

Morgan State University Capabilities

Morgan State University, founded in 1867, is one of the nation's premier Historically Black Colleges and Universities (HBCUs). It has the unique designation, by legislative statute, as Maryland's Preeminent Public Urban Research University. Morgan is a Carnegie classified Doctoral University Research Activity (R3). With a diverse student population of around 8,000, the University offers a comprehensive program of studies at the undergraduate and graduate levels.

It confers an average of more than 800 degrees annually in more than 35 fields. At the graduate level, it awards doctoral and master's degrees in several selected fields. Programs awarding the doctorate include Bio-environmental Sciences, Engineering (civil, electrical, industrial and transportation), Business Administration, Industrial and Computation Mathematics, Mathematics Education, Science Education, Higher Education Administration, Community College Leadership, Urban Educational Leadership, English, History, Psychometrics, Public Health, and Social Work.

Morgan State University has made a major commitment to academic excellence, and has invested substantial resources in recent years to enhance its research infrastructure, and stimulate research development in a broad range of disciplines. Led by world-class scientists and technicians working in state-of-the-art facilities, MSU's research capabilities in the sciences are distributed among the following:

Biology:

- HIV/AIDS; Bioinformatics
- Neurodevelopment/neurodisorders
- Molecular and developmental genetics
- Environmental toxicology
- Environmental microbiology

Chemistry

- Polymerization reactions and microgravity
- Analytical sensors for monitoring pollutants and biological activity
- Synthesis of fluorescent dyes and conductive polypropylene polymers for biosensors
- Development of near infrared dyes for use in biological sensors and inorganic compounds for use in cancer treatment
- Computer modeling; Bioinformatics

Computer Science

- Artificial intelligence;
- Computer modeling Computer engineering; Bioinformatics
- Computational sciences, Information Assurance

Mathematics

- Nonlinear functional analysis
- Free boundary problems in fluid mechanics
- Almost automorphy and almost periodicity

Physics

- Image processing and digital signal and applications to biology and medicine, Mathematical modeling
- Nanotechnology and its applications
- Mossbauer spectroscopy
- Condensed matter physics
- Acoustics and inverse problem theory
- Magnetic thin films; Bioinformatics

Electrical and Computer Engineering

- Development of advanced engineering visualization tools and courseware, Virtual reality and biomedical instrumentation
- Microelectromechanical systems (MEMS) research
- Microwave electro thermal micro propulsion systems
- Geo-spatial reasoning methods for aircraft synthetic vision systems

Civil Engineering

- Adaptive structures and control technology
- Analytical and numerical modeling of land
- Remediation of biological warfare agents
- Earthquake resistant structures
- Analytical and experimental studies of adaptive retrofits to bridge girders
- Development of counter-rotating fly-wheel actuators

Industrial Engineering

- Smart structures and active structural control for vibration suppression
- Embedded sensors and actuators.
- Human factors psychology and social marketing
- Robotics & automation
- Routing and scheduling manufacturing systems
- Laser-based diagnostic instrumentation
- Reliability Engineering and Risk Assessment

Transportation and Urban Infrastructure Studies

- Traffic and highway engineering
- Planning and management and logistics

Community Health and Policy

- Behavioral Health Sciences
- Public Health Analysis
- Health Policy and Management

Centers & Institutes

MSU Centers & Institutes are important cross-disciplinary efforts that address research and manufacturing challenges too complex for single-investor programs. These Centers & Institutes provide focal points for the development and transfer of new technologies, processes and equipment in a cooperative environment with industry, academia and foundations.

Patuxent Environmental and Aquatic Research Laboratory (PEARL)

Center for Chemical and Biological Sensors Development and Characterization

This center focuses on the development, synthesis and characterization of novel chemical and bio-analytical sensors.

Center for Advanced Microwave Research & Applications (CAMRA)

This centers focuses on research and technology developments and systems (amplifiers, mixers and LO's), and low power digital logic to support NASA's future Earth and Space Science missions.

Center for Advanced Energy Systems and Environmental Control Technologies (CAESECT)

Focuses primary emphasis is on the development of new technologies to improve energy utilization.

Center of Microwave /Satellite and Radio Frequency Engineering (COMSARE)

Research focus is on microwave device and circuit simulation, neural networks, electromagnetic simulation and software development.

Engineering Visualization and Semiconductor Characterization Group (EVSCG)

This center focuses on development of high performance 3D graphics visualization tools, characterization of electronic structures and devices, and investigation of methodologies for better understanding of the behavior of electronic devices.

Advanced Engineering Design and Manufacturing Center

The Center involves reconfigurable manufacturing systems and focuses on the ability to rapidly respond to market changes in product variety and production volume using machines, equipment, and information systems.

National Transportation Center (NTC)

The center undertakes studies to optimize and improve transportation systems management and development.

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