA2102 (DSC-IV)	Internet Programming	03	45
		101COA2104	Lab Course-IV	01	30
		GE-II	From Basket	04	60
		101COA2501 (VSC-II)	Basics of Statistics in Computer Application	02	45
		(SEC-II)	From Basket	02	30
		(AEC-II)	From Basket	02	30
		(VEC-II)	FSRCE (CBPR)	02	30
		Generic IKS	Introduction to Indian Knowledge System	02	60
	Total Credits			22	
Total Credits (Semester I & II)				44	



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

**Faculty of Science & Technology**

Programme Outcomes (POs) for B.Sc. Programme	
PO No.	After completion of this programme the students will be able to-
PO 1	An ability to communicate effectively by oral, written, computing and graphical skills and presentation.
PO 2	An ability to enhance the application of knowledge of theory subjects in diverse fields.
PO 3	Preparing students in various disciplines of technologies such as computer applications, computer networking, software engineering, Web Technologies, JAVA, database concepts and programming
PO 4	Enhances programming skills of the young IT professionals through project development in each language/technology learnt during the programme
PO 5	To enhance logical ability and programming concepts by implementing programming lab
PO 6	Preparing students for future aspects by building and improving their creativity, social awareness, and general knowledge
PO 7	Ability to identify, formulate, analyse and solve problems of programming using different languages.
PO 8	Encouraging students to convert their start-up idea to reality by implementing it to become a software entrepreneur.
PO 9	An ability to communicate effectively by oral, written, computing and graphical skills and presentation.

॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)

# Semester - I



शिव छत्रपती  
शिक्षण संस्था  
लातूर

॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: DSC-I**

**Course Title: Problem Solving Through C**

**Course Code: 101COA1101**

**Credits: 03**

**Max. Marks: 75**

**Lectures: 45 Hrs.**

**Learning Objectives:**

- LO 1. To get knowledge about algorithm/flowchart to find solution on an problem
- LO 2. To writing C programs with branching and looping statements, which uses Arithmetic, Logical, Relational operators
- LO 3. To work with arrays, structure or union for storing the data
- LO 4. To understand modularity while written programs in C.
- LO 5. To use pointers in various concepts like arrays, structures and functions

**Course Outcomes:**

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

- CO 1. Analyze a computational problem and develop an algorithm/flowchart to find its solution
- CO 2. Develop readable C programs with branching and looping statements, which uses Arithmetic, Logical, Relational operators
- CO 3. Design readable C programs with arrays, structure or union for storing the data to be processed
- CO 4. Apply concepts of modules / functions in the C programme
- CO 5. Develop applications in C Language which will make use of pointers for array, functions, structures etc.

Unit No.	Title of Unit & Contents	Hrs.
I	Basics of C Language	8
	<b>1. Overview of C:</b> Introduction to Flowchart and algorithm, Importance of C, Sample 'C' programs, Basic structure of C programming, Executing a 'C' program,	
	<b>2. Data Types in C:</b> C tokens, Keywords, Identifiers, Constants, Variables, Data types, Declaration of variables, Assigning values to	

Unit No.	Title of Unit & Contents	Hrs.
	<p>variables, Defining symbolic constants, Simple Programs</p> <p><b>3. Input and Output statements:</b> Input and Output statements, Reading character, Writing character, formatted input, formatted output statements.</p> <p><b>Unit Outcomes:</b></p> <p>UO 1. Design flowchart/ algorithm for given problem</p> <p>UO 2. Develop simple programmes using input and output statements.</p>	
<b>II</b>	<b>Operators, Expressions and Programming Constructs</b>	<b>15</b>
	<p><b>1. Operators and Expressions:</b> Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operators, Bitwise operators, Special operators, Type Conversion in expressions, Operator precedence,</p> <p><b>2. Library Functions:</b> Mathematical functions</p> <p><b>3. Branching and Looping:</b> Simple 'if' statement, Simple, Nested, Ladder 'if-else' statement. The 'Switch' statement, break, continue, goto, exit statement, 'While' statement, 'do-while' statement, 'for' statement, Simple programs on branching and looping, Nesting of loop.</p> <p><b>Unit Outcome:</b></p> <p>UO 1. Develop C programs which uses Arithmetic, Logical, Relational operators</p> <p>UO 2. Design and develop programmes with branching and looping statements</p>	
<b>III</b>	<b>Arrays and String Handling</b>	<b>10</b>
	<p><b>1. Arrays:</b> Introduction, One dimensional, Two dimensional and Multidimensional arrays, Initialization of arrays,</p> <p><b>2. Handling of Character Strings:</b> Declaring and Initializing string variables, reading string from terminal, writing string to screen, Arithmetic operations on characters, Comparison of two strings,</p> <p><b>3. String handling functions:</b> String functions &amp; string.h file.</p> <p><b>Unit Outcomes:</b></p> <p>UO 1. Apply the concepts of arrays to implement concepts of data structure</p>	

Unit No.	Title of Unit & Contents	Hrs.
	UO 2. Efficiently implement string functions during the application	
<b>IV</b>	<b>Pointers, Structure and Functions</b>	<b>12</b>
	<ol style="list-style-type: none"> <li><b>Pointers:</b> Understanding Pointers, Accessing the address of variables, Declaring and initializing pointers, Accessing a variable through its pointers.</li> <li><b>Structure and Union:</b> Introduction, Defining Structure, declaring structure variables and structure members, arrays as structure, arrays within structure, Union.</li> <li><b>Functions:</b> Definition of function. Return values and their types, Function calls, Function declaration, Categories of function explanation with example, Nesting of function, Recursion, Command line argument</li> </ol>	
	<b>Unit Outcomes:</b> UO 1. Able to develop applications which will make use of pointers for array UO 2. Develop programme / application by using functions, structures etc.	

#### Learning Resources:

1. Programming in ANSI C, E. Balgurusamy, Tata McGraw Hill
2. Let us C, Yashwant Kanitkar, BPB Publication
3. Programming in C, V. Rajaraman, PHI Publication
4. The C Programming Language, Kernighan & Ritchie, PHI Publication
5. Programming in C, P.B. Kottur, Sapna Book House
6. Programming with ANSI and TURBO C, Kamthane, Pearson Education
7. <https://www.w3schools.com/c/>
8. <https://www.tutorialspoint.com/cprogramming/index.htm>
9. <https://www.programiz.com/c-programming>

॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: Lab Course**

**Course Title: Lab Course –I (Problem Solving Through C)**

**Course Code: 101COA1103**

**Credits: 01**

**Max. Marks: 50**

**Hours: 30**

**Learning Objectives**

- LO 1. Understand the basic fundamentals and structure of C programming
- LO 2. Study various data types, arrays and functions in C
- LO 3. Understand input-output and, control and iterative statements in C
- LO 4. Develop the skills of C Programming
- LO 5. Improve the logical thinking skills

**Course outcomes**

After completion of course the student will be able to-

- CO 1. Write programs using appropriate data types and control structures in C
- CO 2. Make a detailed study of the different decision-making structures and loop control structures
- CO 3. Understand and analyze various problem-solving methods
- CO 4. Develop programs using concept of Arrays, Structures, pointers and functions

Practical No.	Unit
1	Write a C program to find the area of a circle. Accept radius from user
2	Develop C program to convert temperature in Fahrenheit to Celsius and Celsius to Fahrenheit
3	Write a C program to find the area of a rectangle. Input length and breadth from user
4	Write a C program to find the common division of two integer numbers
5	Write a C program to check whether the number is even or odd
6	Prepare a C program to read any three integers and display smallest among them using if statement
7	Develop a simple calculator with addition, subtraction, multiplication, division

	using switch case in C.
8	Write a C program to print number from 1 to 100 which are divisible by 5 and display their sum and count using for loop
9	Write a C program to check whether given number is palindrome or not using loop
10	Write a C program the pattern given below using nested for loop 1 12 123 1234 12345
11	Write a C program to read integers into an array and find sum of all numbers.
12	Handle any five string functions using C programe
13	Create an application to make use of pointers
14	Write a programe to make use of structure in C
15	Write a C program to make use of user define function

N.B.: Any Ten Practical from above.



॥ आरोह तमसो ज्योतिः॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: DSC-II**

**Course Title: Understanding Computers**

**Course Code: 101COA1102**

**Credits: 03**

**Max. Marks: 75**

**Lectures: 45 Hrs.**

---

**Learning Objectives**

- LO 1. Fundamental computational concepts underlying most programming languages
- LO 2. Attitudes and working practices appropriate for a professional programmer and skills supporting the solution of small problems.
- LO 3. Independent and self-motivated study in Computing Science
- LO 4. Identification of various types of computer parts
- LO 5. Work with various types of operating systems

**Course Outcomes:**

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

- CO 1. Identify the parts of the computer system
- CO 2. Efficiently handle conversation logic of number system
- CO 3. Adequately explain functioning of computer components
- CO 4. Explain the process of problem solving using computer
- CO 5. Identify the software types and operating system types and efficiently work with Windows, Linux Operating System

Unit No.	Title of Unit & Contents	Hrs.
I	<b>Computer System &amp; Data Representation within Computer</b>	<b>12</b>
	<b>1. Introduction to Computer System</b> 1.1. Introduction 1.2. Basic structure, ALU memory, CPU, I/O devices 1.3. Generations of computer 1.4. Evolution of computer 1.5. Classification of computers: Note book computers, personal	

Unit No.	Title of Unit & Contents	Hrs.
	<p>computers, workstation, micro, mini ,mainframe, supercomputer</p> <p><b>2. Data Representation within Computer</b></p> <p>2.1. Bit, Byte, Word</p> <p>2.2. ASCII, EBCDIC, BCD code</p> <p>2.3. Introduction to number system: Decimal, Binary, Octal, Hexadecimal</p> <p><b>Unit Outcome:</b></p> <p>UO 1. Identify the parts and types of computers</p> <p>UO 2. Efficiently handle conversation logic of number system</p>	
<b>II</b>	<b>Input Output Devices &amp; Memory</b>	<b>12</b>
	<p><b>1. Input Output Devices</b></p> <p>1.1. Input Devices: Keyboard, Point &amp; Draw Devices, Data Scanning devices, Digitizer, Electronic Card Reader, Voice Recognition devices</p> <p>1.2. Output Devices: Monitor, Printer, Plotter, Screen Image projector, voice response system.</p> <p><b>2. Memory</b></p> <p>2.1. RAM, ROM, PROM, EPROM, EEPROM</p> <p>2.2. Base Memory, Extended memory, expanded memory, cache memory</p> <p>2.3. Storage devices: Tape, FDD, HDD, CDROM</p> <p><b>Unit Outcome:</b></p> <p>UO 1. Identify and work with various types of IO devices</p> <p>UO 2. Abel to differentiate memory / storage of computers</p>	
<b>III</b>	<b>Computer Software &amp; Introduction to Operating System</b>	<b>10</b>
	<p><b>1. Computer Software</b></p> <p>1.1. Definition of software</p> <p>1.2. Types of software</p> <p>1.3. Compilers, Interpreters, Assemblers, Linkers, Loaders</p> <p><b>2. Introduction to Operating System</b></p> <p>2.1. Introduction</p> <p>2.2. Main function of operating system</p>	

Unit No.	Title of Unit & Contents	Hrs.
	2.3. Files and directories 2.4. Types of OS	
	<b>Unit Outcomes:</b> UO 1. Identify the software types and operating system types	
<b>IV</b>	<b>Study of Operating systems</b>	<b>11</b>
	<b>1. Study of Operating systems</b> 1.1. Introduction to DOS 1.2. File and directory structure under DOS 1.3. Introduction to WINDOWS and Study Windows O.S. 1.4. Introduction to LINUX <b>2. Introduction to Office Applications</b> 2.1 Introduction to Word Processor Application 2.2 Introduction to Spread Sheet Solution Application 2.3 Introduction to Presentation Application	
	<b>Unit Outcome:</b> UO 1. Work with Windows, Linux and DOS operating system	

### Learning Resources:

1. Fundamentals of Computer Science, P.K. Sinha, BPB Publication, Sixth Edition, 2017
2. Fundamentals of Computer Science, V.Rajaraman, PHI Learning Pvt. Ltd., 2015
3. Fundamentals of Computers, E Balagurusamy, Mc Graw Hill
4. Fundamentals of Computers and Information System by Niranjana Shrivastava, Wiley India, 2013
5. Computer Fundamentals, Anita Goel, Pearson Education, 2010
6. Fundamentals of Computers, Reema Thareja, Oxford, 2014
7. Fundamentals of Information Technology, Chetan Srivastava, Kalyani Publishers, Third edition, 2010
8. Introduction to Computers, Peter Norton, Tata McGraw Hill, 1995



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: Lab Course**

**Course Title: Lab Course –II (Understanding Computers)**

**Course Code: 101COA1104**

**Credits: 01**

**Max. Marks: 50**

**Hours: 30**

**Learning Objectives**

- LO 1. Fundamental computational concepts underlying most programming languages
- LO 2. Attitudes and working practices appropriate for a professional programmer and skills supporting the solution of small problems.
- LO 3. Independent and self-motivated study in Computing Science
- LO 4. Identification of various types of computer parts
- LO 5. Work with various types of operating systems

**Course Outcomes:**

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

- CO 1. Efficiently handle conversation logic of number system
- CO 2. Detect and identify the booting procedure of DoS
- CO 3. Work with Input and Output devices
- CO 4. Create Files and Folders and arrange them
- CO 5. Efficiently handle shortcut keys for cut, copy, paste and other windows application keys

Practical No.	Unit
1	Study of BOOTING Procedure of O.S
2	Study of classification of computer
3	Study of Input Devices
4	Study of Output Devices
5	Study of MS-DOS Internal Commands
6	Study of MS-DOS External Commands
7	Study of Directory related Commands
8	Identification and study of Storage Devices
9	Study of windows O.S. <ul style="list-style-type: none"><li>i) Desktop</li><li>ii) Control Panel</li></ul>

	iii) Icon iv) Taskbar
10	Moving, Coping file, and folder from one location to another under DOS and Windows
11	Installing Printers, and other hardware devices
12	Case study of Windows and Linux O.S

N.B.: Any Ten Practical from above.



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: VSC-I**

**Course Title: Digital Logic**

**Course Code: 101COA1501**

**Credits: 02**

**Max. Marks: 50**

**Lectures: 30 Hrs.**

**Learning Objectives:**

- LO 1. Describe the various concepts of digital electronics
- LO 2. Understand working of basic and universal gates,
- LO 3. Understand different number systems and conversion between them
- LO 4. Understand the working Boolean algebra and multiplexer
- LO 5. Understand the working of flipflop
- LO 6. Identify basic structure of Microprocessor

**Course Outcomes:**

After completion of course the student will be able to-

- CO 1. Convert different type of number systems which are used in digital communication and computer systems
- CO 2. Identify different types of logic families which are the basic unit of different types of logic gates
- CO 3. Identify and describe introduction to digital concepts
- CO 4. Apply the logic in different programming logic building
- CO 5. Identify microprocessor and components of it.

Unit No.	Title of Unit & Contents	Hrs.
I	Number System	06
	<ul style="list-style-type: none"><li>1. Number system: Binary number system, decimal number system, octal number system, hexadecimal number system.</li><li>2. Bases inter conversions</li><li>3. Binary Subtraction using 1's and 2's complement method</li></ul>	
	<b>Unit Outcomes:</b> <ul style="list-style-type: none"><li>UO 1. Efficiently handle conversion of number from one system to another</li><li>UO 2. Handle 1's and 2's complement</li></ul>	

<b>II</b>	<b>Basic and Universal Gate</b>	<b>11</b>
	<ol style="list-style-type: none"> <li>1. Boolean algebra: Fundamental concepts of Boolean algebra, Symbol, Boolean equation</li> <li>2. Basic Gates: Truth tables of different types of gate NOT gate, AND gate, OR gate, NAND gate, NOR gate, X-OR gate, X-NOR gate,</li> <li>3. Basic laws of Boolean algebra and simplification of Boolean</li> <li>4. Universal property of NAND and NOR gate</li> </ol>	
	<b>Unit Outcomes:</b> UO 1. Identify the basic building block gates UO 2. Work with Boolean algebra	
<b>III</b>	<b>Adder, Mux and De-Mux</b>	<b>07</b>
	<ol style="list-style-type: none"> <li>1. <b>Combinational logic circuit:</b> Half adder and FULL adder, parallel binary adders, HALF subtractor and FULL subtractor</li> <li>2. <b>Mux and Demux:</b> Multiplexer and demultiplexer with types &amp; examples, Encoder and decoder with types</li> </ol>	
	<b>Unit Outcome:</b> UO 1. Able to work with half adder, subtractor and encoder	
<b>IV</b>	<b>Study of Flip flop</b>	<b>06</b>
	<ol style="list-style-type: none"> <li>1. <b>Sequential logic circuit:</b> Flip-flop-latches, edge triggered and level triggered</li> <li>2. <b>Flip flop with types:</b> SR flip flop, D flip flop, JK flip flop and T flip-flop</li> <li>3. <b>Introduction to Microprocessors:</b> Basic components of microprocessors.</li> </ol>	
	<b>Unit Outcomes:</b> UO 1. Efficiently handle sequential logic circuit UO 2. Identify the components of microprocessors	
<b>V</b>	<b>Practicals (Included in above 04 units)</b>	
	<ol style="list-style-type: none"> <li>1. To perform and verify the truth tables of basic gates</li> <li>2. To perform and verify the truth tables of derived gates</li> <li>3. To perform and verify the truth tables of EX-OR and EX-NOR gate</li> <li>4. Verify the universal property of NAND gate and NOR gate</li> <li>5. Implement and verify the truth table of any two Boolean equation</li> <li>6. Verify the truth table of half adder and Full adder</li> <li>7. To perform and verify the truth table of multiplexer</li> <li>8. Microprocessor block diagram and identification</li> </ol>	

### Learning Resources:

1. Digital Computer Fundamentals, Floyd, Thomas L, 3 rd Edition 1997.
2. Digital Computer Fundamentals, Malvino, Paul Albert and Leach, Donald P, 3rd Edition, 1995. TMH.
3. Modern Digital Electronics, R. P. Jain, 3rd Edition, Tata Mc Graw Hill, 2003.
4. Computer Organization and Architecture, William Stallings, Pearson Education 2003
5. Computer systems design and architecture, Heuring and Jordan , Pearson Education
6. Digital Computer Fundamentals, Bartee, Thomas C, 6 th Edition, 1995, TMH
7. Digital Electronics, Bignell and Donovan, 5th Edition, Thomson Publication, 2007



॥ आरोह तमसो ज्योतिः॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



# Semester - II

शिव छत्रपती  
शिक्षण संस्था  
लातूर

॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

Course Type: DSC -III

Course Title: Object Oriented Programming Through C++

Course Code: 101COA2101

Credits: 03

Max. Marks: 75

Hours: 45

**Learning Objectives:**

- LO 1. Describe the object-oriented programming approach in connection with C++
- LO 2. Understand Object oriented concepts like data abstraction, encapsulation, etc.
- LO 3. Understand concepts like inheritance, virtual function
- LO 4. Understand the difference between the top-down and bottom-up approach
- LO 5. Solve the real-world scenarios using top-down approach

**Course Outcomes:**

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

- CO 1. Identify importance of object-oriented programming and difference between structured oriented and object-oriented programming features
- CO 2. Solve computational problems using basic constructs, functions.
- CO 3. Make use of objects and classes for developing programs.
- CO 4. Implement relationships between classes.
- CO 5. Use various object-oriented concepts to solve different problems.

Unit No.	Title of Unit & Contents	Hrs.
I	Basics of OOPs and C++	12
	<ul style="list-style-type: none"><li>1. <b>Introduction:</b> Object Oriented Paradigm</li><li>2. <b>Basic concepts of OOP:</b> Object, Class, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Overloading, Dynamic binding, Message Passing.</li><li>3. <b>C++ Features:</b> The iostream class, C++ comments, C++ keywords, variable declaration,</li><li>4. <b>Manipulators:</b> endl, setw, setprecision, Scope resolution operator, new and delete operators.</li><li>5. <b>Functions:</b> function declaration, calling the function, function definition, passing argument to, returning value from function, pass by value, pass by reference, default arguments, overloaded functions,</li></ul>	

Unit No.	Title of Unit & Contents	Hrs.
	inline functions	
	<b>Unit Outcomes:</b> UO 1. Understand basic concepts of OOPs UO 2. Able to write logic using functions	
<b>II</b>	<b>Classes and Object</b>	<b>13</b>
	<ol style="list-style-type: none"> <li><b>Classes &amp; objects:</b> class declaration, class members,</li> <li><b>Class member visibility:</b> private, public, protected.</li> <li><b>Constructor and destructor:</b> Default constructor, constructor with argument, constructor with default arguments, copy constructor,</li> <li><b>Member Function:</b> Defined outside the class, objects as arguments, returning objects from functions, manipulating private data members, Array of objects</li> </ol>	
	<b>Unit Outcome:</b> UO 1. Implement concept of Class and object UO 2. Understand implementation of constructors, members functions	
<b>III</b>	<b>Overloading and Type Conversion</b>	<b>08</b>
	<ol style="list-style-type: none"> <li><b>Operator Overloading:</b> Defining operator overloading, overloading unary operator, overloading binary operator</li> <li><b>Data conversion:</b> conversion between basic to class types, conversion between objects and basic types</li> </ol>	
	<b>Unit Outcomes:</b> UO 1. Define new meaning to operators using overloading	
<b>IV</b>	<b>Inheritance and Virtual Function</b>	<b>12</b>
	<ol style="list-style-type: none"> <li><b>Inheritance:</b> Derived class &amp; Base class: Specifying the derived class, accessing the base class members, derived class constructor, overriding member functions, public &amp; private inheritance.</li> <li><b>Level of inheritance:</b> Simple / Single inheritance, Multilevel inheritance, multiple inheritance, hybrid inheritance, Hierarchical inheritance, Hybrid Inheritance, constructors in inheritance.</li> <li><b>Virtual Functions:</b> Introduction, Normal member function accessed with pointers, virtual member function accessed with pointers, this pointer</li> </ol>	
	<b>Unit Outcomes:</b> UO 1. Implement various concepts of inheritance to solve real life problems.	

Unit No.	Title of Unit & Contents	Hrs.
	UO 2. Understand use of virtual functions	

### Learning Resources

1. Object Oriented Programming with C++, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill
2. Complete Reference C++, Herbert Schildt, Tata McGraw Hill
3. Object Oriented Programming in Turbo C++, Robert Lafore, Fourth Edition Galgotia Publications.
4. The C++ Programming Language, Bjarne Stroustrup, Third Edition, Addison-Wesley Publishing Company
5. The C++ Programming Language (4th Edition), Bjarne Stroustrup
6. C++ Primer', Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo
7. <https://notalentgeek.github.io/note/note/project/project-independent/pi-brp-beginning-c-programming/document/20170807-1504-cet-1-book-and-source-1.pdf>
8. [https://www.w3schools.com/cpp/cpp\\_intro.asp](https://www.w3schools.com/cpp/cpp_intro.asp)
9. <https://www.javatpoint.com/cpp-tutorial>



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: DSC-III**

**Course Title: Lab Course (Object Oriented Programming Through C++)**

**Course Code: 101COA2103**

**Credits: 01**

**Max. Marks: 50**

**Hours: 15**

**Learning Objectives:**

1. Describe the object-oriented programming approach in connection with C++
2. Understand Object oriented concepts like data abstraction, encapsulation, inheritance, virtual function, etc.
3. Understand the difference between the top-down and bottom-up approach
4. Solve the real-world scenarios using top-down approach

**Course Outcomes:**

1. Solve computational problems using basic constructs like if-else, control structures, array.
2. Identify importance of object-oriented programming and difference between structured oriented and object-oriented programming features.
3. Make use of objects and classes for developing programs.
4. Use various object-oriented concepts to solve different problems

Practical No.	Unit
1	Program to demonstrate I/O statements and manipulators
2	Program for scope resolution operator
3	Write a program using area() function that returns the area of a circle with given radius. float area(float r)
4	Write a program using min() function that returns the smallest of two integers int min(int x, int y)
5	Program to demonstrate simple concept of class and object concept
6	Program to demonstrate visibility modes used in class
7	Program to demonstrate constructor and its types
8	Program to demonstrate destructor
9	Program to find area and circumference of rectangle and triangle using function overloading
10	Program to demonstrate operator overloading concept

11	Program to demonstrate concept of single inheritance
12	Program to demonstrate concept of multiple inheritance
13	Program to demonstrate virtual function

N.B.: Any Ten Practical from above.



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: DSC -IV**

**Course Title: Internet Programming**

**Course Code: 101COA2102**

**Credits: 03**

**Max. Marks: 75**

**Hours: 45**

**Learning Objectives:**

- LO 1. Get knowledge about Web site and web page
- LO 2. Understand HTML programs with basic formatting tags
- LO 3. Work table, frame and form creation
- LO 4. Understand linking with pages
- LO 5. Make use of formatting scripting like CSS

**Course Outcomes:**

After completion of course the student will be able to-

- CO 1. Define and apply the standards used for web page design
- CO 2. Design webpage using the elements of HTML.
- CO 3. Create Webform for accepting user inputs.
- CO 4. Build dynamic webpages using techniques with CSS.
- CO 5. Use Client side scripting language for formatting webpages.

Unit No.	Title of Unit & Contents	Hrs.
<b>I</b>	<b>Basics of Web Design</b>	<b>6</b>
	<b>1.</b> Basics in Web Design, Brief History of Internet, What is World Wide Web, Why create a web site, Web Standards, Five Golden rules of web designing	
	<b>2.</b> Basic structure of HTML Programme and Tags	
	<b>Unit Outcomes:</b> UO 1. Understand History of Internet UO 2. Understand Structure of HTML programme	
<b>II</b>	<b>Introduction to HTML and Tags</b>	<b>13</b>
	<b>1. HTML Markup tags:</b> Tags-Definition, Basic Tags-HTML, HEAD, TITLE, BODY. Paragraph Tags, List tags, Horizontal Rule Tag, Headings Tags, Block quote Tags, Address Tags, FONT Tag, PRE	

Unit No.	Title of Unit & Contents	Hrs.
	<p>tag, DIV tags</p> <p><b>2. Formatting Tag:</b> Text formatting tag, Para formatting, Alignments, etc.</p> <p><b>3. Linking in HTML:</b> U.R.L. concept, Hyperlink (Anchor) Tag and it's all attributes, Creating Email Hyperlinks (using mailto anchor).</p> <p><b>4. Use of Images:</b> Introduction, Image &amp; image formats, &lt;img&gt; tag and it's all attributes, Inline &amp; Floating Images, Using Images as links.</p> <p><b>Unit Outcome:</b></p> <p>UO 1. Develop HTML programs which uses HTML tags, formatting tags</p> <p>UO 2. Design web pages with hyperling and images</p>	
<b>III</b>	<b>Table, Frame and Form</b>	<b>16</b>
	<p><b>1. Tables in HTML:</b> Introduction, Table Tags:- TABLE, TR, TH, TD and all Attributes, Row span, Cols pan, Cell spacing, Cell padding, Table examples</p> <p><b>2. Frames in HTML:</b> Overview, FRAMESET &amp; FRAME tags and its attributes, Simple frame Examples, Use of tag, Frame targeting, Floating frames.</p> <p><b>3. Forms in HTML:</b> Introduction to forms, FORM tag and it's attributes (Action, Method, Name), Simple form examples,</p> <p><b>4. Form controls:</b> Text Field, Password Field, Multiline Text Area, DropDown List, Check Box, Radio Buttons, Scrolled List, Reset Button, Submit button.</p> <p><b>Unit Outcomes:</b></p> <p>UO 1. Apply the concepts of tables and frame</p> <p>UO 2. Efficiently implement html form for user input</p>	
<b>IV</b>	<b>Cascading Style Sheet</b>	<b>10</b>
	<p><b>1. Introduction:</b> Introduction to Cascading Style Sheets, Concept of CSS, Creating Style Sheet, CSS Properties</p> <p><b>2. Creating using styling:</b> CSS Styling(Background, Text Format, Controlling Fonts), Working with block elements and objects</p> <p><b>3. Creating Class and ID:</b> Working with Lists and Tables, CSS Id and Class, CSS Color</p> <p><b>4. Linking a Style Sheet to an HTML Document:</b> Inline style and</p>	

Unit No.	Title of Unit & Contents	Hrs.
	External Style Sheet.	
	<b>Unit Outcomes:</b> UO 1. Able to develop webpages which will make use CSS	

### Learning Resources:

1. Web Publishing, Monica D' Souza, Jude D' Souza, TMH Publication)
2. The complete reference HTML & CSS, T.A. Powell, TMH Publication
3. HTML, DHTML, JavaScript, Perl CGI, IVAN Bayroos, BPB Publication
4. HTML 5 Black Book, by Kogent Learning Solutions Inc, Dreamtech Press
5. Head First HTML 5 programming, Eric Freeman, O'Reilly
6. HTML5 Step by Step, Faithe Wempen, Microsoft Press
7. Internet and Web Technologies ,Raj Kamal, McGraw Hill
8. <https://www.w3schools.com/html/>
9. <https://www.tutorialspoint.com/html/index.htm>
10. <https://www.javatpoint.com/html-tutorial>
11. <https://www.w3schools.com/css/>
12. <https://www.w3.org/Style/CSS/Overview.en.html>



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: Lab Course**

**Course Title: Lab Course –IV (Internet Programming)**

**Course Code: 101COA2104**

**Credits: 01**

**Max. Marks: 50**

**Hours: 30**

**Learning Objectives:**

- LO 1. Get knowledge about Web site and web page
- LO 2. Understand HTML programs with basic formatting tags
- LO 3. Work table, frame and form creation
- LO 4. Understand linking with pages
- LO 5. Make use of formatting scripting like CSS

**Course Outcomes:**

After completion of course the student will be able to-

- CO 1. Define and apply the standards used for web page design
- CO 2. Design webpage using the elements of HTML.
- CO 3. Create Webform for accepting user inputs.
- CO 4. Build dynamic webpages using techniques with CSS.
- CO 5. Use Client side scripting language for formatting webpages.

Practical No.	Unit
1	Develop and demonstrate a HTML document that illustrate <ul style="list-style-type: none"><li>i) Headings tags(H1,H2,H3,H4,H5,H6)</li><li>ii) Font Details (Font Size, Style, Type, Color)</li></ul>
2	Develop and demonstrate a HTML document that illustrate <font> tag with all attributes
3	Develop and demonstrate a HTML document that illustrates ordered list and unordered list
4	Design an web page that make use of formatting tags.
5	Create a page to show different character formatting (B, I, U, SUB, SUP) tags. viz : $\log_b m^p = p \log_b m$
6	Design an HTML page to make use of following

	i) Image as a background ii) Hyperlink using an image iii) Hyperlink with another web page(A, Base, Href)
7	Develop an HTML page that illustrates i) Table Alignment (Cell Spacing, Cell Padding ,Height ,Width, Border, Rowspan , colspan) ii) Setting Different Table Attributes(Color, Image)
8	Create a Web page having Main Frame along with three Sub Frames(Windows)
9	Create “Website Login Form” which consists of following details User Name , Password Address, Ph no, Sex, Hobbies, Date Of Birth ,Country , along with submit and Reset Button
10	Create a login form as above which will use the post method by sending data on another form.
11	Create a CSS document on Internal style sheet
12	Create a CSS document on External style sheet
13	Create a CSS document on In line style sheet

N.B.: Any Ten Practical from above.



॥ आरोह तमसो ज्योतिः॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

Department of Information Technology

**Course Type: VSC-II**

**Course Title: Basics of Statistics in Computer Application**

**Course Code: 101COA2501**

**Credits: 02**

**Max. Marks: 50**

**Hours: 30**

**Learning Objectives:**

- LO 1. Acquire a strong foundation in statistical analytics
- LO 2. Cultivate statistical thinking
- LO 3. Apply the fundamental principles, concepts and methods of statistics
- LO 4. Classify, tabulate and represent the data graphically

**Course Outcomes:**

After completion of course the student will be able to-

- CO 1. Explain descriptive statistics
- CO 2. Analyze data and apply measures of central tendency on data
- CO 3. Apply fundamental techniques of data representation on data
- CO 4. Apply knowledge of statistics in career fields like Data Science

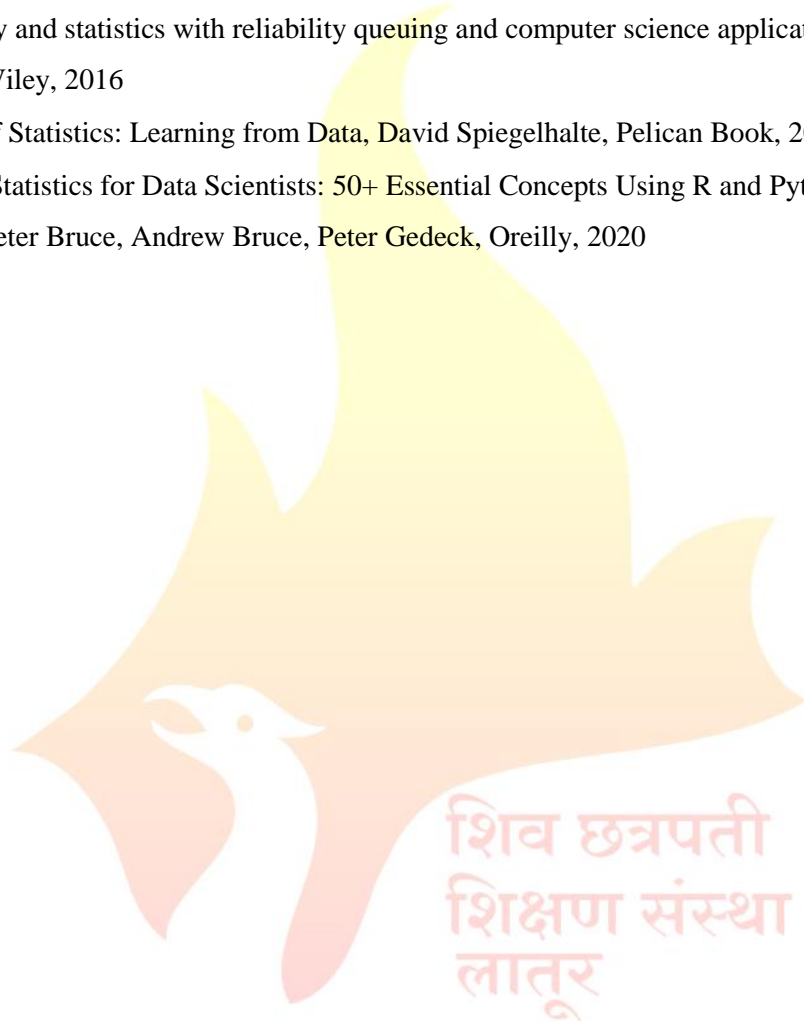
Unit No.	Title of Unit & Contents	Hrs.
I	<b>Statistics and Graphical Representation</b>	12
	<b>1. Introduction:</b> Definitions of Statistics, Importance of statistics, Collection of Data, Types of Data, Attributes and variables, Construction of Frequency, Cumulative Frequency Distribution <b>2. Graphical representation of frequency distribution:</b> Histogram, Frequency Polygon, Frequency Curve and Cumulative Frequency curves (Ogive curves), Diagrammatic representations: Simple bar, Subdivided bar, Pie diagrams <b>Unit Outcomes:</b> UO 1. To acquire a strong foundation in statistical analytics by applying techniques of data representation	
II	<b>Measures of Central Tendency</b>	10
	<b>1.</b> Concept of central tendency <b>2. Arithmetic Mean:</b> Definition, Formulae and computation for	

Unit No.	Title of Unit & Contents	Hrs.
	<p>ungrouped and grouped, data, Merits and Demerits</p> <p><b>3. Median:</b> Definition, Formulae and Computation for ungrouped and grouped data, Merits and Demerits</p> <p><b>4. Mode:</b> Definition, Formulae and Computation for ungrouped and grouped data, Merits and Demerits</p> <p><b>Unit Outcome:</b></p> <p>UO 1. Compute and interpret various measures of central tendency such as mean, median, mode etc.</p>	
<b>III</b>	<b>Measures of Dispersion</b>	<b>8</b>
	<p><b>1.</b> Concept of Dispersion</p> <p><b>2. Range:</b> Definition, Formulae and Computation for ungrouped and grouped data</p> <p><b>3. Standard Deviation:</b> Definition, Formulae and Computation for ungrouped and grouped data</p> <p><b>4. Variance:</b> Definition, Formulae and Computation for ungrouped and grouped data</p> <p><b>Unit Outcomes:</b></p> <p>UO 1. To compute and interpret various measures of dispersion</p>	
<b>IV</b>	<b>Practicals (Included in above 03 units)</b>	
	<p>1. Study of histogram: Construct histogram for given statistical data using MS-Excel</p> <p>2. Construct frequency polygon for given data using MS-Excel</p> <p>3. Draw frequency curve for given data using MS-Excel</p> <p>4. Draw and construct ogive for given statistical data using MS-Excel</p> <p>5. Construct simple bar diagram for given data using MS-Excel</p> <p>6. Draw subdivided bar diagram for given data using MS-Excel</p> <p>7. Draw pie diagram for given statistical data using MS-Excel</p> <p>8. Calculate various measures of central tendency (mean, median, mode) on given data using MS-Excel</p> <p>9. Calculate various measures of dispersion.</p>	

#### Learning Resources:

1. Statistical Methods by S.P. Gupta, Sultan Chand and Sons, 2021
2. Fundamentals of Statistics by A.M. Gun, M. K. Gupta and B. Dasgupta, World Press, 2016
3. Modern Elementary Statistics by J.E. Freund, Pearson Education, 2000

4. Fundamentals of Mathematical Statistics by S C. Gupta & V.K. Kapoor, Sultan Chand & Sons, 2000
5. Elements of Statistics 1: Descriptive Statistics And Probability / 1st, Edition, Stephen Bernstein, Ruth Bernstein, McGraw Hill, 2020
6. Business Mathematics and Statistics by R K Ghosh & S Saha, New Central Book Agency (p). Ltd, 2016
7. Fundamentals of Applied Statistics, S.C. Gupta, Sultan Chand and Sons, 2014
8. Probability and statistics with reliability queuing and computer science applications by K. S. Trivedi, Wiley, 2016
9. The Art of Statistics: Learning from Data, David Spiegelhalte, Pelican Book, 2020
10. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python, Second Edition, Peter Bruce, Andrew Bruce, Peter Gedeck, Oreilly, 2020



॥ आरोह तमसो ज्योतिः॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

UG First Year

**Basket I: Generic/Open Elective (GE/OE)**

(GEs offered to the Science & Technology students in Sem.-I and II)

Sr. No.	BoS Proposing GE/OE	Code	Course Title	Credits	Hrs.
1	Commerce	101AAF1401	Mutual Fund Management	04	60
2	Commerce	101MAE1401	Fundamentals of Statistics	04	60
3	English	101ENG1402	English for Science and Technology	04	60
4	Geography	101GEO1401	General Geography	04	60
5	Commerce	101BAI1401	Personal Financial Management	04	60
6	Marathi	101MAR1401	स्पर्धापरीक्षा आणि मराठी भाषा	04	60
7	Political Science	101POL1401	Human Rights	04	60
8	Biotechnology	101BIO1401	Nutrition, Health and Hygiene	04	60
9	Music	101MUS1401	Indian Vocal Classical & Light Music	04	60
10	NCC Studies	101NCC1401	Introduction to NCC	04	60
11	Sports	101SPO1401	Counseling and Psychotherapy	04	60

**Note: Student can choose any one GE from the basket.**

॥ आरोग्यं तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

UG First Year

**Basket II: Skill Enhancement Courses (SEC)**

(SEC offered to the Science & Technology students in Sem.-I and II)

Sr. No.	BoS Proposing SEC	Code	Course Title	Credits	Hrs.
1	Chemistry	101CHE1601	Pesticides and Green Chemistry	02	30-45
2	Information Technology	101COM1601	Basics of Python Programming	02	30-45
3	Physics	101PHY1601	Physics Workshop Skills	02	30-45
4	Biotechnology	101BIO1601	Food Processing Technology	02	30-45
5	Botany	101BOT1601	Mushroom Cultivation Technology	02	30-45
6	English	101ENG1601	Proof Reading and Editing	02	30
7	Information Technology	101COA1601	PC Assemble and Installation	02	30-45
8	Marathi	101MAR1601	कथा/पटकथालेखन	02	30
9	Zoology	101ZOO1601	Bee Keeping	02	30-45

**Note: Student can choose any one SEC from the basket.**

शिव छत्रपती  
शिक्षण संस्था  
लातूर

॥ आरोह तमसो ज्योतिः॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

UG First Year

**Basket III: Ability Enhancement Courses (AEC)**

(AEC offered to the Science & Technology students in Sem.-I/II)

Sr. No.	BoS Proposing AEC	Code	Course Title	Credits	Hrs.
1	English	101ENG1701	English for Professionals-I	02	30
2	English	101ENG1701	English for Professionals-II	02	30



॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



Shiv Chhatrapati Shikshan Sanstha's  
**Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

UG First Year

**Extra Credit Activities**

Sr. No.	Course Title	Credits	Hours T/P
1	MOOCs	Min. of 02 credits	Min. of 30 Hrs.
2	Certificate Courses	Min. of 02 credits	Min. of 30 Hrs.
3	IIT Spoken English Courses	Min. of 02 credits	Min. of 30 Hrs.

**Guidelines:**

**Extra -academic activities**

1. All extra credits claimed under this heading will require sufficient academic input/contribution from the students concerned.
2. Maximum 04 extra credits in each academic year will be allotted.
3. These extra academic activity credits will not be considered for calculation of SGPA/CGPA but will be indicated on the grade card.

**Additional Credits for Online Courses:**

1. Courses only from SWAYAM and NPTEL platform are eligible for claiming credits.
2. Students should get the consent from the concerned subject Teacher/Mentor/Vice Principal and Principal prior to starting of the course.
3. Students who complete such online courses for additional credits will be examined/verified by the concerned mentor/internal faculty member before awarding credits.
4. Credit allotted to the course by SWAYAM and NPTEL platform will be considered as it is.

**Additional Credits for Other Academic Activities:**

1. One credit for presentation and publication of paper in International/National/State level seminars/workshops.
2. One credit for measurable research work undertaken and field trips amounting to 30 hours of recorded work.
3. One credit for creating models in sponsored exhibitions/other exhibits, which are approved by the concerned department.
4. One credit for any voluntary social service/Nation building exercise which is in collaboration with the outreach center, equivalent to 30 hours
5. All these credits must be approved by the College Committee.

### **Additional Credits for Certificate Courses:**

1. Students can get additional credits (number of credits will depend on the course duration) from certificate courses offered by the college.
2. The student must successfully complete the course. These credits must be approved by the Course Coordinators.
3. Students who undertake summer projects/ internships/ training in institutions of repute through a national selection process, will get 2 credits for each such activity. This must be done under the supervision of the concerned faculty/mentor.

### **Note:**

1. The respective documents should be submitted within 10 days after completion of Semester End Examination.
2. No credits can be granted for organizing or for serving as office bearers/ volunteers for Inter-Class / Associations / Sports / Social Service activities.
3. The office bearers and volunteers may be given a letter of appreciation by the respective staff coordinators. Besides, no credits can be claimed for any services/activities conducted or attended within the college.
4. All claims for the credits by the students should be made and approved by the mentor in the same academic year of completing the activity.
5. Any grievances of denial/rejection of credits should be addressed to Additional Credits Coordinator in the same academic year.
6. Students having a shortage of additional credits at the end of the third year can meet the Additional Credits Coordinator, who will provide the right advice on the activities that can help them earn credits required for graduation.

॥ आरोह तमसो ज्योतिः ॥

Rajarshi Shahu Mahavidyalaya,  
Latur (Autonomous)



**Shiv Chhatrapati Shikshan Sanstha's  
Rajarshi Shahu Mahavidyalaya, Latur**

(Autonomous)

**Examination Framework**

**Theory:**

40% Continuous Assessment Tests (CATs) and 60% Semester End Examination (SEE)

**Practical:**

50% Continuous Assessment Tests (CATs) and 50% Semester End Examination (SEE)

Course	Marks	CAT & Mid Term Theory				CAT Practical		Best Scored CAT & Mid Term	SEE	Total
1	2	3				4		5	6	5 + 6
		Att.	CAT I	Mid Term	CAT II	Att.	CAT			
DSC/DSE/GE/OE/Minor	100	10	10	20	10	-	-	40	60	100
DSC	75	05	10	15	10	-	-	30	45	75
Lab Course/AIPC/OJT/FP	50	-	-	-	-	05	20	-	25	50
VSC/SEC/AEC/VEC/CC	50	05	05	10	05	-	-	20	30	50

**Note:**

1. All Internal Exams are compulsory
2. Out of 02 CATs best score will be considered
3. Mid Term Exam will be conducted by the Exam Section
4. Mid Term Exam is of Objective nature (MCQ)
5. Semester End Exam is of descriptive in nature (Long & Short Answer)
6. CAT Practical (20 Marks): Lab Journal (Record Book) 10 Marks, Overall Performance 10 Marks.