Shri Shivaji Education Society's,
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Programme Outcomes for Add-On Course: Synthesis of Metal Nanoparticles

1. **Fundamental Understanding of Nanotechnology**
   - Gain foundational knowledge about nanotechnology, with a focus on the synthesis and application of metal nanoparticles.
2. **Knowledge of Synthesis Methods**
   - Learn various synthesis techniques, including chemical, physical, and green synthesis methods, for fabricating metal nanoparticles.
3. **Control of Nanoparticle Properties**
   - Understand how to manipulate and control nanoparticle size, shape, and surface properties for specific applications.
4. **Material Characterization Techniques**
   - Gain expertise in using advanced characterization tools such as Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM), X-ray Diffraction (XRD), and UV-Vis Spectroscopy.
5. **Application in Multidisciplinary Fields**
   - Explore the diverse applications of metal nanoparticles in medicine, electronics, environmental science, and catalysis.
6. **Sustainable and Green Synthesis**
   - Understand eco-friendly and sustainable approaches to nanoparticle synthesis using plant extracts, microorganisms, and other biological agents.
7. **Understanding Chemical Reactivity**
   - Learn the principles of nanoparticle stability, aggregation, and functionalization for targeted applications.
8. **Nanoparticle Toxicity and Safety**
   - Assess the environmental and biological impacts of metal nanoparticles and learn safe handling practices.
9. **Hands-On Experimental Skills**

- Develop practical skills in laboratory settings for synthesizing and testing metal nanoparticles.

10. **Data Analysis and Interpretation**
    - Build expertise in analyzing experimental data and interpreting results to draw meaningful conclusions.
11. **Research and Development Competencies**
    - Prepare for research roles by gaining skills in experimental design, hypothesis testing, and project documentation.
12. **Industrial Applications**
    - Understand the use of metal nanoparticles in industries such as pharmaceuticals, cosmetics, water purification, and energy.
13. **Interdisciplinary Collaboration**
    - Work collaboratively with experts in chemistry, physics, biology, and engineering for nanoparticle-based projects.
14. **Innovation and Problem-Solving**
    - Learn to apply nanoparticle synthesis techniques to solve real-world challenges, such as drug delivery and pollution control.
15. **Ethical and Responsible Nanotechnology**
    - Gain awareness of the ethical and regulatory aspects related to the production and application of metal nanoparticles.
16. **Career and Academic Growth**
    - Prepare for advanced studies, research opportunities, or roles in industries focusing on nanotechnology and material science.
17. **Global Trends and Advances**
    - Stay updated on global advancements in the field of nanoscience and emerging trends in nanoparticle applications.

IQAC Coordinator
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