Alabama A&M University (AAMU) is a world-class research institution with scientists and facilities of the highest caliber. Our history of excellence illustrates how expertly we unite technical mastery, accountable oversight, and responsiveness.

Our customers include the Army Aviation and Missile Command, the Air Force Research Laboratory, the Office of Naval Research, the National Institutes of Health, the National Science Foundation, the National Aeronautics and Space Administration, the Departments of Energy, Education, Transportation, Agriculture, and Health and Human Services; the Defense Threat Reduction Agency, the Defense Information Systems Agency, the National Institute of Standards, the Army Research Office, the Small Business Administration, the Defense Intelligence Agency, and the United States Agency for International Development.

Our major industry partners are Boeing, SAIC, EG&G, Northrop Grumman, Lockheed Martin, and many others.

**SCIENCE AND TECHNOLOGY**

Our institution is involved in cutting-edge scientific endeavors to include nanoscience and technology, advanced technology in the development of sensors and sensor materials, materials science, laser beams, technology transfer and entrepreneurial development, environmental research and services, and agricultural sciences.

**THE FUTURE**

In thinking of new ways to solve existing problems while forecasting and anticipating, AAMU has already started preparing for the 22nd century. The University is prepared to provide a cadre of highly qualified engineers, scientists, managers, and others annually at a minimum:

- 40 Engineers (mechanical, electrical, civil, computer and information technology)
- 50 Business Majors (logistics, acquisition, finance, economics, and office systems management)
- 250 Liberal Arts Majors and Scientists (physics, chemistry, genetics, biology, leadership, management and administration)
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The School of Agricultural and Environmental Sciences operates in the traditional land-grant concept with instructional, research, and outreach programs. The school aims to provide a dynamic education for capable individuals who have the determination to prepare for a career in agribusiness, environmental science, forestry, family and consumer sciences, urban planning, and related scientific areas.

The mission is accomplished by applying scientific knowledge and basic skills of specific instructional programs. Students prepare for rewarding careers through the following modes: 1) Pursuit of courses in the general education curriculum of the University that provide desirable broad educational experiences for all students; 2) Development of a fundamental understanding of the basic principles of the physical, biological, and social sciences, as well as the humanities as applied to agribusiness, environmental science, family and consumer sciences, forestry, urban planning, and related areas; and, 3) Mastery of technical knowledge, basic skills, and their application as required for proficiency in their chosen areas of specialization.

### Degrees

The School offers bachelor’s and/or master’s degrees in 16 areas of study, including Agribusiness, Agricultural Economics, Animal Science, Environmental Science, Food Science and Technology, Forestry, Family and Consumer Sciences, Plant Science, and Urban and Regional Planning. The doctorate degree (Ph.D.) is offered in Plant and Soil Science, and Food Science.

### Departments

- Agribusiness Education
- Community Planning and Urban Studies
- Family and Consumer Sciences
- Food and Animal Sciences
- Natural Resources and Environmental Sciences

### Programmatic Accreditations

**Family & Consumer Sciences (BS)**
- American Association of Family and Consumer Sciences (AAFCS)
- American Dietetic Association (CADE)
- Certified Financial Planners Registration (CFP)

**Food Science (BS)**
- Institute of Food Technologists (IFT)

**Forestry (BS)**
- Society of American Foresters (SAF)

**Urban & Regional Planning (BS, MS)**
- Planning Accreditation Board (PAB)

### Fellows

- Soil Science Society of America (SSSA) American Society of Agronomy (ASA)
  - Dr. Robert W. Taylor (ASA, SSSA)
  - Dr. Tommy Coleman (ASA, SSSA)
  - Dr. Teferi Tsegaye (ASA)

- Crop Science Society of America (CSSA) American Society of Agronomy (ASA)
  - Dr. Udai R. Bishnoi

- American College of Nutrition (ACN) Institute of Food Technologists (IFT)
  - Dr. B. Onuma Okezie

- American Association of Family and Consumer Science (AAFCS)
  - Dr. Virginia Caples

- Society of American Foresters (SAF)
  - Dr. George F. Brown
This area caters and responds directly to the needs of small and limited resource farmers, researchers, organizations, agribusiness management specialists, extension agents, and consumers by providing them with research results, publications, outreach, and educational programs.

Community Planning and Urban Studies

- Community Planning: community needs assessment, housing analysis, economic development strategies and plans, community facilities planning including recreation and health care systems
- Housing policies and programs analysis and evaluation
- Land Use Planning: site planning, community-wide physical development planning, and evaluation of land-use systems change
- Land development and growth management
- Transportation Planning: urban and rural transportation needs and impact analysis as well as service design
- Analysis and monitoring of local and regional demographic change
- Comprehensive demographic and socio-economic analysis of the African American population in local, regional and national settings
- Environmental planning: monitoring and analysis of environmental justice threats and empowerment issues in urban and regional development and land utilization
- Regional and international development planning
- Community organization and outreach

Family and Consumer Sciences

- Functional clothing and design for special needs, including protective wear, young children and the elderly
- Performance analysis of textiles and apparel
- Historical analysis of textile and apparel artifacts
- Social, psychological and economic aspects of textiles and apparel
- Needs assessment and implementation of employee assistance programs
- Program development for childcare, youth and elder care
- Family violence prevention
- Community and social services identification for families
- Health issues impacting families and communities
- Development and application of intervention models to address health issues related to nutritional status
- Obesity and wellness
- Biochemical analysis of food items
- Demographics and issues related to nutrition, human development and apparel
Food and Animal Sciences

- Identification and extraction of bioactive components from peanuts
- Chemoprevention (colon cancer) using bioactive phytochemicals in foods
- Nutrition intervention for African Americans at risk of colon cancer
- Home food preservation
- Silencing the major peanut allergens
- Use of biosensors to detect food-borne pathogens
- Determination of microbial hazards and critical control points in food processing
- Novel protocols to optimize fertility and mass propagation of transgenic peanuts
- Application of biotechnology to improve health and nutritive qualities of peanuts
- Development of portable weight approximation system for swine production using machine vision and neural network
- Use of non-thermal processing in food processing
- Ultrasound enhanced separation and extraction of corn fiber for colon carcinogenesis
- Silvopasture systems for pine, sawlog, goat, food and forage crop production
- Enhance tenderness and juiciness of value-added products utilizing gelation
- Evaluation of distiller dried grain solutes for monogastric feeds
- Creation of value-added products from rabbit meat
- Inhibition of acrylamide formation

Natural Resources and Environmental Sciences

- Plant Science (Crop Science and Horticulture)
- Forestry (Forest Science and Forest Management)
- Environmental Science (Soil, Water and Environmental Sciences)

Research includes:
- Food and fiber production
- Environmental science and resource management
- Assistance to developing countries via training, research and demonstration activities
- Public service (extension) research and education via hands-on training programs, specialized publications, and short courses for farmers, landowners, community residents, organizations, businesses and other stakeholders
- Medicinal crops
- Biotechnology
- Water resource management
- Remote sensing/GIS application
- Biofuel
- Entomology
- Pathology
- Landscape design and horticulture
- Wetland restoration and analysis
- Waste management
- Organic farming
- Global climate change studies
- Bioinformatics
- Wild life ecology

CONTACT

School of Agricultural and Environmental Sciences
Dawson Building
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The mission of the School of Arts and Sciences is to provide high quality educational offerings in the fields of arts and sciences for capable students, including those who have experienced limited access to education. This is accomplished within the University’s traditional land-grant mission of teaching, research and service.

Offerings

Undergraduate major programs are offered in Biology, Chemistry, English, Mathematics, Physics, Political Science, Social Work, Sociology, and Telecommunications. Graduate degrees are offered in Biology, Social Work, Physics, and Applied Physics.

- More than 120 faculty and staff
- More than 1,700 majors combined from graduates and undergraduates
- Eleven buildings shared by faculty, staff and students
- Two major discipline divisions in the School
  1. Behavioral Sciences, Social Work, Humanities
  2. Natural and Physical Sciences, Mathematics

Departments

- Behavioral Sciences (History and Political Science, Sociology, Philosophy)
- Natural and Physical Sciences (Biology, Chemistry)
- English, Foreign Languages and Telecommunications
- Mathematics
- Military Science (ROTC)
- Physics
- Social Work
Bachelor’s Degree Programs

Applied Physics
Biology
Biology Pre-med
Botany
Chemistry
English
Honors Chemistry
Mathematics
Medical Technology
Physics
Political Science
Pre-Nursing
Pre-Veterinary Medicine
Social Work
Sociology
Telecommunications
Zoology
Zoology/Medical Technology

Research/Expertise in the Behavioral Sciences, Social Work and the Humanities

- Global/International Research
- History
- Religion/American Culture/Politics
- Criminal Justice
- Communication
- Theater
- Education
- Literature
- Foreign Languages
- Telecommunication
- Wellness/Social Welfare/Quality of Life Research

Research/Expertise in Biology

- Microbiology
- Genetics
- Mycology
- Indoor Air Quality
- Biofilms
- Pharmacology
- Human Physiology
- Medicinal Plants
- Health Disparity

Research Centers

- Center for Interdisciplinary Discovery via Engineering Nanofabrication (CIDEN)
- Howard J. Foster Center for Irradiation of Materials (CIM)
- Center For Learning, Teaching and Research in Nanoscale Science and Technology (CLTR)
- Center for Biomedical, Behavioral and Environmental Health Research (CBR)
- Center for Social Work Development and Research
Research/Expertise in Chemistry

- Molecular Dynamics of Proteins
- Laser Chemistry
- Sensor Application
- Nano-Chemistry
- Computational Studies of Poly-nitrogenous Molecules
- Air Pollution: Quality, Monitoring and Modeling
- Outreach Programs

Research/Expertise in Natural and Physical Sciences/Mathematics

- Materials Sciences – Nanomaterials
- Czochralski Crystal Growth from Melt
- Nanocomposites/Nanofabrications
- Nanoscale Science
- Nonlinear Optical Materials
- Sensor/Actuator Science and Technology
- Functional Materials Fabrication
- Materials Analysis and Characterizations
- Spectroscopy/Interferometry Analysis
- Space Sciences
- Optics – Materials Development, Bragg Grating
- Differential Equations/Modeling/Solitons
- Mathematical Statistics
- Bio & Chemical Sensors

Programmatic Accreditations

Council on Social Work Education (CSWE)

Fellows

Optical Society of America (OSA)
- Dr. Nikolai Kukhtarev

National Aeronautics and Space Administration (NASA)
- Dr. Mohan Aggrawal
- Dr. Jamiu Odutola

Minor Degree Programs

- Applied Statistics
- Criminal Justice
- Environmental Health
- Forensic Chemistry
- History
- International Studies
- Military Science
- Philosophy

Master’s & Ph.D. Degree Programs

- Biology, M.S.
- Physics, M.S.
- Social Work, M.S.W.
- Applied Physics, Ph.D.
  Materials, Optics and Space Science

CONTACT

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The mission of the School of Business is to provide a high quality management education that promotes the development of students’ potentials as managers, entrepreneurs, leaders, productive employees and socially responsible individuals. In addition to the coverage of basic business principles, all programs develop students’ computer, communications, interpersonal relations, and leadership skills, thereby preparing graduates for success in local, state, national, and global business environments. The School of Business builds on its historic mission of providing education for African Americans to an expanded mission of educating a student body that is diverse in terms of ethnicity, national origin, and socio-economic background.

The School offers bachelor’s degrees in economics, finance, management, marketing, accounting, and business administration. The school also has an excellent MBA program.

Research Centers

• Small Business Development Center (SBDC)
• Center for Disadvantaged Business Enterprise (DBE)
• Center for Entrepreneurship and Economic Development (CEED)
DEPARTMENTAL CAPABILITIES

**Accounting**


**Economics, Finance & Office Systems Management**

Management and Marketing


- **Marketing and Marketing Research** - Developing and Evaluating Marketing Strategy, Retail Management, Green Marketing, Place Marketing, Small Business Marketing, Marketing to Ethnic Minorities, Marketing Research, Promotion, Consumer Behavior.

**CONTACT**

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Within the context of other units of the University, the School of Education views its mission as that of preparing P-12 teacher candidates and other school personnel to be effective educators and service professionals who can help all students learn. Through its programs of teaching, research, and service, the School of Education’s mission is consistent with the land-grant mission of Alabama A&M University.

Research Mission
To promote and facilitate the development and dissemination of high-quality knowledge, abilities, and dispositions relating to effective teaching and learning.

Teaching Objectives
• To create, select, and organize high-quality knowledge, abilities, and dispositions to be transmitted to candidates.
• To create and maintain a positive and supportive learning environment in which candidates will desire to acquire and process knowledge, abilities, and dispositions presented by the faculty.
• To engage candidates in a series of supervised teaching acts to develop the requisite proficiencies of an educational service professional.
• To use a variety of assessment strategies for determining candidate proficiencies and unit effectiveness.

Research Objectives
• To create and maintain an environment that supports the engagement in research and other scholarly pursuits that result in newer and more effective approaches to teaching and learning.
• To maintain a high level of familiarity with current research and scholarly activity within the field of education.
• To disseminate up-to-date knowledge, abilities, and dispositions through classroom teaching, professional writing, and through presentations to professional associations and other community groups.

Service Mission
To establish and maintain collaborations and partnerships that facilitate changes to improve education.

Departments
• Curriculum, Teaching & Educational Leadership
• Elementary & Early Childhood Education
• Fine Arts
• Health, Physical Education & Recreation
• Psychology, Counseling, Special Ed & Communicative Sciences and Disorders

Degrees
The School offers degrees in Education under the following:

- Agriscience Education
- Family and Consumer Science Education
- Business and Office Education
- Technology Education
- Technical Education
- Secondary Education
- Early Childhood Education
- Elementary and Middle School Education
- Special Education
- N-12 programs in:
  - Art
  - Music
  - Physical Education
Baccalaureate Degrees
- 2 Elementary Education
- 3 Special Education
- 1 Communicative Sciences and Disorders
- 1 Psychology
- 1 Physical Education
- 14 Secondary Education
- Art Education
- Music Education

Master’s 27
Educational Specialists 14
Ph. D. in Reading/Literacy

Programmatic Accreditations
- National Council for Accreditation of Teacher Education (NCATE)
- American Speech and Hearing Association (ASHA)
- Council for Rehabilitation Education (CORE)
- American Association of Colleges for Teacher Education (AACTE)
- American Psychological Association (APA)
- Council for Exceptional Children (CEC)
- International Reading Association (IRA)
- Music Educators National Conference (MENC)
- American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD)
- Alabama State Association for Health Physical Education Recreation and Dance (ASAHPERD)
- Association of Childhood Education International (ACEI)

Departmental Capabilities
Curriculum, Teaching & Educational Leadership
- Leadership and executive development
- Program development, planning and evaluation
- University-industry-community partnerships and strategic initiatives
- Analysis and examination of leadership
- Organizational analysis
- Institutional governance
- Classroom teaching and learning of science
- Prior knowledge, language and social relationships
- Professional development schools
- Effectiveness of integrating technology into instruction and learning
- Multimedia impact on learners
- Distance education, and instructional design in a technology-integrated environment
Elementary and Early Childhood Education

- Provide highly qualified Elementary and Early Childhood candidates who will lay the educational foundation for young children
- Partnerships with professional development schools
- Candidates develop an extensive knowledge base, i.e., learning theory, teaching and learning
- Candidates are prepared to pursue other professional careers such as law, school counseling, special education, etc.
- More than 20 percent of graduates earn terminal degrees
- Two-week summer seminars offered in a wide variety of subjects, i.e., learning styles, environmental science
- Latest technology is integrated into instruction

Fine Arts

- Art
  - Art Education
  - Graphic Design
  - Studio Art
- Music
  - Music Education
  - Conducting
  - Applied Music
  - Jazz Theory
- Painting
- Art Appreciation
- Website Creation
- Music Theory
- Percussion Methods
- String Methods
- Vocal Dictation and Literature

Health, Physical Education & Recreation

- Basic knowledge in biological and other sciences related to the human body and principles of human movement
- Organization, implementation and evaluation of physical education and athletic programs at all grade levels
- Assessment, development and maintenance of cardiovascular and physical fitness
- Injury prevention and treatment
- Coaching and officiating techniques

Psychology, Counseling, Special Education and Communicative Sciences & Disorders

- Survey of training and work experiences of school counselors
- Colorectal cancer project
- Alabama Department of Education Planning Grant – Innovative program to prepare secondary education students in special education counseling

Specialties/Recognitions

- World’s only university-based oral facial myology clinic
- Speech and hearing clinic available to the community and the University
The mission of the School of Engineering and Technology is to provide the educational settings that allow well-prepared and dedicated students the opportunity to become educated in the sciences, engineering disciplines, and related competencies, so that they may become professional practitioners of computer science, engineering and engineering technologies. In addition to collaborations with other technology-based institutions around the country, the School of Engineering and Technology has used its location in north Alabama to a great advantage. It is forging strong relationships with some of Huntsville’s most respected industries and employers, including the Department of Defense, the U.S. Army, NASA/ Marshall Space Flight Center, major aerospace and defense contractors, as well as numerous high-tech entrepreneurial engineering firms and other small businesses.
Departmental Capabilities

Civil Engineering
- Computational Fluid Dynamics
  - Finite Difference/Volume; Combustion/Radiation; Rarefied Gas/Hypersonic/Microchannel Flow
- Environmental Engineering
  - Numerical Simulation of Groundwater Contamination; Geospatial Database; Environmental Restoration and Waste Management
- Structural Engineering
  - Computational Solid Mechanics; Thermal-Mechanical Modeling; Fracture Mechanics; Non-Destructive Evaluation; Seismic Analysis
- Transportation Engineering
  - Pavement Modeling/Analysis; Transportation Materials; Pavement Instrumentation
- Geotechnical Engineering
  - Soil-Structure Interaction; Low Cost Soil Improvement/Ground Modification

Electrical Engineering
- Microelectronics
  - Silicon VLSI/MEMS/Polycrystalline and Hybrid Device Design, Fabrication and Test; Single-walled Carbon Nanotube Based Nanoscale Electronic Devices
- Pattern Recognition, Target Classification and Identification
  - Automatic Fault Diagnostics and Prognostics; Condition Based Maintenance; Supergeneralized Matched Filters; Anomaly Detection; Background Removal, Hyperspectral Data Compression; Signal Processing; Sensor Fusion
- High Performance Computing
  - Computer Clusters and Parallel Processing; Finite Element Analysis; Finite Element Time Domain Analysis

Electromagnetics, Antennas and Communications
- Ultra-Wideband Antenna Arrays; Ultra-Wideband Channel Modeling; Antenna Engineering; MEMS Applications to Millimeter Wave Systems; Sensor Arrays

Materials Science
- Analysis, Simulation, Characterization, and Testing of Microelectronic Materials; Single Crystal and Poly-Crystal Technologies Including Hybrid Devices; Analysis of Microelectronic Failure Modes; Device Design, Development, Fabrication, Performance Evaluation Under Nominal and Non-Nominal Conditions

MS Degrees Offered
- Computer Science
- MEng Materiel Engineering
  - Civil Engineering
  - Electrical Engineering
  - Mechanical Engineering
- Industrial Technology

Programmatic Accreditations
Accreditation Board for Engineering and Technology (ABET)
- Computer and Information Science (BSCS)
- Civil Engineering (BSCE)
- Electrical, Electronics & Communications Engineering (BSEE)
- Electrical/Engineering Technology (BSET)
- Mechanical Engineering (BSME)
- Mechanical Engineering Technology (BSET)
Mechanical Engineering

- Propulsion
  - Advanced RAM and SCRAMJET Propulsion, Vehicle Integration, Hybrid Rocket Propulsion and Micro-Thrusters, Rocket Based Combined Cycle, Turbo Rocket Combined Cycle
- Materials
  - Composites and Other Non-Metallics for Design Applications
- Structural Analysis
  - Fracture Mechanics and Crack Propagation, High and Low Cycle Fatigue, Life Cycle Analysis, Structural Dynamics, Finite Element Analysis
  - Laser Scanning and Measurements
  - Fast Detection of Flaws and Micro-Crackings, Health Monitoring of Composite Missile Structure
  - Mixed Mode Failure and Deformation at Crack Tips, Warping Strain in Thin Sheets Under Internal Pressure and Tensile Loading and Determining Seam Disbonds in Deicing Mechanisms
  - Deformation, Strain, and Temperature Fields in Sliding Contact, Residual Stresses in Plastic and Ceramic/Composites
- Quality Assurance, Reliability and Safety
- High Performance Parallel Computing

Computer Science

- Software Development
  - Graphics and Imaging, A/I and Expert Systems, Neural Networks, Robotics
- Simulation
  - Hardware in Loop, Monte Carlo, Random Variate, 6 DOF
- Computer Support
  - Networking, Encryption, Data Recovery
- Data Archiving and Data Mining

Technology

- BioTechnology/BioManufacturing
- Electro Optics
- Automation, Manufacturing Systems and Instrumentation
- Structures, Construction Materials and Structural Health Monitoring
- Transportation Infrastructure Security and Safety

CONTACT
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The mission of the Alabama A&M University Research Institute (AAMURI) is to pursue, negotiate, and enter into contracts in a timely and professional manner as well as to promote and aid in the fulfillment of the educational functions of AAMU through publications, discoveries, and inventions for the advancement of science and education.

A 501(c)3 entity of AAMU, the Institute partners with faculty and students from disciplines in the University’s five schools. Nationally, the Institute has also partnered with as many as 30 major corporations and over 200 small businesses in Alabama and across the nation. The Institute matches University researchers and local small businesses to appropriate industry and government contracts.

GETTING STARTED

As the contracting arm of the University, the Research Institute understands how to meet your research needs while fulfilling industry and government management requirements. Its track record includes world-class research endeavors that are government-focused with top-level management to ensure quality, not to mention its competitive costs. Its partnerships with entities like Boeing, SAIC, Northrop Grumman, USAID and many more have resulted in several recognitions such as the prestigious Nunn-Perry Mentor Protégé Award.

THE WHOLE PICTURE

Modern research and development (R&D) requires expert knowledge and seasoned managers. What separates Alabama A&M University from the rest is not our research capabilities - which many institutions offer - but our ability to combine state-of-the-art scientific inquiry with rigorous oversight.

Our research, development and testing services include:

- Cleared personnel and facilities
- Full-cost accountability
- DCAA audit compliance
- Low administrative costs

If your vision requires a partner that sees the whole picture and has a history of proven performance and timely delivery, then AAMURI is the clear choice.