



HLC Accreditation 2016-2017

## **Evidence Document**

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Research and Technology Transfer

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### **Research at Wichita State**

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**Additional information:**

# Research at Wichita State

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Wichita State University's location in the heart of Wichita –a mecca for aircraft manufacturing, healthcare and business– provides the opportunity for applied learning and research to be infused throughout each student's educational experience. By conducting research and internships in their fields, students gain real-world experience, allowing them to develop and apply critical skills.

And students aren't the only ones who benefit. Local businesses count on WSU centers like the National Institute for Aviation Research (NIAR), Center for Economic Development and Business Research, Applied Psychology Research Institute and Advanced Networking Research Institute as a vital part of their business plan.

- **Ranked #1** among all U.S. universities in industry-funded aeronautical research and development expenditures
- **Ranked #4** among U.S. universities in aeronautical research and development expenditures
- **Ranked #8** among U.S. universities in industry-funded engineering research and development expenditures
- **34** [research centers and institutes](#)
- **\$64** million in externally-funded research at Wichita State.
- **200+** industry and government clients and research partners

## Core Research Areas

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### Aerospace

Wichita State is home to the [National Institute for Aviation Research](#), known internationally for its expertise in aeronautical research and certification testing especially in structural dynamics and advanced materials. The [aerospace engineering department](#) and faculty are also responsible for a substantial amount of research in aerodynamics/fluid mechanics, aircraft structures/solid mechanics/composites/materials and flight mechanics/controls/simulation.

### Anthropology

The [Department of Anthropology](#) includes the [Holmes Museum of Anthropology](#), research laboratories, darkroom, mainframe, various field research stations and department library. Areas of research include [archaeology](#), [biological anthropology](#), [cultural anthropology](#) and [linguistics](#).

### Biology/Life Science

Faculty and graduate student research in the [Department of Biological Sciences](#) includes environmental biology and cellular and molecular biology. [Facilities](#) include environmental growth

chambers, refrigerated rooms, herbarium, vertebrate study collection, climate-controlled greenhouse, animal care facility and the [Biology Field Station – Ninescah Reserve](#), which includes 330 acres of native prairie, restored prairie, wetlands and riparian woodland and offers opportunities for studying grassland restoration, river ecology and general wildlife biology.

### **Business/Commerce/Economics**

Faculty and students in the [W. Frank Barton School of Business' School of Accountancy](#) and departments of [economics](#), [management](#) and [marketing](#) specialize in areas including stock market behaviors, labor relations, real estate, entrepreneurship, human resource management, international business and finance, management, supply chain and branding.

### **Chemistry**

Faculty specialize in many areas including biochemistry; organic, inorganic, physical, materials, analytical, bio-organic and medicinal chemistry. Students conduct cutting-edge research using state-of-the-art instrumentation. Their research is focused on areas of national importance such as health, alternative energy and advanced materials.

### **Community Affairs/Criminal Justice**

The [School of Community Affairs](#) is active in [criminal justice research](#), producing numerous textbooks and publications in research areas including crime statistics, computer crime, homicide, human rights, policing, police behavior, police training and police policy issues. The department operates the [Regional Community Policing Training Institute](#) which provides current information and research on community-oriented policing specifically addressing the issues and needs of police agencies in Kansas and Nebraska.

### **Communication Sciences and Disorders**

The [Evelyn H. Cassat Speech-Language-Hearing Clinic](#) provides opportunities for faculty and students to conduct clinically related research designed to advance the knowledge base in the [communication sciences and disorders](#). Faculty specialize in areas such as [autism spectrum disorders](#), [fluency disorders](#), social interaction analysis, [hearing conservation](#), pediatric rehabilitation, dysphagia, early language and literacy and language acquisition.

### **Composites and Advanced Materials**

With its location in one of seven international clusters for composites manufacturing, Wichita State is well-known for its research in [composites and advanced materials](#). Faculty and graduate students in the [College of Engineering](#) specialize in nanocomposite technology, researchers in the [Center for Innovation for Biomaterials in Orthopaedic Research](#) are implementing aerospace composites into the medical industry and researchers in the [National Institute for Aviation Research](#) specialize in composite material qualification and repair methods.

### **Education**

The [Department of Education](#) includes several research programs and centers aimed at improving the field of education including the [Wichita Teacher Quality Partnership](#), [Center for Research and Evaluation Services](#) and [COE Technology Center](#).

### **Electrical Engineering/Computer Science**

The faculty of the [Department of Electrical Engineering and Computer Science](#) conduct research in various areas, including computer systems and architecture, computer networking, wireless communication, control theory, energy-intelligent mobile computing, communication for smart electric grids, pervasive wireless networks, energy management in renewable energy based sensor networks, data intensive sensor networks, distance learning, electromagnetics, optics, power systems, power

quality and databases.

### **Mechanical Engineering**

Faculty and graduate students in the [mechanical engineering department](#) are committed to research in design and analysis for use in industries such as manufacturing, aircraft and automotive to consumer products and building equipment. In these jobs, mechanical engineers design products, machines and develop processes for manufacturing.

### **Geology**

Wichita State is located within a day's drive from numerous classic sedimentary, igneous, metamorphic, paleontologic and structural locales in Colorado, New Mexico, Oklahoma, Missouri and Nebraska. Research areas of expertise include geochemistry; hydrogeology and environmental geology; sedimentary, stratigraphy and petroleum geology; paleontology and paleoecology; and structural geology and tectonics.

### **Human Performance**

The [Human Performance Lab](#) provides performs collaborative research with local, state and regional companies and other programs including [bioengineering](#), [human factors psychology](#), [WSU's Regional Institute on Aging](#), and the [University of Kansas Medical Center-Wichita](#).

### **Industrial and Manufacturing Engineering**

The [Industrial and Manufacturing Engineering Department](#) is committed to experience-based instruction and research in design, analysis and operation of manufacturing and other integrated systems of people, material, equipment and money.

### **History**

Faculty in the [department of history](#) are experts in many areas of American and European history. Our professors are publishing scholars in their fields as well as strong and active teachers.

### **Music**

Faculty in the [School of Music](#) include specialists in many areas of music performance and education. Collaboration opportunities exist with the [Wichita Symphony Orchestra](#) and Kansas' largest school district, [USD 259](#).

### **Mathematics**

Areas of research include [analysis](#), [applied mathematics](#), [computational mathematics](#) and [statistics](#). Faculty study such diverse fields as partial differential equations, inverse problems, combinatorial mathematics, numerical analysis, several complex variables, probability theory, differential geometry and analysis.

### **Philosophy**

The [Department of Philosophy](#) is fortunate to have on its faculty experts in a broad range of philosophical topics. All the traditional areas of philosophy, as well as several major sub-specialties, are represented.

### **Physics**

[Physics](#) professors at Wichita State are actively engaged in research areas including conductivity, nano-science, quantum physics, experimental condensed matter, nuclear physics, astrophysics, biophysics and solid state physics.

### **Psychology**

The [Psychology Department](#) is committed to conducting applied research to enhance psychological science. In the department's 14 dedicated research laboratories, groups and clinics, our faculty members and students work side by side on projects that advance the field of psychology in real and meaningful ways.

### **Social Science**

The [Social Science Research Laboratory](#) provides services for the WSU community, other colleges and universities and nonprofit organizations. Services include administering and analyzing [Students' Perception of Teaching Effectiveness \(SPTe\)](#) instruments, [exam grading](#), [Qualtrics survey tool](#), and [data analysis](#).

## **Research Centers at WSU**

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- [Applied Psychology Research Institute](#)
- [Applied Technology Acceleration Institute](#)
- [Center for Community Support and Research](#)
- [Center for Economic Development and Business Research](#)
- [Center for Energy Studies](#)
- [Center for Friction Stir Processing](#)
- [Center for Physical Activity and Aging](#)
- [Center for Real Estate](#)
- [Center for Research and Evaluation Services](#)
- [Center for Urban Studies](#)
- [Center for Women's Studies](#)
- [Ennovar](#)
- [National Institute for Aviation Research](#)
  - [National Center for Advanced Materials Performance](#)
  - [Center of Innovation for Biomaterials in Orthopaedic Research](#)
  - [Center of Excellence for General Aviation](#)
  - [Center of Excellence for Composites and Advanced Materials](#)
- [Regional Institute on Aging](#)