

**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 Computational Science**

**Board of Studies**  
**in**  
**Computational Science**  
**Rajarshi Shahu Mahavidyalaya, Latur**  
**(Autonomous)**

**w.e.f. June, 2023**  
**(In Accordance with NEP-2020)**

## **CERTIFICATE**

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

Date: 14/07/2023

Place: Latur



**(J.V. Mashalkar)**  
Chairperson  
Board of Studies in Computational Science  
Rajarshi Shahu Mahavidyalaya, Latur  
(Autonomous)



## Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

### Members of Board of Studies in the Subject Computational Science Under the Faculty of Science and Technology

Sr. No.	Name	Designation	In position
1	<b>Ms. J.V. Mashalkar</b> Coordinator, Department of Information Technology, Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)	Chairperson	Coordinator
2	<b>Dr. Parag Bhalchandra</b> Assistant Professor, School of Computational Science, S.R.T.M.U. Nanded	Member	V.C. Nominee
3	<b>Dr. S. S. Phulari</b> Incharge CCC, Vasantao Naik Marathwada Krushi Vidyapeeth, Parbhani	Member	Academic Council Nominee
4	<b>Prof. Smita R. Bhanap</b> Assistant Professor, Assistant Professor, Fergusson College(Autonomous), Pune	Member	Academic Council Nominee
5	<b>Dr. B. G. Kodge</b> Associate Professor, Swami Vivekanand Mahavidyalaya, Udgir	Member	Expert from outside for Special Course
6	<b>Mr. Sudhakar Gavhane</b> Senior Consultant Specialist with HSBC India Pvt. Ltd., Pune	Member	Expert from Industry
7	<b>Mr. Amol Kalekar</b> Associate Technical Architect, Sagitec Solutions Pvt. Ltd., Pune	Member	P.G. Alumni
8	<b>Dr. Upkar Varshney</b> Associate Professor, Department of CIS, Georgia State University , Atlanta, GA	Member	Invitee Member
9	<b>Dr. S. V. Patil</b>	Member	Faculty Member
10	<b>Prof. J. M. Jadhav</b>	Member	Faculty Member
11	<b>Prof. M. B. Bhatade</b>	Member	Faculty Member
12	<b>Prof. A. K. Shaikh</b>	Member	Faculty Member
13	<b>Prof. S. R. Jadhav</b>	Member	Faculty Member
14	<b>Prof. B. S. Gorde</b>	Member	Faculty Member
15	<b>Dr. Manisha Dhotre</b> Assistant Professor, R. S. M. Latur	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.Sc. Degree (Honors) in Computational Science under NEP-2020 which will be implemented from the academic year 2023-24.

Keeping in mind, the mission statement of institution "Pursuit for Excellence" and adhering to the core values 'Academic Excellence', 'Expand horizons of knowledge', 'Learning for Life' and 'Service to Nation', the implementation of NEP 2020 for all programmes is starting from the academic year 2023-24.

NEP-2020 focuses on key reforms in higher education by providing multidisciplinary and holistic education. It makes students the carrier of knowledge, wisdom and values with capability to adapt the changes.

While framing the draft syllabus of first year, the feedbacks received from stakeholders, the technological advancements and global IT industry requirements are considered. On the successful completion of courses designed under NEP-2020 will promote the overall development of students and enhance the employability of students.

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 of B.Sc. (Honors) in Computational Science First Year in accordance with NEP-2020.

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

I would like to express grateful thanks to all who are involved in the process of syllabus designing.

Thank you.



**(Ms. J. V. Mashalkar)**

Chairperson

Board of Studies in Computational Science



## Rajarshi Shahu Mahavidyalaya, Latur

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## Rajarshi Shahu Mahavidyalaya, Latur

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Faculty of Science and Technology

### Structure for Four Year Multidisciplinary Undergraduate Degree Programme in Computational Science 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. (IKS)	NA	NA	GE-II: 04 Cr.	VSC-II: 02 Cr. SEC-II: 02 Cr.	AEC- II MIL: 02 Cr. VEC- II: 02 Cr.	CC-II: 02 Cr. (NSS, NCC, Sports, Cultural)/ CEP-II: 02 Cr. (SES-II)/ OJT: 02 Cr. / Mini Project: 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**



## Rajarshi Shahu Mahavidyalaya, Latur

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### Department of Information Technology

#### B.Sc. (Degree) Computational Science

Year & Level	Semester	Course Code	Course Title	Credits	No. of Hrs.	
I 4.5	I	101COM1101 (DSC-I)	Programming in C	03	45	
		101COM1103	Lab Course-I	01	30	
		101COM1102 (DSC-II)	Computer Fundamentals and Office Automation	03	45	
		101COM1104	Lab Course-II	01	30	
		GE-I	From Basket	04	60	
		101COM1501 (VSC-I)	Statistical Computing	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	
	<b>Total Credits</b>				<b>22</b>	
	II	101COM2105 (DSC-III)	C++ Programming	03	45	
		101COM2107	Lab Course-III	01	30	
		101COM2106 (DSC-IV) IKS	Computer Revolution in India	03	45	
		101COM2108	Lab Course-IV	01	30	
		GE-II	From Basket	04	60	
		101COM2502 (VSC-II)	Digital Computer Fundamentals	02	45	
		(SEC-II)	From Basket	02	30	
		(AEC-II)	From Basket	02	30	
		(VEC-II)	FSRCE (CBPR)	02	30	
AIPC/OJT-II		Case Study	02	60		
<b>Total Credits</b>				<b>22</b>		
<b>Total Credits (Semester I &amp; II)</b>				<b>44</b>		





## Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Faculty of Science & Technology

Programme Outcomes (POs) for B.Sc. Programme	
<b>PO 1</b>	Develop problem solving skills through programming
<b>PO 2</b>	Enhance critical thinking, logical and communication skill
<b>PO 3</b>	Train to have hands on various programming languages for application development
<b>PO 4</b>	Prepare for project management, effective presentations and teamwork
<b>PO 5</b>	Augment the current trends of IT in the domain of research and development
<b>PO 6</b>	Provide training to students in order to enhance employability
<b>PO 7</b>	Develop entrepreneurial skills to initiate startups



## Rajarshi Shahu Mahavidyalaya, Latur

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<b>Programme Specific Outcomes (PSOs) for B.Sc. Computational Science (Degree)</b>	
<b>PSO No.</b>	Upon completion of this programme the students will be able to
<b>PSO 1</b>	Analyze and write appropriate algorithms for given problem
<b>PSO 2</b>	Analyze, explore and build up computer programs for designing computer-based systems
<b>PSO 3</b>	Explain the history of the discipline of Computer Science and understand the conceptual underpinnings of the subject
<b>PSO 4</b>	Apprise the basic theory of computer architectures, including nature of operating systems and compilers, computer hardware and networking
<b>PSO 5</b>	Apply standard software engineering practices and strategies in the software development process using programming with proper documentation
<b>PSO 6</b>	Design and develop software applications of various domains using one or two programming languages
<b>PSO 7</b>	Learn latest development and technologies in IT and Communication system
<b>PSO 8</b>	Apply in-depth expertise to address local/regional/national/global real world research problems



## Rajarshi Shahu Mahavidyalaya, Latur

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Department of Information Technology

Course Type: DSC-I

Course Title: Programming in C

Course Code: 101COM1101

Credits: 03

Max. Marks: 75

Lectures: 45 Hrs.

### Learning Objectives:

- LO 1. Understand the fundamental concepts and techniques of C programming
- LO 2. Learn formulation of algorithm for a given problem and drawing flowchart for it
- LO 3. Learn input-output, control and iterative statements in C
- LO 4. Study concepts of C programming such as arrays, functions
- LO 5. Write programs for given problem and execute it
- LO 6. Develop logical and programming skill

### Course Outcomes:

After completion of course the student will be able to-

- CO 1. Formulate an algorithm for the given problem and draw flowchart for it
- CO 2. Explain basic concepts of C
- CO 3. Make use of control and iterative statements for problem solving
- CO 4. Employ the major concepts of C such as arrays, structure and union in applications
- CO 5. Describe and analyze various problem-solving methods using C
- CO 6. Enhance an understanding of the logical flow of a program

Unit No.	Title of Unit & Contents	Hrs.
I	<b>Overview of C</b>	12
	<ol style="list-style-type: none"><li>1. Algorithm, Flowchart and its symbols</li><li>2. <b>Introduction to C:</b> History of C, Importance of C, Basic structure of C program, Data Types, C tokens, Keywords, Identifiers, Constants, Variables, Declaration of variables, assigning values to variables, Defining symbolic constants, Sample C programs, Execution of C program</li><li>3. <b>Input and Output Statements:</b> Input statements, Output statements, reading character, writing character, formatted input and output statements, Command line arguments, Simple Programs</li></ol>	
	<b>Unit Outcomes:</b> UO 1. Formulate an algorithm for the given problem and draw flowchart for it UO 2. Explain the basic concepts of C	

Unit No.	Title of Unit & Contents	Hrs.
<b>II</b>	<b>Branching and Looping</b>	<b>12</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. Storage Classes:</b> auto, register, static, external</p> <p><b>3. Branching and Looping:</b> Simple if statement, Nested, Ladder if-else statement. Switch statement, break, continue, goto, exit statement, while statement, do-while statement, for statement, Simple programs on branching and looping</p> <p><b>Unit Outcomes:</b> UO 1. Make use of control and iterative statements for solving given problem UO 2. View and manage execution flow of program</p>	
<b>III</b>	<b>Arrays and Strings</b>	<b>11</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, putting strings together, string handling functions: strlen, strcpy, strcat, strcmp, strlwr,strupr</p> <p><b>Unit Outcome:</b> UO 1. Employ the major concepts of C such as arrays and strings while developing applications</p>	
<b>IV</b>	<b>Advance Concepts of C</b>	<b>10</b>
	<p><b>1. Functions:</b> Definition of function. Return values and their types, Function declaration, Function calls, Categories of function, Nesting of function, Recursion, Mathematical function</p> <p><b>2. Structure and Union:</b> Defining structure, declaring structure members and structure variables, arrays as structure, arrays within structure, union</p> <p><b>3. Pointers:</b> Understanding Pointers, Accessing the address of variables, Declaring and initializing pointers, Accessing a variable through pointers</p> <p><b>4. File Handling:</b> Opening and closing file, I/O statements in file handling: fprintf(), fscanf()</p>	

Unit No.	Title of Unit & Contents	Hrs.
	<b>Unit Outcomes:</b> UO 1. Utilize functions, structure and union concepts for developing console projects	

**Learning Resources:**

1. Programming in ANSI C, E. Balgurusamy, 7th Edition, TMH Publications, 2018
2. Programming with ANSI and TURBO C, Ashok N. Kamthane, Pearson Education, 2002
3. Programming with C, S. Byron Gottfried, TMH, 2018
4. The C Programming Language, Kernighan & Ritchie, Prentice-Hall, 1988
5. Let us C, Yashwant Kanetkar, 13th Edition, BPB, 2013
6. Programming in C, P.B. Kotur, Sapna Book House, 2013
7. Computer Programming and IT, Ashok N. Kamthane, Pearson Education, 2011
8. Thinking In C, Mahapatra, PHI Publications, 1998.
9. C: The Complete Reference, Herbert Schildt, 4<sup>th</sup> edition, McGraw Hill Publication, 2017



## Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Department of Information Technology

**Course Type: Lab Course**

**Course Title: Lab Course –I (Based on DSC-I)**

**Course Code: 101COM1103**

**Credits: 01**

**Max. Marks: 50**

**Hours: 30**

### Learning Objectives

- LO 1. Understand the fundamental concepts and techniques of C programming
- LO 2. Learn input-output, control and iterative statements in C
- LO 3. Study concepts of C programming such as arrays, functions
- LO 4. Write programs for given problem and execute it
- LO 5. Develop logical and programming skill

### Course outcomes

After completion of course the student will be able to-

- CO 1. Explain basic concepts of C and implement given algorithm using C programming
- CO 2. Demonstrate control and iterative statements through programming
- CO 3. Employ the major concepts of C such as arrays, structure and union in applications
- CO 4. Describe and analyze various problem-solving methods using C
- CO 5. Enhance an understanding of the logical flow of a program

Practical No.	Unit
1	Write a C program to find the area of a circle. Accept radius from user.
2	Input length and breadth from user and implement a C program to find the area of a rectangle.
3	Write C program to calculate simple interest and compound interest and demonstrate it.
4	Design, write and execute a C program to convert temperature in Fahrenheit to Celsius and Celsius to Fahrenheit.
5	Write C program to find the GCD and LCM of two integer numbers.
6	Design C program to check whether the given integer is even or odd using if condition statement.
7	Write a C program to accept three integers and determine largest among them using if statement.
8	Implement C program to simulate a simple calculator with addition,

	subtraction, multiplication, division using switch case.
9	Write a C program to print number from 1 to 100 which are divisible by 7 and display their sum and count using for loop.
10	Write a C program to reverse a given integer number and check whether the number is palindrome or not using while loop.
11	Write a C program to check whether given number is prime or not using while loop.
12	Design and implement C program to display the pattern given below using nested for loop <pre>           *          * *         * * *        * * * *       * * * * * </pre>
13	Write a C program to read N integers into an array and find sum of all numbers.
14	Design and implement C program to find the addition of two matrices.
15	Implement and demonstrate C program to calculate the factorial of a number using function.

N.B.: Any Ten Practicals from above.



## Rajarshi Shahu Mahavidyalaya, Latur

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Department of Information Technology

**Course Type: DSC-II**

**Course Title: Computer Fundamentals and Office Automation**

**Course Code: 101COM1102**

**Credits: 03**

**Max. Marks: 75**

**Lectures: 45 Hrs.**

### Learning Objectives

- LO 1. Study computer peripherals, software and office tools
- LO 2. Learn how to install and use MS-Office applications
- LO 3. Understand office tools to create professional and academic documents
- LO 4. Acquire basics of spreadsheets and presentations
- LO 5. Enhance employability skill of students

### Course outcomes

After completion of course the student will be able to-

- CO 1. Explain the basics of computer system
- CO 3. Study computer peripherals, software and office tools
- CO 2. Install and use MS-Office applications
- CO 3. Use Microsoft Office tools to create professional and academic documents
- CO 4. Create charts and data using advanced formulas and functions in MS-Excel
- CO 5. Create effective presentations using MS-Powerpoint

Unit No.	Title of Unit & Contents	Hrs.
I	<b>Computer System Organization</b>	11
	<b>1. Introduction to Computer System:</b> Characteristics of Computers, Generations of computer, <b>2. Classification of computers:</b> Notebook computers, Personal Computers, Workstations, Mainframes system, Supercomputers <b>3. Basic Computer Organization:</b> Input Unit, Output Unit, Storage Unit, Arithmetic and Logic Unit (ALU), Control Unit(CU), Central Processing Unit(CPU) <b>4. Data Representation within Computer:</b> Bit, Byte, Word <b>5. Codes:</b> ASCII, EBCDIC, BCD	
	<b>Unit Outcomes:</b> UO 1. Explain the basics of Computer System UO 2. Describe the data representation in computer	



Unit No.	Title of Unit & Contents	Hrs.
<b>II</b>	<b>Computer Peripherals and Software</b>	<b>13</b>
	<p><b>1. Input Devices:</b> Keyboard, Pointing devices: Mouse, Joystick, Touch Screen, Data Scanning devices, Digitizer, Electronic Card Reader, Voice Recognition devices</p> <p><b>2. Output Devices:</b> Monitor, Printer, Plotter, Screen image projector, voice response system</p> <p><b>3. Primary Storage Devices:</b> RAM, ROM, PROM, EPROM, EEPROM, Base Memory, Extended memory, expanded memory, cache memory</p> <p><b>4. Secondary Storage Devices:</b> Tape, FDD, HDD, CD ROM, Pen drive</p> <p><b>5. Computer Software:</b> Definition of software, Types of software</p> <p><b>6. Types of Programming Languages:</b> Machine Language, Assembly Language, High Level Language</p> <p><b>Unit Outcome:</b>            UO 1. Use computer peripherals such as input, output and storage devices effectively</p>	
<b>III</b>	<b>MS-Word</b>	<b>11</b>
	<p>1. MS-Word Screen and its Components</p> <p>2. <b>Working with Text:</b> Typing and inserting text, selecting text, deleting text, Undo, formatting toolbar, Format Painter</p> <p>3. <b>Formatting Paragraphs:</b> Moving, Copying, and Pasting text, the clipboard, Columns, Drop caps</p> <p>4. <b>Lists and Table Manipulations:</b> Bulleted and numbered lists, Insert table, Drawing a table, Inserting rows and columns, Moving and resizing a table, Tables and Borders</p> <p>5. <b>Page Formatting:</b> Page margins, Page size and orientation, Headers and footers, Page numbers, Print preview and printing</p> <p><b>Unit Outcomes:</b>            UO 1. Differentiate between various office related software applications            UO 2. Utilize MS-Word tool effectively to perform documentation work</p>	
<b>IV</b>	<b>MS-Excel and MS-Powerpoint</b>	<b>10</b>
	<p>1. <b>Working with worksheet:</b> Adding worksheets, Rows and columns, Resizing rows and columns, Selecting cells, Moving and copying cells, Freezing panes</p> <p>2. <b>Formulas and Functions:</b> Formulas, linking worksheets, Relative, absolute, and mixed referencing, Basic functions,</p>	

Unit No.	Title of Unit & Contents	Hrs.
	Function Wizard, Autosum 3. <b>Sorting and Filling:</b> Basic ascending and descending sorts, Autofill, Alternating text and numbers with Autofill 4. <b>Charts:</b> Chart Wizard, Resizing a chart, Moving a chart, Chart formatting toolbar 5. <b>MS-PowerPoint:</b> Introduction, Create a presentation from a template, Create a blank presentation, Open an existing presentation 6. <b>Working with Slides:</b> Insert a new slide, Applying a design template, Changing slide layouts, Reordering slides, Hide slides, Create a custom slide show, Edit a custom slide show 7. <b>Slide Effects:</b> Slide animation, Animation preview, Slide transitions, Slide show options, Master Slides, Slide master, Header and footer, Slide numbers, Date and time	
	<b>Unit Outcomes:</b> UO 1. Use advanced formulas and functions to represent data in MS-Excel UO 2. Create effective presentations on a particular topic	

### Learning Resources:

1. Computer Fundamentals, Pradeep K. Sinha and Priti Sinha, Sixth Edition, BPB Publication, 2017
2. Fundamentals of Computers, V Rajaraman, Neeharika Adabala, PHI Learning Pvt. Ltd., 2015
3. Introduction to Computers, Peter Norton, Tata McGraw Hill, 1995
4. Fundamentals of Information Technology, Chetan Srivastava, Kalyani Publishers, Third edition, 2010
5. PC Hardware: The Complete Reference, Tata McGraw Hill, 2017
6. Fundamentals of Computer and Information Technology, R.S. Salaria, Khanna Publishers, 2022
7. Computer Fundamentals, Anita Goel, Pearson Education, 2010
8. Fundamentals of Computers, Reema Thareja, Oxford, 2014
9. Foundations of Computing, Pradeep K. Sinha, Priti Sinha, Fifth Edition, BPB Publications, 2022
10. Fundamentals of Computers and Information System by Niranjana Shrivastava, Wiley India, 2013
11. MS OFFICE 2000 Complete, BPB Publications, New Delhi, 1999
12. Working with MS OFFICE, Ron Mansfield, Tata Mc Graw Hill – 2000 Edition
13. Microsoft Office 2016 Step By Step, Curtis Frye, Joan Lambert, Microsoft Press, 2015
14. MS-Office 2007 Training Guide, S. Jain, S Jain, BPB Publications, 2007
15. Microsoft Excel 2019 Bible, Michael Alexander, Wiley, 2019



## Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Department of Information Technology

**Course Type: Lab Course**

**Course Title: Lab Course –II (Based on DSC-II)**

**Course Code: 101COM1104**

**Credits: 01**

**Max. Marks: 50**

**Hours: 30**

### Learning Objectives

- LO 1. Study computer peripherals, software and office tools
- LO 2. Learn how to install and use MS-Office applications
- LO 3. Understand office tools to create professional and academic documents
- LO 4. Acquire basics of spreadsheets and presentations
- LO 5. Enhance employability skill of students

### Course outcomes

After completion of course the student will be able to-

- CO 1. Explain the basics of computer system
- CO 3. Study computer peripherals, software and office tools
- CO 2. Install and use MS-Office applications
- CO 3. Use Microsoft Office tools to create professional and academic documents
- CO 4. Create charts and data using advanced formulas and functions in MS-Excel
- CO 5. Create effective presentations using MS-Powerpoint

Practical No.	Unit
1	Identify computer hardware and software
2	Study of elements of Windows OS
3	Study of Windows explorer: <ul style="list-style-type: none"><li>a. Create a new folder and a file</li><li>b. Copy the created file to a new folder</li><li>c. Rename, Copy and Delete the created file and folder</li></ul>
4	Study of control panel
5	Demonstrate the usage of various storage devices
6	Create an application and prepare a resume to apply for a job in a IT company. Apply page and paragraph formatting to the above document.
7	Create a newspaper document with at least 200 words in two column format and having an image.
8	Create a table using two columns: the left column contains all the short-

	cut keys and right side column contains the function of the short-cut keys																
9	Create a letter to invite your friend for a family function with at least 100 words and two paragraphs. The date must be in top-right corner.																
10	Create a table "Student_Result" in MS-Excel with following fields. Sr. No., Name, Sub1, Sub2, Sub3, Total, Percentage, Result. Calculate Total and Percentage.																
11	Create a sales table using the following data and draw the bar-graph to compare the sales of the five items for three years: <table border="1" data-bbox="486 622 1407 878"> <thead> <tr> <th>Item</th> <th>2019</th> <th>2020</th> <th>2021</th> </tr> </thead> <tbody> <tr> <td>Item1</td> <td>1000</td> <td>1200</td> <td>1100</td> </tr> <tr> <td>Item2</td> <td>950</td> <td>1200</td> <td>1150</td> </tr> <tr> <td>Item3</td> <td>1100</td> <td>900</td> <td>1250</td> </tr> </tbody> </table>	Item	2019	2020	2021	Item1	1000	1200	1100	Item2	950	1200	1150	Item3	1100	900	1250
Item	2019	2020	2021														
Item1	1000	1200	1100														
Item2	950	1200	1150														
Item3	1100	900	1250														
12	Create presentation of seminar on a particular topic with minimum five slides. Apply animation to the presentation																
13	Create presentation of books of Computer Science with all its details. Apply text formatting animation to the presentation																

N.B.: Any Ten Practicals from above.



## Rajarshi Shahu Mahavidyalaya, Latur

(Autonomous)

Department of Information Technology

Course Type: VSC-I

Course Title: Statistical Computing

Course Code: 101COM1501

Credits: 02

Max. Marks: 50

Lectures: 30 Hrs.

### 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
- LO 5. Compute and interpret various measures of central tendency and dispersion

### 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. Work with range of data to find the variance and coefficient
- CO 5. Apply knowledge of statistics in career fields like Data Science

Unit No.	Title of Unit & Contents	Hrs.
I	<b>Statistics and Graphical Representation</b>	8
	<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 Outcome:</b> UO 1. To acquire a strong foundation in statistical analytics by applying techniques of data representation	
II	<b>Measures of Central Tendency</b>	7
	<b>1.</b> Concept of central tendency <b>2. Arithmetic Mean:</b> Definition, Formulae and computation for ungrouped and grouped, data, Merits and Demerits <b>3. Median:</b> Definition, Formulae and Computation for ungrouped and grouped data, Merits and Demerits <b>4. Mode:</b> Definition, Formulae and Computation for ungrouped and grouped data, Merits and Demerits	

	<p><b>Unit Outcome:</b>          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. Concept of Dispersion</b>  <b>2. Range:</b> Definition, Formulae and Computation for ungrouped and grouped data  <b>3. Standard Deviation:</b> Definition, Formulae and Computation for ungrouped and grouped data  <b>4. Variance:</b> Definition, Formulae and Computation for ungrouped and grouped data</p>	
	<p><b>Unit Outcome:</b>          UO 1. To compute and interpret various measures of dispersion</p>	
<b>IV</b>	<b>Correlations and Time Series</b>	<b>7</b>
	<p><b>1. Correlations:</b> Definition of Correlation, Types of Correlation, Karl Pearson's coefficient of correlations for ungrouped data and problems.  <b>2. Time Series:</b> Definition and components of time series, Measures of trends, Moving average method and problems</p>	
	<p><b>Unit Outcome:</b>          UO 1. Utilize concepts of co-relations and time series</p>	
<b>V</b>	<b>Practicals (Included in above 04 units)</b>	
	<p>1. Study of histogram: Construct histogram for given statistical data          2. Construct frequency polygon for given statistical data          3. Draw frequency curve for given statistical data          4. Draw and construct ogive for given statistical data          5. Construct simple bar diagram for given statistical data          6. Draw subdivided bar diagram for given statistical data          7. Draw pie diagram for given statistical data          8. Calculate various measures of central tendency (mean, median, mode) on given data          9. Compute various measure of dispersion (range, standard deviation, CV) of given data          10. Compute coefficient of correlation of given statistical data</p>	

### **Learning Resources:**

1. Fundamentals of Statistics by A.M. Gun, M. K. Gupta and B. Dasgupta, World Press, 2016
2. Statistical Methods by S.P. Gupta, Sultan Chand and Sons, 2021
3. Business Mathematics and Statistics by R K Ghosh & S Saha, New Central Book Agency (p). Ltd, 2016
4. Modern Elementary Statistics by J.E. Freund, Pearson Education, 2000
5. Fundamentals of Mathematical Statistics by S C. Gupta & V.K. Kapoor, Sultan Chand & Sons, 2000
6. Fundamentals of Applied Statistics, S.C. Gupta, Sultan Chand and Sons, 2014
7. Probability and statistics with reliability queuing and computer science applications by K. S. Trivedi, Wiley, 2016
8. Elements of Statistics 1: Descriptive Statistics And Probability / 1st, Edition, Stephen Bernstein, Ruth Bernstein, McGraw Hill, 2020
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



## 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)

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	स्पर्धा परीक्षा 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.**





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(Autonomous)

UG First Year

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

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

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.**



**Rajarshi Shahu Mahavidyalaya, Latur**

**(Autonomous)**

**UG First Year**

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

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

<b>Sr. No.</b>	<b>BoS Proposing AEC</b>	<b>Code</b>	<b>Course Title</b>	<b>Credits</b>	<b>Hrs.</b>
1	English	101ENG1701	English for Professionals - I	02	30



## **Rajarshi Shahu Mahavidyalaya, Latur**

**(Autonomous)**

**UG First Year**

### **Extra Credit Activities**

<b>Sr. No.</b>	<b>Course Title</b>	<b>Course Code</b>	<b>Credits</b>	<b>Hours T/P</b>
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.



## 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
		3				4				
1	2	Att.	CAT I	Mid Term	CAT II	Att.	CAT	5	6	5 + 6
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.