

MTSU Sustainable Campus Fee Funding Request Form

The Sustainable Campus Fee (SCF) supports projects that advance sustainability at MTSU. This form allows students, faculty, and staff to propose initiatives that contribute to a greener campus through energy efficiency upgrades, infrastructure improvements, education, research, and efforts to enhance campus biodiversity.

There are 5 sections to the application: Section I: Contact Information, Section II: Project Category, Section III: Project Description, Section IV: Project Cost, and Section V: Project Performance Information (For applicable projects).

The Sustainable Campus Fee is administered through a partnership with the Office of Student Affairs, the Center for Student Involvement & Leadership, and the Center for Energy and Sustainability (CES).

Date Wednesday, September 30, 2026

Request Number **SCFR27000101**

1. Name Ngee-Sing Chong

Email nchong@mtsu.edu

Phone Number (615) 898-5487

SECTION II: Project Category

Please note that all proposed projects will have to comply with MTSU campus guidelines and recommendations.

1. Select the category that best describes the project. (Select One - See Descriptions Below)

Research and Innovation

CATEGORY DESCRIPTIONS

Energy Conservation/Efficiency - (e.g. installing LED light bulbs, adding insulation to walls, replacing old appliances with energy-efficient models, installing programmable lighting, etc.)

Renewable Energy - (e.g. implementing projects to harness naturally replenishing sources like wind, water, and sunlight to generate electricity - like solar-powered picnic tables, etc.)

Sustainable Transportation - (e.g. installing covered bike racks, replacing fuel vehicles with electric vehicles, etc.)

Alternative Fuels - (e.g. setting up electric vehicle charging stations, implementing hybrid or electric vehicles, purchasing electric or propane power equipment, etc.)

Recycling - (e.g. purchasing recycling bins, improving signage, recycling difficult materials, etc.)

Waste Reduction - (e.g. establishing a reuseable to-go container program, reducing food waste, installing waterbottle filling stations, etc.)

Water Conservation - (e.g. purchasing rain barrels, creating a rain garden, switching to low-flow water fixtures, installing low-flow water valves, etc.)

Biodiversity - (e.g. planting pollinator garden, tree planting, installing bird boxes, etc.)

Education - (e.g. hosting a sustainability fair to raise awareness about green practices, hosting bike repair and/or safety workshops)

Research and Innovation - (e.g. researching the effects of microplastics, solar feasibility study, etc.)

SECTION III: Project Description

Please include as much detail as possible in this section. The more information you provide, the better equipped the adjudication committee will be to fully understand your request and make an informed decision.

To expand a text box, click and drag the two diagonal lines in the bottom-right corner. This allows you to adjust the size and view of your content as you type.

1. Project Title

Design and Testing of Sorbent Traps for Capturing Toxic Chemicals in General Chemistry Laboratories

2. Scope: Work to be accomplished

Different ion exchange resins (four types) and carbon-based materials (three types) will be evaluated in different combination ratios for removing chemical wastes generated from chemistry laboratories serving close to 1700 students per year. This will significantly reduce potentially harmful chemicals from being flushed down the drains and also reduce the volume of waste requiring fee-based disposal by commercial waste disposal companies. This will also alleviate the burden for local wastewater treatment facilities to remove heavy metals with neurotoxicant effects, carcinogenic compounds, endocrine disruptors, persistent organic compounds like polycyclic aromatic hydrocarbons and per/poly-fluoroalkyl substances (PFAS), as well as chemicals with other adverse human and ecological health effects. This project resonates with the goals and missions of the Green Chemistry Institute of the American Chemical Society and the US Environmental Protection Agency's regulatory framework.

3. Scope: Benefit Statement

This will reduce the cost of disposal for the chemistry department at MTSU. According to AI, the average expenditure by chemistry departments across the United States is \$15,000-\$50,000 for small to mid-size universities. I intend to pursue this research with the goal of filing provisional patents the help of MTSU College of Graduate Studies (CGS) and Mr. Richard Neff who is the MTSU Commercialization Counselor. If successful, this sorbent trap technology can be licensed to a manufacturer for mass production and sales to academic and industrial laboratories. This will allow the MTSU Sponsored Programs Office of CGS to collect royalties from the manufacturer. The benefits of this research also applicable to MTSU students pursuing research with Dr. Chong. The genesis of this research idea for sorbent trap originate from work done by three high school students from Central Magnet School. These students received invaluable research training at MTSU and were supported by Dr. Chong's recommendation letters for college applications with subsequent admission offers from and matriculation at the California Institute of Technology, Princeton University, and Vanderbilt University.

4. Location of Project

MTSU Chemistry Department on the third floor of the Science Building

5. Participants and Roles

Dr. Ngee Sing Chong, Dr. Richard Nagorski (Chair), and other chemistry professors in charge of teaching laboratories.

6. Student Participation in the project and/or Student Benefit from the project

Besides the three high school students mentioned above, MTSU student, Mari Shields, has been awarded a URECA grant to pursue the sorbent research with me in the 2026-27 academic year. Mari will benefit from

this research experience to pursue a career in scientific communication or laboratory analysis.

7. Future Operating and/or Maintenance Requirements

Chemistry Department will provide additional funds to support this research with the major budget request coming from the MTSU Sustainable Campus Fee (SCF) Program.

8. Additional Comments or Information Pertinent to the Proposed Project

This research project will be carried out by Mari Shields under Dr. Chong's supervision for this academic year. Depending on the commercial interest for the sorbent chemistry research, it can continue into the next academic year. SCF funding amount is based on the needs for the current academic year only. If funding is needed for the 2027-28 academic year, either a separate SCF request will be submitted or funding from external sources will be sought.

Any supporting documents or attachments will be on the pages following the SCF Request.

Note, all projects are expected to be completed by December 31, 2026.

SECTION IV: Project Costs

1. Project Cost Estimate 7000

2. Source of Estimate

Sigma Aldrich, Oakwood, AccuStandard, ChemService catalogs for various ion exchange resins and carbon-based materials such as activated carbons and multiwalled carbon nanotubes. Raw biomass ingredients such as chestnut shells and pistachio shells will also be processed into functionalized carbon-based sorbents with other treatment methods requiring both chemicals and other consumables for chemical analysis.

3. Has previous funding from this source been awarded?

No

If Yes, please explain how this request differs from previous funding request.

SECTION V: Project Performance Information

If your project is expected to reduce energy consumption (e.g. through lighting upgrades or HVAC improvements etc.), please provide an estimate of potential savings. Feel free to contact the Center for Energy and Sustainability for help making these calculations at ces@mtsu.edu.

1. Estimated Annual Energy Savings (Estimated in kW, kWh, Btu, etc.)

Not applicable. Electrical energy is not needed in the use of the sorbent traps for removing chemical wastes.

2. Annual Energy COST Savings (\$)

Not applicable.

3. Annual Operating Cost Savings or Other Cost Savings. Specify in dollar amount, if applicable. (\$)

Not applicable.

4. Matching or Supplementary Funding (Identify and explain, if applicable)

\$300 from the URECA grant award to Mari Shields for purchasing chemicals; Chemistry Department for research supplies if students are enrolled in the CHEM 2880/3880 Chemistry Research courses.

Acknowledgment

I acknowledge that a project summary and photo must be submitted, if I am awarded funding and upon completion of the project.

Supporting Documentation or Attachments if provided.
