

Bowie State University Capability Statement

Institution: **Bowie State University**

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Certificates, Registrations, Accreditations: ***Middle States Commission, ABET, NCATE, National Center of Excellence for NSA & DHS.***

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OVERVIEW

Founded in 1865, Bowie State University (BSU) is a public comprehensive institution and the first Historically Black College and University (HBCU) established in the State of Maryland. With a population of over 6,100 students, BSU is committed to providing students with educational experiences that prepare them to successfully become future leaders and innovators in their field of interest. The University is also the site of the first Maryland business incubator to be established at an HBCU, the Bowie Business Innovation Center (Bowie BIC), which provides business support services and facilities that help companies survive and grow during their start-up period. A centerpiece of BSU's success lies in the area of science, technology, and education. The National Security Administration (NSA) and the Department of Homeland Security (DHS) has designated BSU as a Center of Academic Excellence in Information Assurance Education since 2011. In addition, to ensure that a higher number of students seek and complete advanced quality education in Science, Technology, Engineering, and Mathematics, a 149,995 square feet Natural Sciences, Mathematics and Nursing building opened in summer 2017, to support teaching and research in STEM. This state-of-the-art building includes 23 Science teaching labs, 15 classrooms, 6 science research labs, 6 shared flexible classroom spaces, 82 academic offices, an informal student gathering space, a greenhouse, and a nursing skills simulation suite.

RESEARCH CAPABILITIES

Biomedical Research/Biology: Bioinformatics, Botany, Aging effects on muscle mass; Plant Metabolomics, Physiology, Ecotoxicology; genetics; Plant Genomics, Germplasm Analysis, Research on special habitats, DNA Fingerprinting and DNA Barcoding

Chemistry: Organic/Synthetic Chemistry, Chemistry; design and synthesis of anti-cancer, anti-microbial and broad-spectrum anti-viral compounds; design and synthesis of biologically active small molecules with medicinal applications; developing imageable small molecules to be used for drug delivery

Mathematics/Computer Science/Information Systems: Security in wireless and data networks, parallel algorithms and high-performing computing, embedded systems, robotics, programming languages, data mining, intrusion detection, data privacy, artificial intelligence, machine learning, natural language processing and cognitive agents, operating systems, networks and software engineering, image processing, image compression, super resolution, neural networks, pattern recognition; application development and technology support services

Forensic Science: Security and forensics in small-scale, wireless, mobile devices, computer forensics and cybersecurity

Psychology/Behavioral Sciences/Social Services/Criminal Justice: clinical and health psychology, brain-based learning, bio-feedback and psychophysiological analysis of depression and anxiety disorders; comparison analysis of how learning occurs; social services and social work training and research for adults, children and families; program evaluation; criminal justice research and services, ex-offender services and training ; sexual assault prevention and victim advocacy services; alcohol and drug prevention services; HIV family services research; adult caretakers research

Business/Management Information Systems: financial market microstructure, marketing solutions and training, entrepreneurship, economic analysis, forecasting, and processing; international economics, safety and risk management, project management; business development training; web development, data analytics, and mapping services

FACILITIES

Autonomous Technologies Laboratory- The lab specializes in designing and developing algorithms and technologies geared towards improving the ability of both software systems and hardware components to perform autonomously in real time environments. Integration of both hardware and software components to create autonomous artifacts that can operate under different size, weight, power and time constraints is also a major thrust in the lab. Research in the lab fall under the broad fields of artificial intelligence, robotics and bioinformatics — including machine learning, data mining, image processing, natural language understanding, time-series analysis, knowledge representation, common sense reasoning, metacognition and sensor data integration.

Makers' Space- Stratasys uPrint SE Plus with Support Cleaning Apparatus, PrintrBot Simple with Heated Bed, Ultimaker 2, NextEngine Desktop 3D Scanner, Universal Laser Systems Desktop VLS 3.50 (Laser Cutter) with Fume Extraction Apparatus, General CNX iCarver 40-915X CNC with Stand, SMI Eyetracking System.

Virtual Reality Laboratory- This laboratory applies cutting-edge VR technology currently available in academia and industry. In addition, the lab allows robotics experimentation and research in Multi-agent systems for evacuation. The current projects in the Virtual Reality Laboratory focus on evacuation simulation, way finding, modeling emergency scenarios, virtual museum, Multi-user gaming environments, and online VR classroom.

Laboratory for Information and Infrastructure Security and Assurance- This laboratory provides students with state-of-the-art technology equipment and software to attack and defend target computer networks in a secure environment

Biotechnology Core Laboratory- DNA Microarray, global gene expression, cellular/ biological imaging & analysis, Quantitative Gene Express, Microarray Verification, Quality control and Assay Validation, Pathogen Detect, SNP Genotyping, MicroRNA Analysis, Viral Quantification through both Real-Time PCR and Thermal Cycle PCR.

Other Major & Specialized Instrumentation- Scanning Electron, Florescence, Infrared, NMR, UV/Vis Microscopy, High speed centrifugation, Particle Size Analyzer, Vector Network Analyzer, Flow Cytometer, Atomic Absorption Spectroscopy, GC-Mass Spectroscopy

SAMPLE CONTRACTS, COOPERATIVE AGREEMENTS AND GRANTS

NASA STEM Educator Professional Development Collaborative (Texas State University- Prime); NNX14AQ30A (9/1/2017-8/31/18) BSU Subaward (Dr. Florence Etop, Natural Sciences)

NASA Ground Systems and Mission Operations (GSMO II) (Peraton- Prime) BSU Subaward; NNG09DA01C Program Management Support (Space Network Engineering and Business) Subaward (Dr. Anika Bissahoyo, Research and Sponsored Programs)

The Small Bodies Node of NASA's Planetary Data System (UMCP-Prime) BSU Subaward from National Aeronautics and Space Administration; 9/30/15-9/29/20 (Dr. Bo. Yang, Computer Science)

A Multidisciplinary Approach to Infusing Data Science and Analytics into the Undergraduate Curriculum at Bowie State University from the National Science Foundation; 6/15/18 to 5/31/21 (Dr. LaTanya Brown-Robertson- Accounting, Fincance and Economics; Dr. Azene Zenebe- Management Information Systems; Dr. Eric Bonsu-Natural Sciences)

Army Research Laboratory Micro Autonomous Systems and Technology (MAST) Collaborative Technology Alliance/BAE Systems (Dr. Darsana Josyula) W911NF-08-2-004- inactive: Project provides remote sensing research and development support.