Central State University
Capability Statement

OVERVIEW:
Central State University (CSU) is an 1890 Land-Grant Institution and was established in 1887. CSU offers 39 baccalaureate programs through four colleges – Business (COB); Education (COE); College of Engineering, Science, Technology, and Agriculture (CESTA); and the College of Humanities, Arts, and Social Sciences (CHAS). Central State has an enrollment of about 5,300 students with a student faculty ratio of 19 to 1. Research expenditures for FY 21 totaled $8.75M.

RESEARCH CAPABILITIES:
Business: Agribusiness training and educational seminars. Robust internship program in collaboration private industry.
Education: Pedagogical theories integrated with supervised classroom clinical experiences.
Computer Science and Mathematics: Uncertainty quantification of multi-phase porous media flows on GPUs; Image processing and classification for agriculture.
Engineering: Hydro-energy applications for enhancing sustainable natural resources use; water quality in sustainable food production on urban landscapes; hydraulic models for water distribution and wastewater collection systems; ecosystem sustainment of regions under natural gas exploration; geospatial applications for environment; water quality in natural and man-made systems; Additive Manufacturing; Robotic Applications in Agriculture.
Life Sciences and Agriculture: Weed and crop disease management; farm productivity, conservation and sustainable utilization of natural products; education, exercise, nutrition, and health; obesity and diabetes; genomics underlying social behavior in bees; mite biting bees; epi-genomic mechanisms of paternal inheritance of aggression in social honeybees; crop production mechanized integrated pest management strategies; hemp and alternative crops for diversifying agriculture; optimal agronomic practices; tool for growers to predict sulfur deficiency in soils; AVIRUS imagery to map spatial variability of soil carbon.
Social Sciences: Community engagement and service by offering community music lessons; providing hands-on assistance at social service, criminal justice, and governmental agencies; undertaking social sciences and humanities research pertaining to historically underserved and minority populations; providing public interest programming via NPR affiliated WCSU-FM radio broadcasts and internet distribution; and professional work with local television, radio, and theatre organizations.

FACILITIES:
COB: Stock trading room, digital classrooms, and smartboards.
COE: Agricultural Education
CESTA: Green House; Cell culture laboratory, Molecular laboratory, Animal care facility, Analytical chemistry laboratory, Robotics laboratory, Additive manufacturing laboratory, Robotics laboratory, Machining and Instrumentation Laboratory, McLin Hydraulics Hydrology Laboratory, Advanced Water Quality Laboratory, Soils Laboratory, Air Quality Laboratory, GIS-Remote Sensing Laboratory, Honeybee Research Laboratory.
CHAS: WCSU-FM radio station, a psychological testing laboratory, and the Paul Robeson Performing Arts Auditorium.
SPECIALIZED EQUIPMENT: 15 m Armfield Open Channel Flume; Inductively Coupled Plasma Mass Spectrometer; Li-Cor LI -7900 Eddy Covariance Tower; Waters Analytical Supercritical Extractor; qPCR; GC – Mass Spectrometer; HPLC;

EOS M280 metals laser sintering additive machine; US Radar Quantum Triple Frequency GPR; CNS Soil Analyzer, Computer assisted music-production laboratory, broadcast/recording equipment, instruments, interactive display screens.

PAST PERFORMANCE: Application remote sensing technologies for water management (DOI), aging, snake venom, mathematical modeling (NIH), persistent sensing surveillance data storage, sensors, materials and manufacturing, hyperspectral imaging (DoD), air pollutants (DOT), AVIRIS imagery to map spatial variability (NASA), ecosystem sustainment, soil science, forestry, water quality, geographic information systems, urban populations, natural resources, sustainable agriculture, health and nutrition disparities (USDA),evaluating the characterization of chemical constituents from smokable hemp flower and vape products and future health impacts (FDA).