



MSU RESEARCH FOCUS AREAS

MSU is the state's leading research university, with research strengths across all colleges and research centers that have led to the institution being the only Mississippi university categorized as a Carnegie Very High Research University. In planning for the future, the university must be strategic in the approach taken to future research investments. Based on existing strength areas and identified future opportunities, priority areas have been identified and will be used in directing future investments such as new faculty hires, infrastructure development, and resource allocation.

Environment and Energy

- **Energy and Sustainability** - Development of new energy sources, alternate forms of energy, feedstock development, advances in clean energy, innovation in energy acquisition (e.g., new fossil fuel extraction techniques), green technologies, demography, and the development of environmentally and economically sustainable energy sources, both regionally and nationally.
- **Water** - Conservation, development, management, and use of water resources to assist planning and regulatory bodies at the local, state, regional, and federal levels, water conservation and use planning and management, development of best management practices for water protection and conservation, development and demonstration of novel and innovative treatment technologies and approaches for small public drinking water systems, and safety of water resources.
- **Food and Fiber Production and Safety** - Biofuel feedstocks, sustainability and environmental stewardship, enhanced agricultural and forest productivity, agricultural history and policy development, food distribution systems, anti-terrorism strategies related to food safety, food-borne diseases, and the distribution of and access to food supplies.
- **Natural Resources and Environmental Sustainability** - Sustained harvest of renewable natural resources; conservation of ecosystems and the myriad services they provide; and mitigation and adaptation to change, enhance quality of life, stimulate economic activity and support essential ecological functions for the residents of Mississippi, the region, and the nation.

Health and Education

- **Health and Education Disparity** - Better understanding of the root causes for health and education disparity, mitigating strategies, quality of life improvements, curriculum development and delivery, and quality of life initiatives; access to goods (including food), mental health, and services and education for minorities or disadvantaged

populations whether ethnic, socioeconomic, cultural, disabilities, linguistic, race and gender.

Knowledge Management Systems

- **Data to Decisions** - Computational biology, information analysis, human machine interaction, data sharing, cognitive science, correctness of data, socio-economic analysis, and modeling the decision process.
- **Homeland Security** - Critical infrastructure protection and monitoring (e.g., water, power, emergency services, financial/economic, communications), remote and in situ sensor systems, public policy, communications and cyber security, transportation system monitoring, law enforcement support, first responder training, natural disaster response and recovery.
- **Public Policy** - A purposive and consistent course of action as a response to a perceived problem of a constituency (stakeholder-citizens/voters, political reps), created by a specific political process, and adopted, implemented, and enforced by a public agency.

International Development

- **International Development** - Enhancement of quality of life for citizens in a specific region or country, improved public services, increased food production and security, increased national security, disease mitigation strategies, and technology development and adoption.

Mobility Systems and Materials

- **Mobility Systems** - Transportation systems (air, sea, and land based). Research topics within this area would include transportation planning, safety, and security, unmanned aircraft systems development and utilization, transportation policy, military transport systems, automotive, human factors research applied to mobility systems, ergonomics in transportation systems, robotics, and modeling/simulation of mobile systems. It also encompasses physical transportation of goods and people, and system optimization for improved transportation infrastructure.
- **Material Sciences and Engineering** - Understanding the relationship between the structure of materials at atomic or molecular scales and their macroscopic properties, nanoscience and nanotechnology, fundamental properties and characteristics of materials, bio-based design, metallurgy, forensic engineering and failure analysis, composite materials, and polymers.