St. Bede's College Shimla

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3.2.2 NUMBER OF WORKSHOPS/SEMINARS CONDUCTED ON RESEARCH METHODOLOGY, INTELLECTUAL PROPERTY RIGHTS (IPR) AND ENTREPRENEURSHIP DURING THE YEAR

St. Bede's College Shimla

SIX-DAY ONLINE WORKSHOP ENTITLED 'SPREADSHEETS: A TOOL FOR DEVELOPING MATHEMATICAL & COMPUTATIONAL SKILLS IN UG STUDENTS

St. Bede's College
Shimla-171002
(UGC-NAAC "A+" Grade Re-Accredited)
College with Potential for Excellence
Phone: 0177-2842304, Fax:- 0177-2842498
www.stbedescollege.in,E-mail:- bedescollege@gmail.com

SIX-DAY ONLINE WORKSHOP ENTITLED 'SPREADSHEETS: A TOOL FOR DEVELOPING MATHEMATICAL & COMPUTATIONAL SKILLS IN UG STUDENTS'

A six-day workshop was organised from 15 February to 20 February 2021 as a structured class with exposure to problems drawn from physics, chemistry and mathematics in the form of assignments, quizzes and discussion board. Students were also sensitized towards visualisation of scientific data, computing complex problems by developing a schemata for implementing it on spreadsheets on the fly. The resource persons were Prof. P.K.Ahluwalia. (Retd.) Prof. Physics, Himachal Pradesh University, Dr. Sarmistha Sahu (Retd.) Assoc. Professor, Department of Physics, Maharani Lakshmi Ammanni College for Women, Science Post, Bangalore and Dr. Sapna Sharma, Associate Professor, Department of Physics, St. Bede's College Shimla. The workshop aimed at enabling students to make use of spreadsheets as a means of representing scientific data and computing complex and to plot various types of graphs to display data and visualize the patterns.

Objectives:

- To introduce students to various spreadsheet functions, formulas, and features.
- To familiarize UG students with data analysis techniques, including sorting, filtering, and pivot tables, and demonstrate how spreadsheets can be used to visualize data through charts and graphs.
- To empower students with data-driven decision-making skills and the ability to communicate complex data effectively through visual representations.
- To equip students with essential computational skills that are applicable in a wide range of disciplines and professions.
- To develop practical applications of spreadsheets in real-world scenarios
- To develop problem-solving and critical thinking skills among UG students by engaging them in spreadsheet-based activities that require them to analyze, interpret, and manipulate data to arrive at solutions.
- To build students' confidence in using spreadsheet software as a powerful tool for mathematical and computational tasks.
- To empower students to use spreadsheets independently and confidently, thus enhancing their overall technical skills and preparing them for future academic and professional endeavours.

Day1:

On the first day of the workshop, the keynote speaker, Prof. P.K. Ahluwalia, delivered an enlightening talk entitled "Developing Mathematical and Computational Thinking of Science Students as per the New Education Policy." Prof. Ahluwalia began by discussing the importance of mathematical and computational thinking in the current education landscape. He highlighted how these skills are essential for students pursuing science subjects, as they form the backbone of many scientific disciplines. He also emphasized that with the recent changes in education policy, it is

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Report of the Workshop

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crucial to re-examine the ways in which we teach these skills to students. Then he shifted his talk on the topic Spreadsheet: Overview of a Killer Application.

He highlighted how spreadsheets is a fundamental tool in today's workplace, with applications ranging from budgeting and financial analysis to project management and data analysis and have evolved into sophisticated software packages that can handle complex calculations, data manipulation, and visualizations such as charts and graphs, which can be used to present data in a meaningful way.

Day 2:

On the second day of the workshop, Prof. P.K. Ahluwalia delivered a talk titled "Beyond a Simple Worksheet: Macros, User-Defined Functions, and Subroutines". He highlighted the various powerful tools available in Microsoft Excel that can help automate and streamline workflows beyond the basic functions of a worksheet. By using these tools, productivity can be increased, and time can be saved. During the talk, Prof. Ahluwalia demonstrated how to create a macro using the Macro Recorder tool in Excel. This tool records the actions performed and generates a Visual Basic for Applications (VBA) code that can be replayed later. The code can also be edited to customize the macro to suit specific needs. Additionally, he explained the process of creating a Subroutine by writing VBA code. This enables users to create more complex and customized functions to perform specific tasks.

"An Undergraduate Computational Physics Course: Implementation Using Spreadsheets."

Day3:

Dr. Sapna Sharma discussed the implementation of an undergraduate computational physics course using spreadsheets. She emphasized the advantages of using spreadsheets in teaching fundamental concepts of computational physics, such as ease of use, versatility, and a familiar interface. By taking a hands-on approach to learning, students can gain a better understanding of the underlying physics and the practical application of numerical methods and data analysis. The topics discussed were:

- Spreadsheet & its Features
- Data entry into a spreadsheet.
- Performing basic mathematical tasks in a spreadsheet.
- Insert charts/graphs in a spreadsheet.
- Exercises in spreadsheet.

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Day 4:

On Day 4, Dr. Sapna Sharma gave a presentation on the importance of error analysis in laboratory work and how spreadsheets can facilitate this task. The topic was "Spreadsheet as a tool Kit for Science Laboratories: Data Handling and Error Analysis". During her talk, Dr. Sharma covered a range of topics related to error analysis, including types of errors, ways of expressing errors, propagation of errors, absolute and fractional uncertainties, and combining errors in formulas. She also provided practical examples of how spreadsheets can be used to perform error analysis, such as assigning values to variables and evaluating the uncertainty of results.

Day 5

On the fifth day of the event, Dr. Sarmishtha Sahu gave a presentation on the topic "Trouble Shooter of Physics: Classical and Quantum Oscillator". During her talk, she emphasized the versatility of spreadsheets as a tool for modeling, analyzing, and visualizing Classical and Quantum Oscillator systems. By utilizing spreadsheets, researchers and professionals in the field can enhance their understanding of these systems and make more precise predictions regarding their behavior. Dr. Sahu's talk shed light on the potential of utilizing spreadsheets in Physics research and provided insights into how this tool can aid in problem-solving.

Day 6

On the sixth day of the event, Dr. Sarmishtha Sahu presented an intriguing topic titled "Hitting the Bull's Eye: Let's Calculate Pi (π)Using a Monte Carlo Approach". In her presentation, she discussed a unique and engaging method of calculating the value of Pi (π) using statistical analysis through random sampling, also known as the Monte Carlo approach. She provided step-by-step instructions on how to use random sampling to estimate the value of Pi (π) through a Monte Carlo approach in a spreadsheet. Additionally, Dr. Sahu emphasized that the accuracy of the estimate of Pi (π) increases with the number of random points used in the calculation. Hence, individuals can achieve a more precise value of Pi (π) by incorporating a greater number of points in their statistical analysis. Overall, Dr. Sahu's presentation provided a unique and interactive approach to learning about the value of Pi (π) through statistical analysis.

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Outcomes:

- Students learned computational skills by using spreadsheets as a tool for solving complex problems. They learned to create and use macros, automate repetitive tasks, and apply conditional formatting to manipulate data. They also learned to analyze and interpret data using tools such as pivot tables and data validation.
- Students learned how to analyze data using spreadsheets, including sorting, filtering, and data validation techniques. They also learned how to create visually appealing charts and graphs to represent data in a meaningful and impactful way.
- During the course, students developed problem-solving skills by using spreadsheets to solve real-world problems. They also developed critical thinking skills by using spreadsheets to analyze and interpret data, and make informed decisions based on the results.

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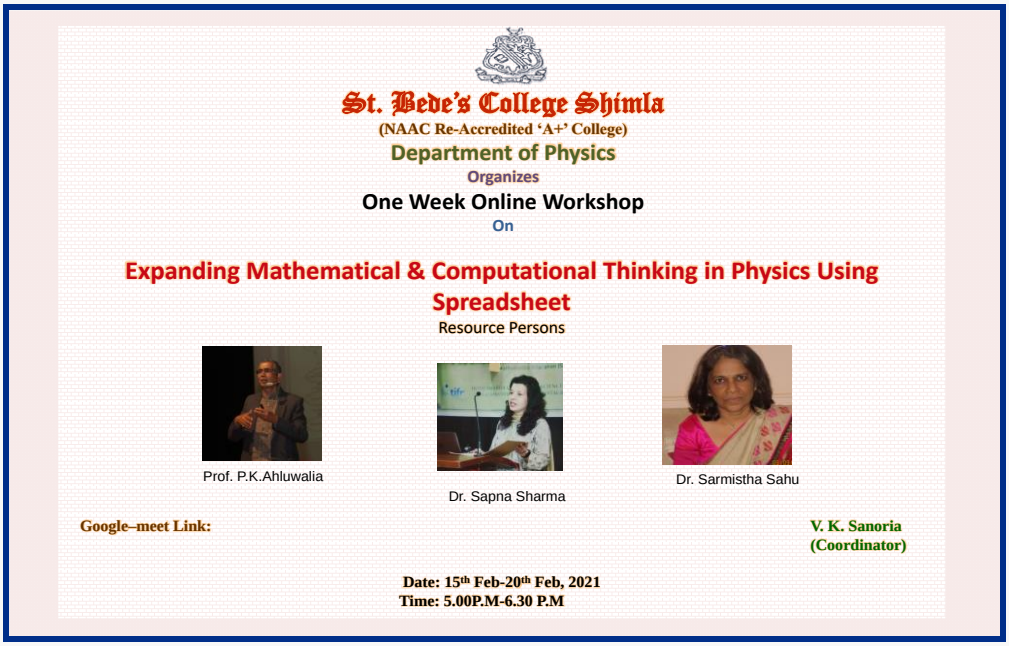
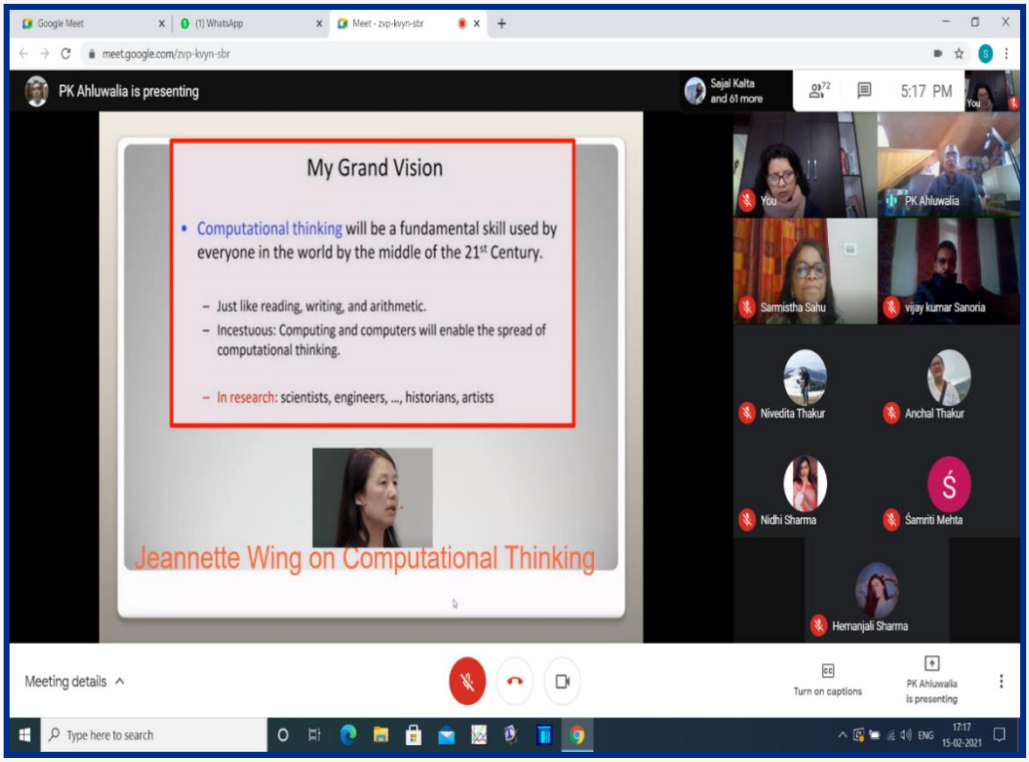


Brochure



Workshop on 'Spreadsheets: A Tool for Developing Mathematical & Computational Skills in UG students' from February (15-20, 2021)

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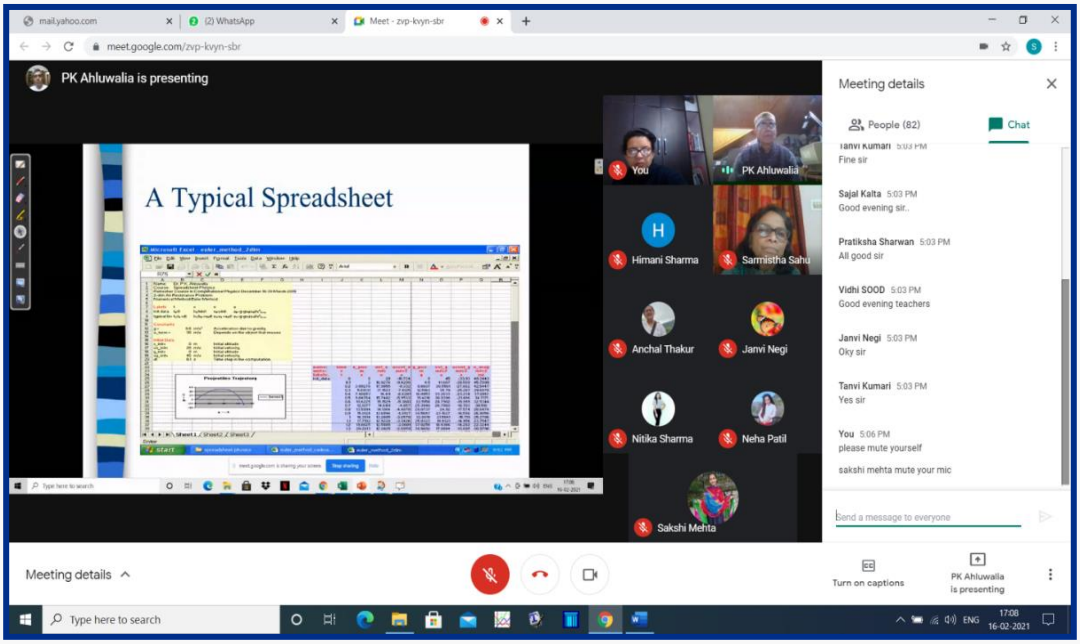

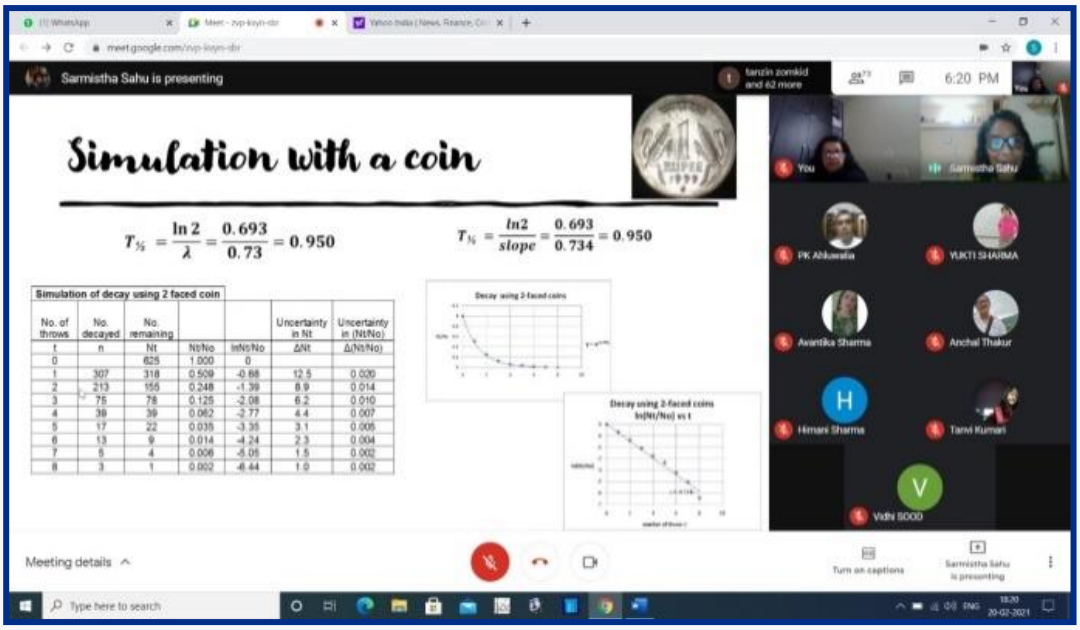

No. of throws	No. decayed	No. remaining			Uncertainty in Nt	Uncertainty in (Nt/No)
t	n	Nt	Nt/No	lnNt/No	ΔNt	Δ(Nt/No)
0		625	1.000	0		
1	307	318	0.509	-0.68	12.5	0.020
2	213	155	0.248	-1.39	8.9	0.014
3	75	78	0.125	-2.08	6.2	0.010
4	39	39	0.062	-2.77	4.4	0.007
5	17	22	0.035	-3.35	3.1	0.005
6	13	9	0.014	-4.24	2.3	0.004
7	5	4	0.006	-5.05	1.5	0.002
8	3	1	0.002	-6.44	1.0	0.002

Workshop on 'Spreadsheets: A Tool for Developing Mathematical & Computational Skills in UG students' from February (15-20, 2021)

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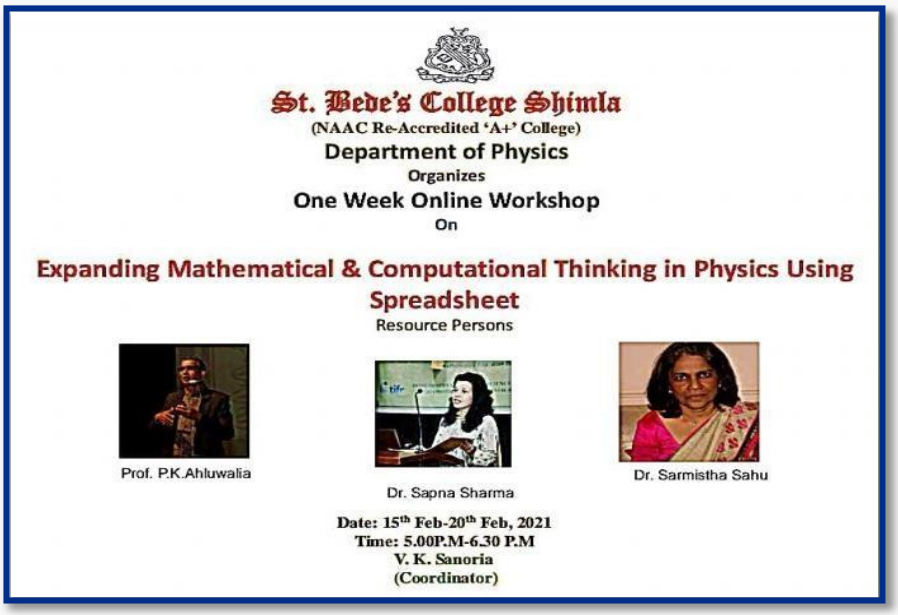
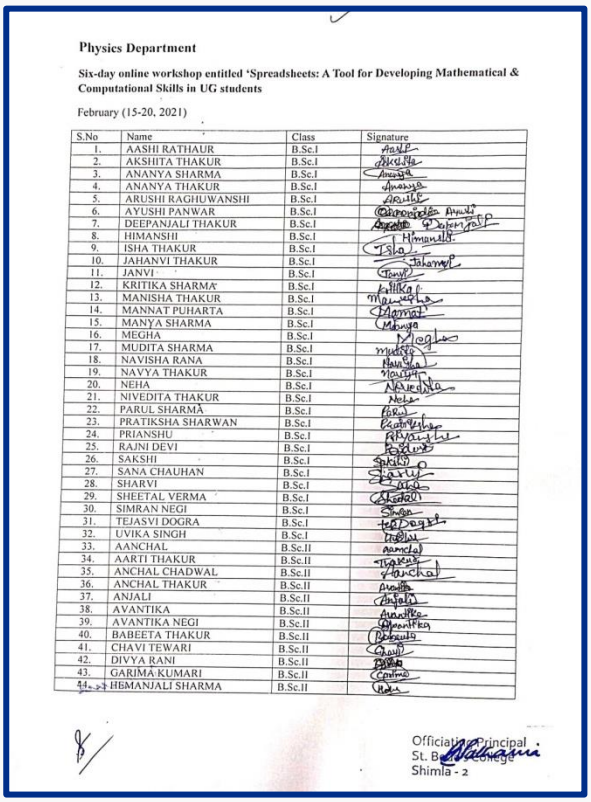


Workshop on 'Spreadsheets: A Tool for Developing Mathematical & Computational Skills in UG students' from February (15-20, 2021)



Physics Department

Six-day online workshop entitled 'Spreadsheets: A Tool for Developing Mathematical & Computational Skills in UG students

February (15-20, 2021)

S.No	Name	Class	Signature
1.	AASHI RATHAUR	B.Sc.I	
2.	AKSHITA THAKUR	B.Sc.I	
3.	ANANYA SHARMA	B.Sc.I	
4.	ANANYA THAKUR	B.Sc.I	
5.	ARUSHI RAGHUWANSHI	B.Sc.I	
6.	AYUSHI PANWAR	B.Sc.I	
7.	DEEPANJALI THAKUR	B.Sc.I	
8.	HIMANSHI	B.Sc.I	
9.	ISHA THAKUR	B.Sc.I	
10.	JAHANVI THAKUR	B.Sc.I	
11.	JANVI	B.Sc.I	
12.	KRITIKA SHARMA	B.Sc.I	
13.	MANISHA THAKUR	B.Sc.I	
14.	MANNAT PUHARTA	B.Sc.I	
15.	MANYA SHARMA	B.Sc.I	
16.	MEGHA	B.Sc.I	
17.	MUDITA SHARMA	B.Sc.I	
18.	NAVISHA RANA	B.Sc.I	
19.	NAVYA THAKUR	B.Sc.I	
20.	NEHA	B.Sc.I	
21.	NIVEDITA THAKUR	B.Sc.I	
22.	PARUL SHARMA	B.Sc.I	
23.	PRATIKSHA SHARWAN	B.Sc.I	
24.	PRIANSHU	B.Sc.I	
25.	RAJNI DEVI	B.Sc.I	
26.	SAKSHI	B.Sc.I	
27.	SANA CHAUHAN	B.Sc.I	
28.	SHARVI	B.Sc.I	
29.	SHEETAL VERMA	B.Sc.I	
30.	SIMRAN NEGI	B.Sc.I	
31.	TEJASVI DOGRA	B.Sc.I	
32.	UVIKA SINGH	B.Sc.I	
33.	AANCHAL	B.Sc.II	
34.	AARTI THAKUR	B.Sc.II	
35.	ANCHAL CHADWAL	B.Sc.II	
36.	ANCHAL THAKUR	B.Sc.II	
37.	ANJALI	B.Sc.II	
38.	AVANTIKA	B.Sc.II	
39.	AVANTIKA NEGI	B.Sc.II	
40.	BABEETA THAKUR	B.Sc.II	
41.	CHAVI TEWARI	B.Sc.II	
42.	DIVYA RANI	B.Sc.II	
43.	GARIMA KUMARI	B.Sc.II	
44.	HEMANJALI SHARMA	B.Sc.II	

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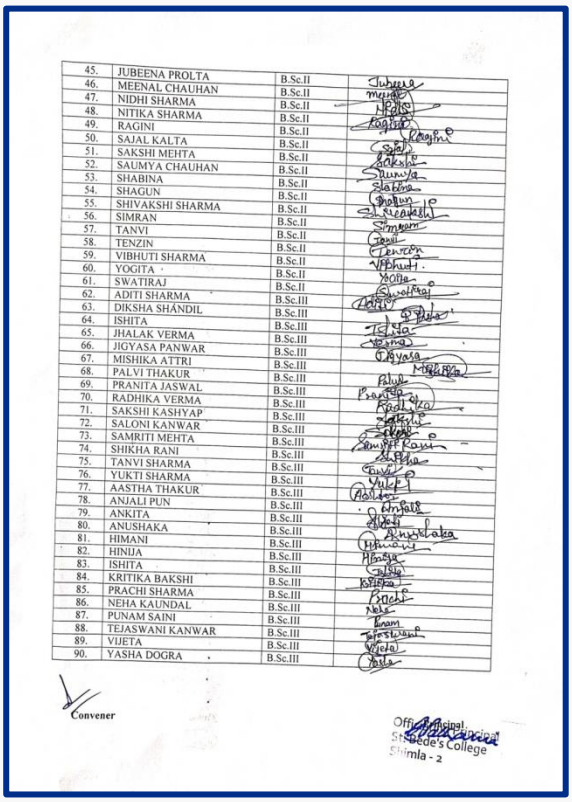

45.	JUBEENA PROLTA	B.Sc.II	
46.	MEENAL CHAUHAN	B.Sc.II	
47.	NIDHI SHARMA	B.Sc.II	
48.	NITIKA SHARMA	B.Sc.II	
49.	RAGINI	B.Sc.II	
50.	SAJAL KALTA	B.Sc.II	
51.	SAKSHI MEHTA	B.Sc.II	
52.	SAUMYA CHAUHAN	B.Sc.II	
53.	SHABINA	B.Sc.II	
54.	SHAGUN	B.Sc.II	
55.	SHIVAKSHI SHARMA	B.Sc.II	
56.	SIMRAN	B.Sc.II	
57.	TANVI	B.Sc.II	
58.	TENZIN	B.Sc.II	
59.	VIBHUTI SHARMA	B.Sc.II	
60.	YOGITA	B.Sc.II	
61.	SWATIRAJ	B.Sc.II	
62.	ADITI SHARMA	B.Sc.III	
63.	DIKSHA SHANDIL	B.Sc.III	
64.	ISHITA	B.Sc.III	
65.	JHALAK VERMA	B.Sc.III	
66.	JIGYASA PANWAR	B.Sc.III	
67.	MISHIKA ATTRI	B.Sc.III	
68.	PALVI THAKUR	B.Sc.III	
69.	PRANITA JASWAL	B.Sc.III	
70.	RADHIKA VERMA	B.Sc.III	
71.	SAKSHI KASHYAP	B.Sc.III	
72.	SALONI KANWAR	B.Sc.III	
73.	SAMRITI MEHTA	B.Sc.III	
74.	SHIKHA RANI	B.Sc.III	
75.	TANVI SHARMA	B.Sc.III	
76.	YUKTI SHARMA	B.Sc.III	
77.	AASTHA THAKUR	B.Sc.III	
78.	ANJALI PUN	B.Sc.III	
79.	ANKITA	B.Sc.III	
80.	ANUSHAKA	B.Sc.III	
81.	HIMANI	B.Sc.III	
82.	HINUJA	B.Sc.III	
83.	ISHITA	B.Sc.III	
84.	KRITIKA BAKSHI	B.Sc.III	
85.	PRACHI SHARMA	B.Sc.III	
86.	NEHA KAUNDAL	B.Sc.III	
87.	PUNAM SAINI	B.Sc.III	
88.	TEJASWANI KANWAR	B.Sc.III	
89.	VIJETA	B.Sc.III	
90.	YASHA DOGRA	B.Sc.III	

Convener

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Attendance Sheets