



Transformative Research in Urban Sustainability Training (T-RUST)

What is T-RUST?

T-RUST is an innovative graduate training program at Wayne State University that integrates social and physical science, technology, engineering, and mathematics in an effort to tackle complex challenges in urban sustainability. T-RUST aims to train students using integrated scientific, engineering, and social science approaches combined with innovative policy-making in an effort to foster innovation in urban sustainability.

Our Vision

Transformative research in urban sustainability will train STEM doctoral and masters students from multiple disciplines to work together and with local communities, businesses, industries, scientists, and policy makers to understand and address challenges faced in post-industrial urban settings. T-RUST students will evaluate natural and engineered urban environments while communicating policy and management options related to particularly challenging environmental problems that the physical sciences cannot resolve alone.



Goals

Science Leadership

Educate PhD and MS students to make important contributions to urban environmental system research, policy making, and multidisciplinary problem solving.

Curriculum Relevancy

Develop a curriculum for our science leaders to meet the needs of the labor market in urban sustainability.

Community Impact

Effectively address local urban sustainability problems through a multidisciplinary lens.

Broader Applicability

Generate knowledge that has applicability in other urban settings.

STEM Recruitment Pipeline

Recruit students that fulfill the need to educate students of underrepresented minorities.

Program Sustainability

Develop a self-sustaining program that thrives beyond the life of the grant funding period.

Contact Us

Wayne State University
5047 Gullen Mall, Detroit,
Michigan 48202
Phone: 313-993-1323
Email: trust@wayne.edu
Web: trust.wayne.edu

Research Themes

Urban Ecological Systems

The evaluation and maintenance of ecosystem services requires the integration of natural science, social science, and engineering-based environmental studies with community and education outreach research projects to sustain the urban ecological systems upon which quality of life depends.

Urban Redevelopment and the Blue Economy

From land use and urban re-design, to global supply-chain and behavioral economics, and sociological and natural systems that make cities healthy and vital places, this research track unites social and physical sciences with engineering and design for spatially and socially integrated solutions. Studies of the “Blue Economy” are particularly relevant for cities with waterfronts that are reinventing themselves.

Sustainable Urban Water Infrastructure

Analysis of the natural, engineered, and societal systems that have formed the current water infrastructure of Detroit will provide students the foundation for understanding the complex inter-relationships and progressive solutions for sustainable urban infrastructure. Specialties within this track will include drinking water treatment and distribution, wastewater management, and the use of big data and sensor technologies in decision-making for improved infrastructure sustainability.

Collaborations

T-RUST program leadership by faculty across Wayne State is informed by an advisory board of community leaders from government, industry, social impact organizations and academic institutions. Collaborators provide mentorship and guidance for student internships, research projects and community service activities. Board members also provide input and participate in seminars, colloquiums and curriculum development to ensure the program meets its goals.

Departments

- Anthropology
- Biology
- Communication
- Economics
- Education
- Engineering
- Environmental Health Sciences
- Geology
- Pharmaceutical Sciences
- Pharmacology
- Urban Planning

Trainee Competencies

Problem Definition

- » Critical Thinking
- » Understanding Across Disciplines & Regions
- » Conceptualizing & Framing

Research Methods

- » Question Development
- » Research Design
- » Data Collection Design
- » Protocol Implementation
- » Multidisciplinary Analytical Method Application
- » Ethical Conduct in Research

Communication

- » Research Findings & Implications Across Disciplines
- » Research Applicability to Societal Demands for Sustainability

Problem-Solving

- » Multidisciplinary Analytical Techniques
- » Application of Concepts
- » Interdisciplinary Problem-Solving
- » Identification of Viable Solutions

Collaboration

- » Active Interdisciplinary Teams
- » Uniting Around Concepts from Different Fields of Study
- » Effective Community Engagement
- » Leadership Empowerment

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