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School of Biological Engineering and Sciences

Student-Centric Methods

Introduction:

At the heart of modern education lies a transformative shift from traditional, instructor-led teaching toward a dynamic, student-centered learning model. In the discipline of Biological Engineering and Sciences, where innovation, interdisciplinary integration, and real-world application are essential, this paradigm shift is not only timely but imperative. Our vision is to create a vibrant, inclusive, and empowering learning environment where Biological Engineering students become active participants, co-creators, and problem-solvers. We aim to cultivate self-directed learners who possess not only strong technical acumen but also the ethical grounding, collaborative mindset, and adaptability to lead advancements in microbiology, biomedical systems, and environmental solutions. Our emphasis has been placed on project-based learning, peer teaching, flipped classrooms, and problem-solving sessions, in alignment with NEP 2020 recommendations.

The following student-centric methods are practicing in School of Biological Engineering and Sciences:

1. Experiential learning:

Experiential learning is a transformative educational approach based on the principle that students learn best through experience, reflection, and application. At Shobhit University, Gangoh, experiential learning is integrated into the curriculum to bridge the gap between theoretical knowledge and practical application. It empowers students to engage actively in real-world challenges, develop problem-solving skills, and internalize knowledge through direct involvement.

MEGISTRUM DE PROPERTIES DE PRO



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2.Integrated/Interdisciplinary Learning:

Integrated or Interdisciplinary Learning refers to an educational approach that transcends traditional subject boundaries to address complex issues, foster innovation, and nurture holistic understanding among learners. This method aims to blend knowledge, methodologies, and perspectives from multiple disciplines to solve real-world problems or explore broad themes in a more meaningful context. Aligned with the **National Education Policy** (NEP) 2020, this approach supports the development of 21st-century skills including critical thinking, creativity, collaboration, and communication. It encourages learners to make connections across domains, thereby enhancing cognitive flexibility and academic depth.

3. Participatory learning

Participatory Learning is an educational approach that emphasizes active involvement of students in the learning process through collaboration, discussion, dialogue, decision-making, and experiential input. This method shifts the traditional "teacher-centered" model to a more dynamic, student-centered approach, where learners become co-creators of knowledge rather than passive recipients. Participatory Learning aligns strongly with the National Education Policy (NEP) 2020, which calls for fostering critical thinking, creativity, holistic development, and meaningful engagement. It is particularly effective in higher education settings as it builds social, cognitive, and emotional skills and promotes learning through real-life context, peer interaction, and reflective practices.

4. Problem-Solving Learning:

Problem-Solving Learning, according to biological engineering perspective is an approach that emphasizes tackling real-world biological challenges through analytical thinking and structured problem-solving techniques. It encourages students to engage with authentic biological case problems, fostering discussion and reinforcing learning. At the institution, problem-solving is a core philosophy, preparing students to understand, analyze, and solve complex biological and engineering problems. Similarly, courses in biological engineering integrate computational tools, such as the state of the students with the skills needed to address biological and medical challenges.



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5. Self-directed learning:

It is an educational approach where students take initiative in identifying their learning needs, setting goals, and determining strategies to acquire knowledge. It fosters autonomy, self-motivation, and critical thinking, allowing learners to explore complex biological and engineering concepts independently. In biological engineering, SDL is particularly valuable as it encourages students to engage with emerging technologies, conduct independent research, and apply problem-solving skills to real-world challenges. Institutions emphasize SDL to prepare students for lifelong learning and adaptability in rapidly evolving scientific domains.

6.Patient-centric and Evidence- based learning:

Patient-Centric Learning is an educational approach that focuses on the patient as the central figure in the learning process. It emphasizes understanding patients' needs, preferences, values, and experiences to deliver personalized care. This method engages students by involving them directly with real or simulated patients, encouraging empathy, communication skills, and practical problem-solving. Patient-Centric Learning places the patient's experience and individuality at the core of student learning, fostering empathy and practical skills in real-world care. Evidence-Based Learning empowers students to use current, validated research to inform their clinical decisions, promoting effective and up-to-date practice. Both methods are highly student-centered because they require active engagement, critical thinking, and reflection essential for preparing competent, compassionate professionals in healthcare and related fields.

7. Project-Based Learning:

Project-Based Learning (PBL) is an instructional approach that actively engages students in exploring real-world problems and challenges through projects. Instead of passively receiving information, students take charge of their own learning by investigating, collaborating, and creating tangible outcomes or presentations. This method centers learning around students' interests, promoting deeper understanding and practical skills. Project-Based Learning transforms students from passive recipients into active creators of knowledge. It encourages



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inquiry, collaboration, and real-world problem-solving, making learning meaningful, dynamic, and student-centered.

8. Role Play Learning:

Role Play Learning is a student-centric teaching method that involves learners acting out scenarios to explore real-life situations, solve problems, and understand different perspectives. It is widely used in education, training, and development because it fosters active learning, critical thinking, empathy, and communication skills. It is a dynamic, student-centered method that turns passive learners into active participants. By simulating real-life situations, students not only grasp theoretical knowledge better but also develop the soft skills essential for success in school, work, and life. It empowers students to engage actively in real-world challenges, develop problem-solving skills, and internalize knowledge through direct involvement in the following activities.

9. Humanities in Learning

Student-Centric Methods in Humanities Learning focus on placing students at the heart of the educational process. These approaches emphasize critical thinking, inquiry, creativity, dialogue, and empathy, encouraging learners to actively engage with content, ask questions, and connect ideas to real-world experiences. The goal of humanities is to understand human experience, analyze culture, and question values, identities, and beliefs. Student-centric methods in humanities learning shift the focus from delivering information to cultivating interpretation, dialogue, and critical engagement. They turn classrooms into spaces where students explore human stories, analyze culture, and develop as thoughtful, ethical citizens.

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2024-25



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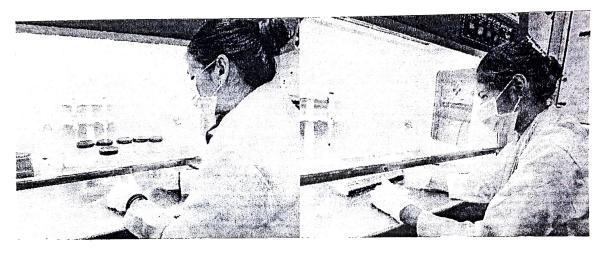
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School of Biological Engineering and Sciences

Student-Centric Methods

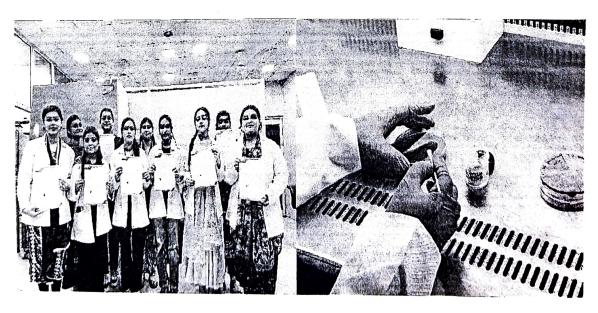
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Experiancial Learning



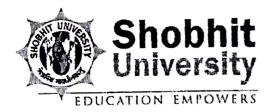
1) Internship Lab work

2) Lab Work



3)Collaborative work





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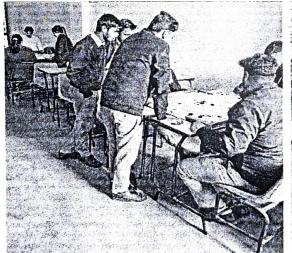
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Integrated/Interdisciplinary Learning





1) Microbiological Work



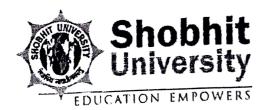
2) Culture of microbes



3) Playing Carrom

4) winning trophy in race event





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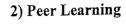
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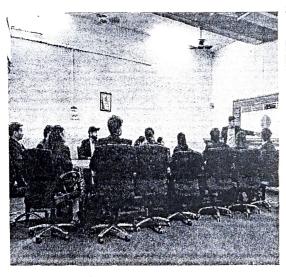
Participatory learning





1) Group Discussion



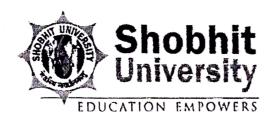




3)Student seminar

4) Curriculum participation

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Problem-Solving Learning:



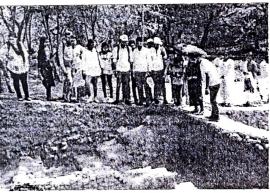


1)Laboratory based research work

2) simulation of inoculum



1)Field survey



2) Field analysis work





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Self-directed learning





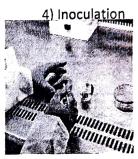












5)Research work

6) Internship

7) Research work

8) Plating





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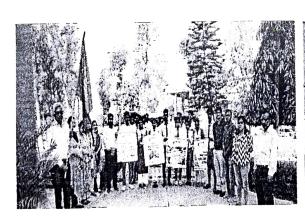
Patient-centric and Evidence- based learning





1) Social Work

2) Counseling session

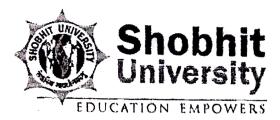


3) Awareness Programme



4) Blood donation camp

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5) Student Field survey

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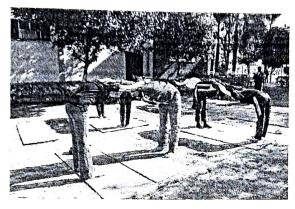


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Project-Based Learning





1) Yoga



2) Debate



3) Orientation program

4) Seminar

Signature and Verification

Prepared by:

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Dr. Vinay Kumar
Assi Verified Byrssor & Head
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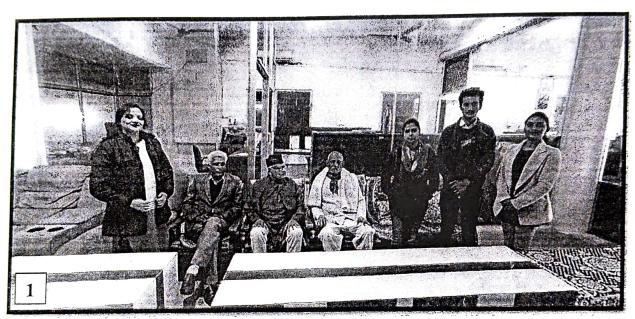
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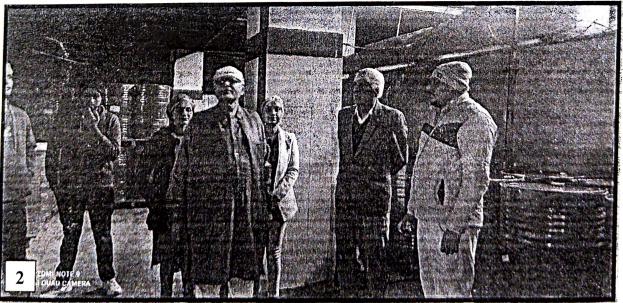
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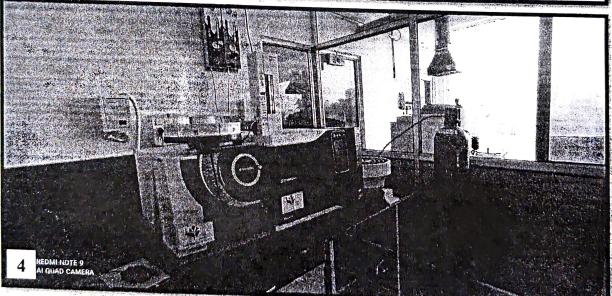




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IMG: Field Visit to Hi-tech Natural Products India Pvt. Ltd. Company





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IMG: Products of the visited company Hi-tech Natural Products India Pvt. Ltd.





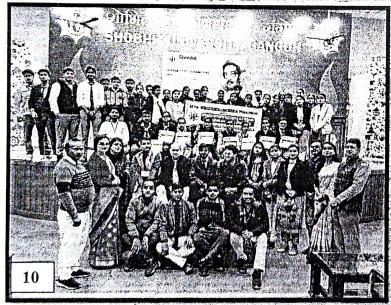


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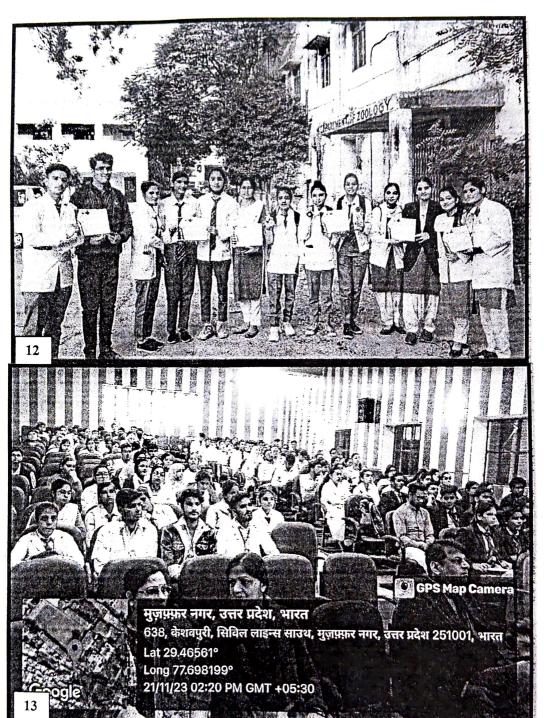
IMG: 2 Days National Workshop cum Hands on Training Program

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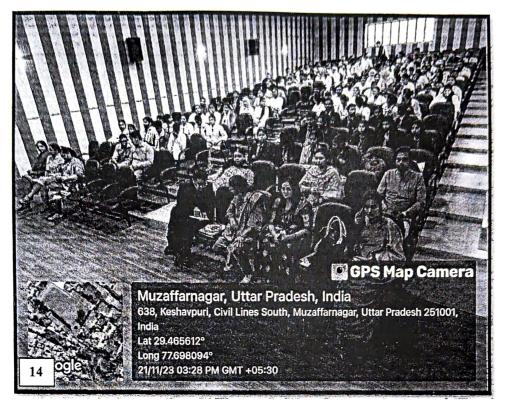




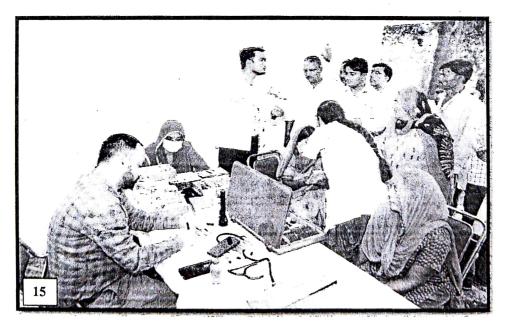
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IMG: Collaborative Work with DNA Labs & DAV College, Muzaffarnagar

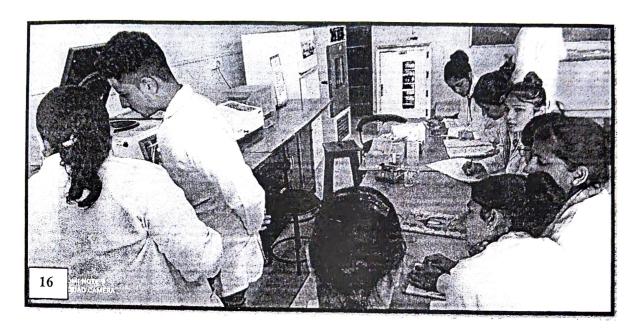


IMG: Comprehensive Health Care Program * Saharanpu



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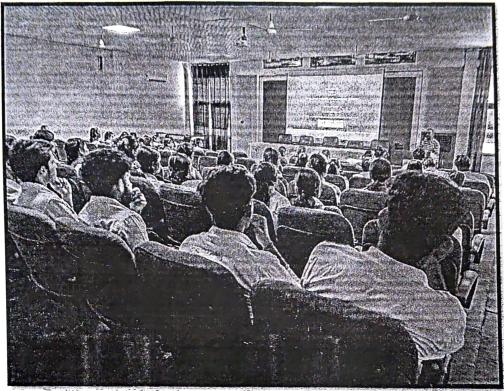
IMG: Laboratory Practicing





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IMG: Seminar organized by SBES on Training, Project & Dissertation Projects

- > Group Discussions and Debates
- > Student Seminars and Paper Presentations
- > Field-Based Learning and Rural Immersion
- > Peer Learning
- > Participatory Curriculum Development and Feedback
- > Project-Based and Problem-Based Learning
- > Student Participation in Institutional Governance
- > Extension Activities

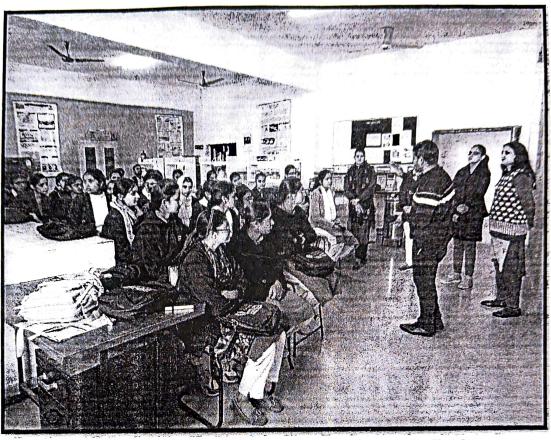




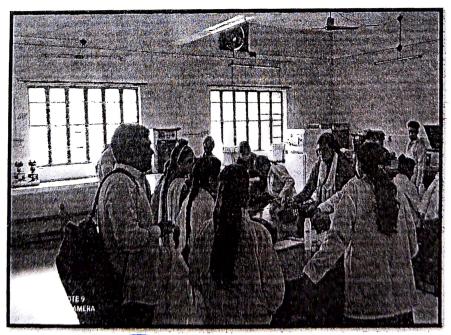
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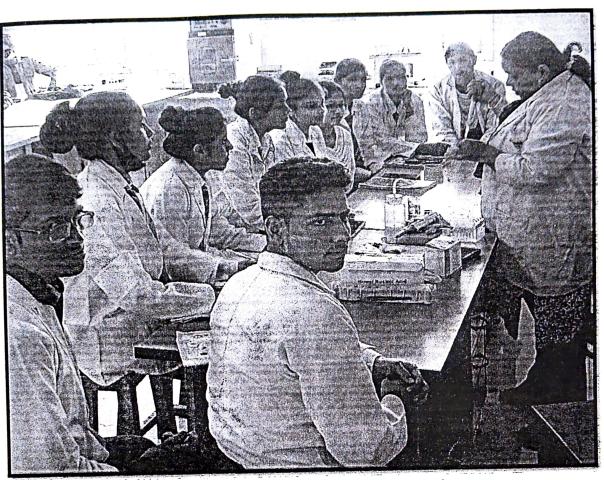
ERSITING: Group Discussions

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IMG: Project-Based and Problem-Based Learning





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IMG: Laboratory-Based Research Projects







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Course Work

Resources

Quizzes

Assignments

Students

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Course Work

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Quizzes

Assignments

Gradebook

Students

Course Planner

Create Sessions in Bulk

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A Session 2 - Antibiotics & Synthetic Microbial agents

Session 3 - Antifungal antibiotics

[2] Session 4 - Antiviral

▲ Session 5 · Chemical disinfectants, antiseptics and

Unit-II - Mechanism of action of antibiotics

Half.III . Pharmaceutical Products

Oallymod) 25/d Jan 20/5 ! Thursday 11,00 am to 12 00 pm

Take Attendance

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[A] Introduction to Pharmaceutical Microbiology (In Class)

Pharmacoutical microbiology is the application of microbiology to pharmacoutical and healthcare environments. It invo lives the study of microorganisms associated with the manufacture of pharmaceuticals, such as minimizing the number of microorganisms in a process environment, excluding microorganisms and microbial byproducts like explorin and on detexin from water and other starting materials, and ensuring the finished pharmaceulical product is sterile. It is a bra nch of microbiology that focuses on all aspects of pharmacy, especially as it relates to the manufacture and quality co ntrol of pharmaceuticals such as drugs, vinceines, and medical devices

Resources

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IMG: Blended Learning



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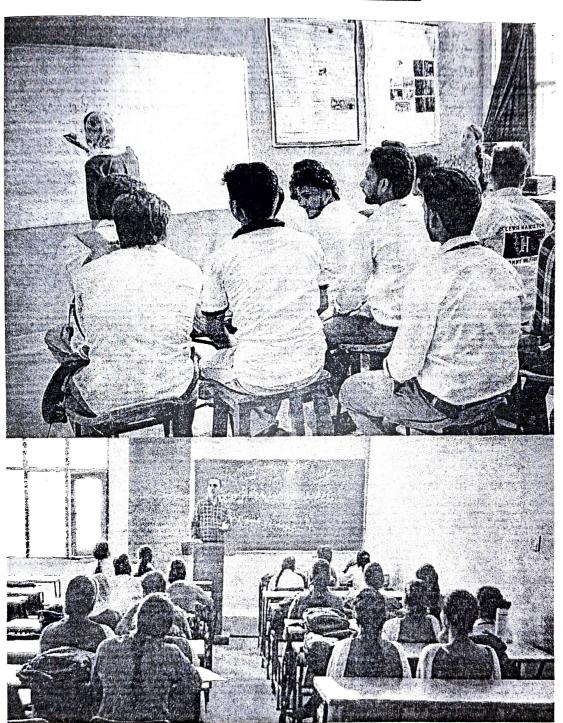
IMG: Research Based mini internship





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IMG: Teacher-Student Classroom Scenarios

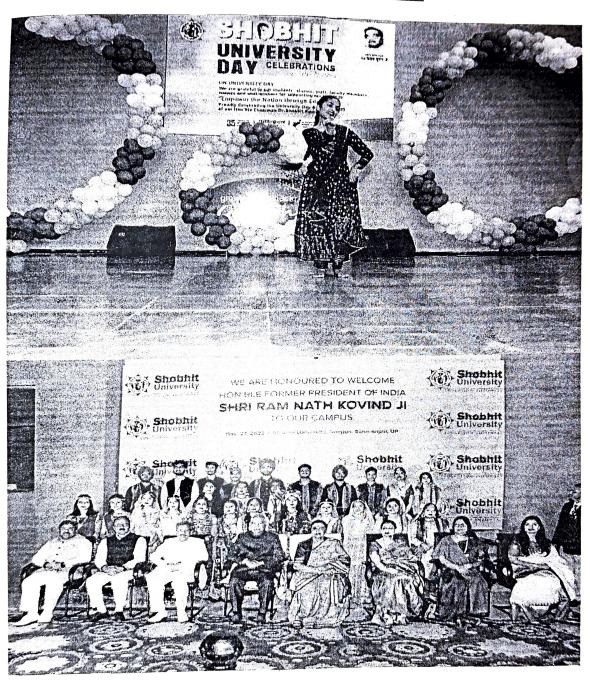




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IMG: Arts and cultural workshop

Signature and Verification

Prepared by:

Name: Squali R

Designation: Age

Date: 16 | 16 | 20

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Dr. Vinay Kumar Kofessor & Head LEngineering &