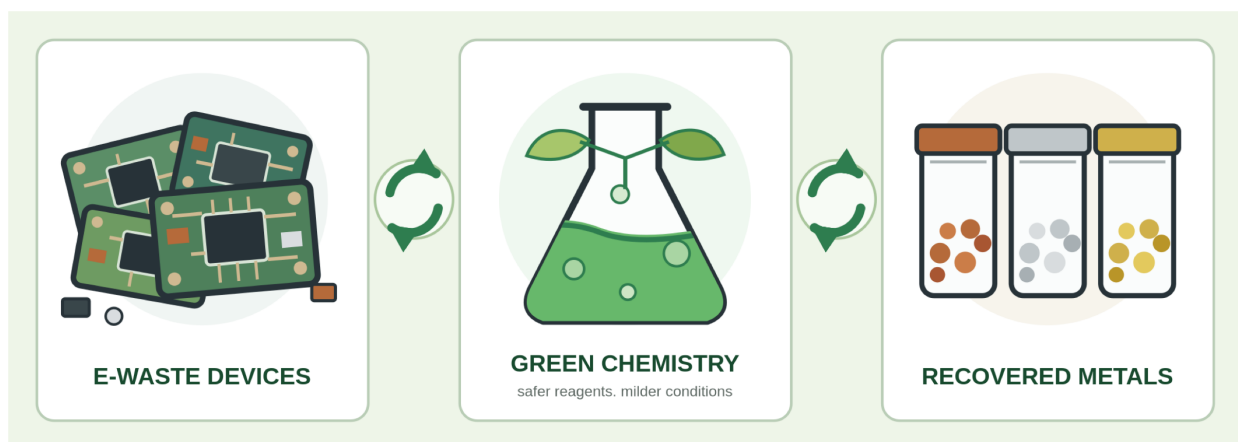




TWO UNDERGRADUATE RESEARCHERS WANTED | FALL 2026

Green Chemistry applied to E-Waste Recovery

Project: “Green Chemistry-Enabled Selective Resource Recovery from Electronic Waste”

Dr. Nadya Zyaykina, Research Assistant Professor in SEE, is seeking two undergraduate students to contribute to the research project through EEE 49800 Independent Study.

OPENINGS	RESEARCH CREDITS	TERM	COMMITMENT
2 students	3 credits each	Fall 2026	About 10 hrs/week

WHY THIS PROJECT MATTERS: Small electronic devices contain valuable base, precious, rare, and critical metals. Traditional recovery technologies use harsh chemicals and high energy demanding. This project explores safer, more resource-efficient chemical routes that reduce process burdens while recovering useful materials.

WHAT YOU'LL INVESTIGATE

- Optimize ligand-assisted oxidative leaching using green ligands such as citrate, malate, or oxalate.
- Maximize selective recovery while limiting co-dissolution, ligand degradation, water use, and energy demand.
- Test whether extraction performance and product purity can be maintained through repeated recovery and solution-reuse cycles.

WHAT YOU'LL DO

- Prepare representative small e-waste feedstock and characterize it using acid digestion followed by ICP-OES analysis.
- Conduct controlled batch trials, vary chemical dose and operating conditions, and use appropriate controls and replicates.
- Analyze filtrates and residues to calculate yield, selectivity, product purity, and full metal mass closure.

WHAT YOU'LL GAIN

- Hands-on experience in safe e-waste preparation, oxidative leaching, solid-liquid separation, and instrumental analysis.
- Introduction to experimental design, quality control, data interpretation, and mass balance determination.

ONE PROJECT, TWO STUDENTS: The students will address different aspects of the same project while earning three research credits each through EEE 49800.

INTERESTED IN GREEN CHEMISTRY, CIRCULAR MATERIALS, AND HANDS-ON LAB RESEARCH?

Contact Dr. Nadya Zyaykina at nzyaykina@purdue.edu to learn more!

Provide your professional resume and your motivation letter. Apply ASAP for Fall 2026.