COLLEGE OF ENGINEERING AND COMPUTER SCIENCE (CECS) PROFILE

DR. DWAYNE JERRO, CHAIR OF MECHANICAL ENGINEERING DEPARTMENT

CECS DEGREE PROGRAMS

- Civil Engineering
- Electrical Engineering
- Mechanical Engineering
- Electronics Engineering Technology
- Computer Science
- Master of Engineering
- Master of Science in Computer Science

ACCREDITATION STATUS

All Programs are Accredited by Accreditation Board for Engineering, Computer Science and Technology

STRATEGIC AREAS OF SIGNIFICANT RESEARCH

- Computation, communication, and information,
- Advanced materials,
- Nanomaterials, nanoscience, and devices, and
- Energy and the environment.

COMPUTATION, COMMUNICATION & INFORMATION

- Telecommunications & Networking: Stochastic modeling and data-compression for various air force applications such as cognitive radio; efficient numerical algorithms and experimental simulations to help improve complex systems including ad-hoc sensor networks and networked robotics.

- High Performance Computing & Visualization: Ultra modern CAVE experimental setup to compute and visualize algorithms requiring less time and computer memory than conventional algorithms and hurricane in non-turbulent weather and then using the analysis to real world problems.

ADVANCED MATERIALS

- Materials: High Temperature Testing, Industrial Metallurgy and Materials Engineering, Materials Processing, Mechanical Behavior of Materials/Microstructure and Nanocrystalline Materials
- Composite Materials: Chemical Characterization and Surface Analysis, Composites Manufacturing, Mechanical and Impact Testing, Thermal Analysis

NANOMATERIALS, NANOSCIENCE & DEVICES

- Airborne Radar Modeling and Simulation : Geo-location and simulation of enemy positions and two-dimensional beam steering and adaptive optics in developing the electronic system

- Solid State Devices & Microelectronics Fabrication: Field of solid state devices and micro-electromechanical devices and systems; cutting edge study of MOSFETs and miniaturization of sensors for adhoc networks using a class 100 Clean Room; miniaturization of Li-Ion battery and dry processing.

ENERGY AND THE ENVIRONMENT

- Environmental engineering which includes solid/hazardous waste management, bioremediation of soil and water contaminated with chlorinated solvents and hydrocarbons, in situ treatment of municipal landfill leachate, water supply and treatment, wastewater collection and treatment, air pollution control, air quality monitoring, and atmospheric dispersion modeling.

- Water Resources engineering which includes safety of dams, streamflow modeling, groundwater pollution and control, runoff calculation using GIS.

- Thermal Science/Fluids: Combustion and Reacting Flows, Computational Fluid Dynamics and Heat Transfer, High Heat Flux Applications and Multi-phase Transport Processes and Phase change in Porous Media and in Manufacturing Processes

- Energy Conservation: HVAC, Solar Energy System Design, Alternative Energy, Computer-based Preventative Maintenance, Energy Management Control System Analysis, and Computer Simulation of Buildings

CHARACTERIZATION EQUIPMENT LAB

- Accelerated Weathering Tester (Q-Panel Lab Products Model QUV/Spray)
- Dynatup® Model 8250 Instrumented Impact Test System
- Ultrasonic NDE System- Specifications
- Rheometric Solid Analyzer Model 3 (RSA)
- Split Hopkinson Pressure Bar (SHPB)
- Hitachi Hitachi S-2460N Scanning Electron Microscope
- Flashline Thermo-Physical Property Analyzer System
- Differential Scanning Calorimetry

FABRICATION LAB

- Compression Molding Press
- Resin Transfer Molding Extrusion System
- WLH two-axis filament winder
- RTM-resin transfer molding equipment
- NETZSCH type 50 three-roll mill
- Two-stage light gas gun device
- A high speed imaging system

NANOSCALE WIRELESS SENSOR SYSTEMS AND NETWORKS LAB

- Class 100 Cleanroom
- Inspiron 8600 Intel M Processor
- Precision Workstation 370 Desktop
- Precision Workstation 370 Minitower
- Adhoc, Self Organizing, Multihop iBean Neetwork Evaluation Kit
- Commercial Developer's Kit
- Basic Stargate Developers' Kit
- Multi-channel MICA2 Processor Radio Board
- Multi-channel MICA2 DOT Processor Radio Board
- Advanced Stargate Developer's Kit
- Basic Stargate Developer's Kit
- MICA Ethernet Interface Board
- MICA/MICA2 Sensor Board

MACHINING LAB

- 3-D Precision Automatic Cutter
- Panel Saw
- Core Drills and Drill Presses
- Rotary Power Tool
- Lathe Machine
- Water-cooled band saw machine
- CNC Milling Machine

FACILITIES

P.B.S. Pinchback

117,000 Square feet

60% Laboratory Space

Moore Hall

~10,000 Square feet

Classrooms and Laboratories for EE & EET

Immersive Virtual Environment

The CAVE is a room-sized advanced visualization solution that combines high-resolution DLP™ based stereoscopic projection technology and 3-D computer graphics to create the illusion of complete sense of presence in a virtual environment. The CAVE allows multiple users to immerse themselves fully in the same virtual environment at the same time.

Components

Graphics Computers

The Centre for Immersive Virtual Environments main computer is a 10 processor Windows 2000 Cluster with 4 graphics pipelines..

Stereo Glasses & Head-Mounted Display (HMD)

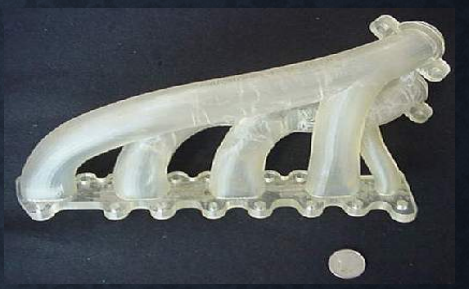
Interactive & Cyber Gloves:

An Interactive Glove features advanced fiber-optic flex sensors to generate finger-bend data. Move easily through the virtual world by combining hand gestures with the pitch and roll of the user's hand

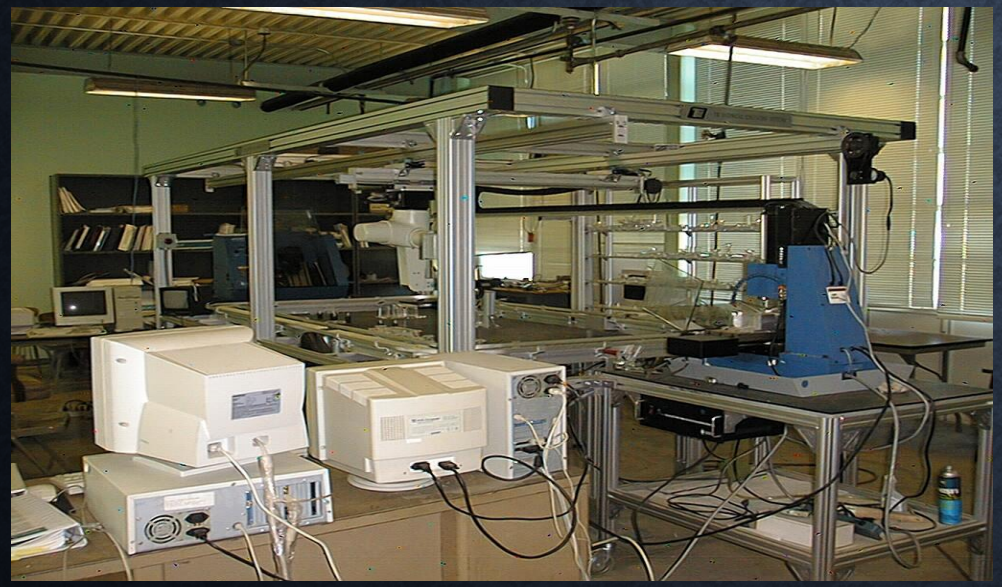
Rapid Prototyping Laboratory

ThermoJet Solid Object Printer

Stereo-Lithography Apparatus (SLA)



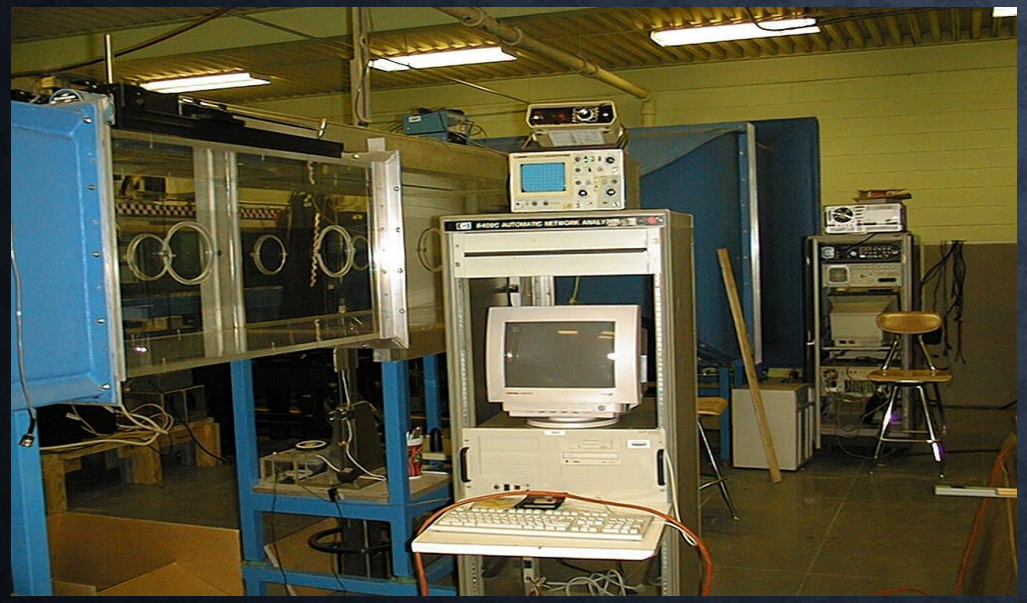
Computer Integrated Manufacturing (CIM) Lab



TII CIM Cell

CNC Lathe and Milling Machines

Aerospace Laboratory



Wind Tunnel

Water Tunnel

Metallurgy Laboratory

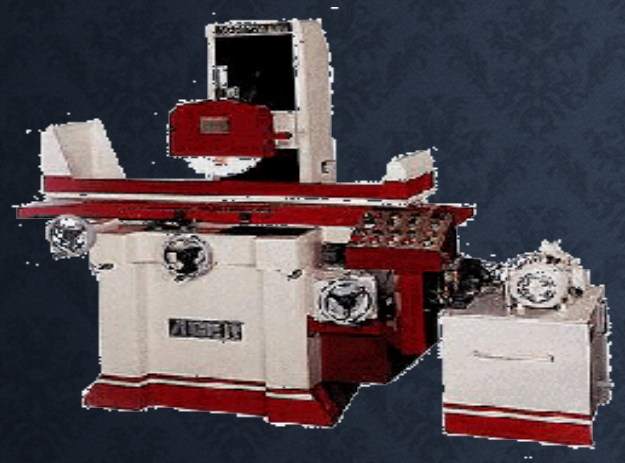
Hitachi S-2460N Scanning Electron Microscope (SEM)

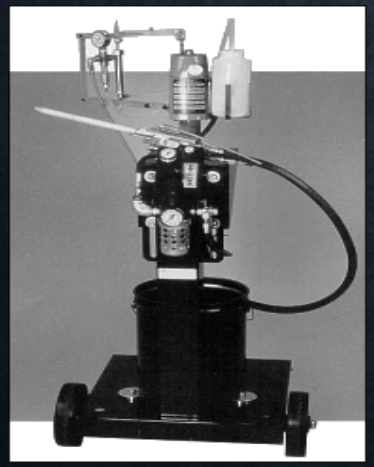
Materials Testing Laboratory

MTS 810 Universal Testing Machine

Dynatup 8250 High Velocity Impact Machine

Composite Materials Laboratory





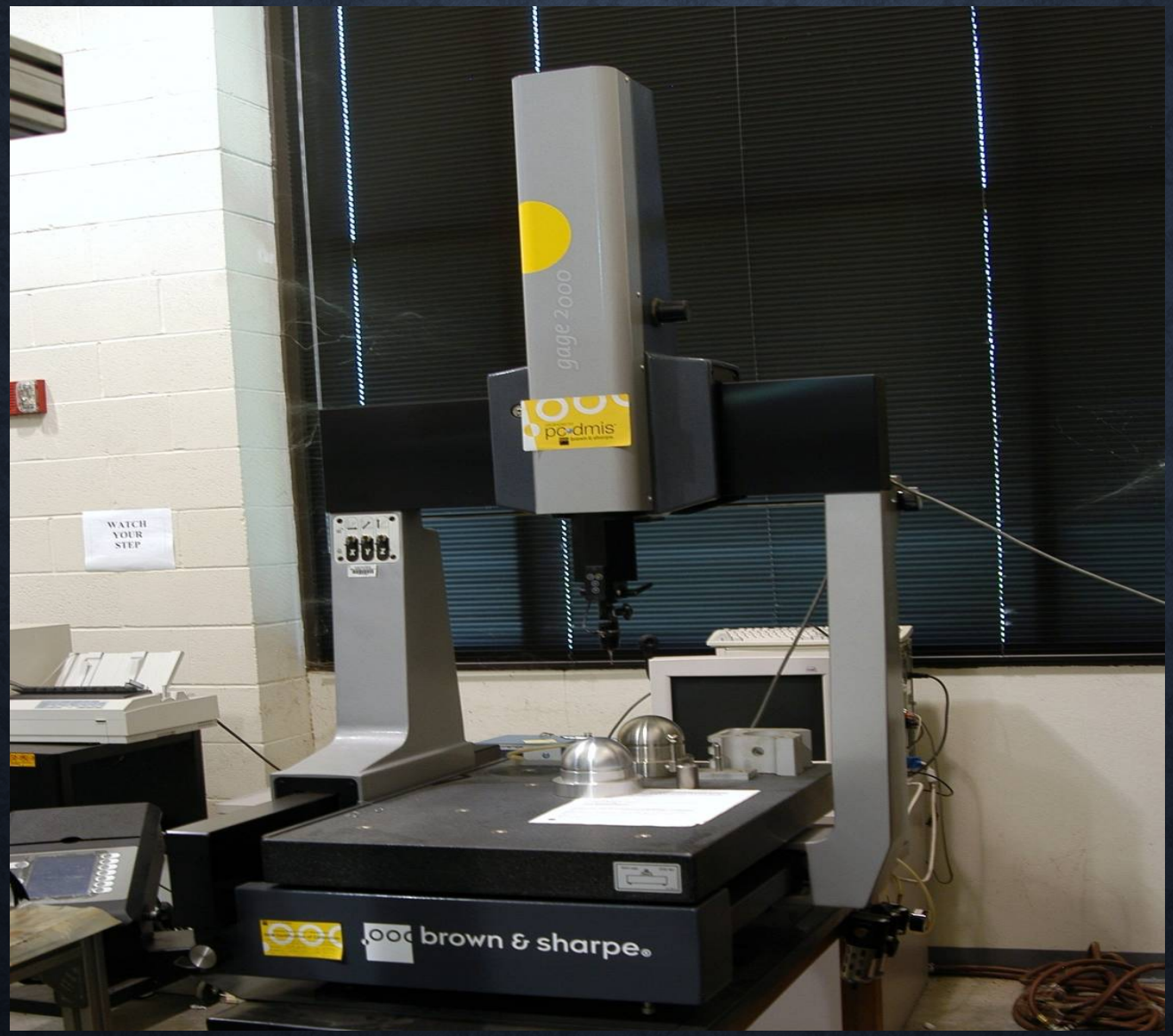
Environmental Testing Lab

Environmental Analytical Lab

Materials Processing Lab


MTS
810 Material Test System
DANGER
Tensile Test


Mazak
QUICK TURN 20
DANGER
KEEP HANDS OUT OF MACHINERY
DANGER
Watch Your Hands and Fingers
MAZATROL T PLUS
AMT
NOTICE
Emergency Eye Wash


WATCH
YOUR
STEP
gage 2000
pc-dmis
brown & sharpe


CRS
ROBOTICS


SLA-250/50
STEREO-LITHOGRAPHY
MACHINE


Universal Testing Machine
DELL

INDUSTRY ...


CATERPILLAR


NS
NORFOLK SOUTHERN


DOW


Raytheon


BOEING


Pratt & Whitney
A United Technologies Company


ExxonMobil


GM


UGS
Transforming the process of innovation


DELPHI


Entergy
THE POWER OF PEOPLE™


hp
invent


ADTRAN


freescale
semiconductor


DUPONT


P&G


TEXACO


BASF
The Chemical Company


Ford


XEROX


ConocoPhillips
3M

GOVERNMENT …

LQESF

THE LOUISIANA QUALITY EDUCATION SUPPORT FUND 8(g)

Louisiana Board of Regents

EPSCoR
Experimental Program to Stimulate Competitive Research

Sandia National Laboratories

National Renewable Energy Laboratory (NREL)

Lawrence Livermore National Laboratory (LLNL)

Oak Ridge Institute for Science and Education + (ORISE)

ARGONNE NATIONAL LABORATORY

National Nuclear Security Administration

ACADEMIA …

Louisiana State University LSU

The J. Bennett Johnston, Sr. CAMD
Center for Advanced Microstructures and Devices

LCED Louisiana Council of Engineering Deans

cperc
CLEAN POWER AND ENERGY RESEARCH CONSORTIUM

The CENTER for ENERGY and ENVIRONMENTAL STUDIES

NEEDS
National Engineering Education Delivery System

SYNTHESIS A National Engineering Education Coalition

NACME
National Action Council for Minorities in Engineering +

Southern University and A&M College
Incorporated 1880
Relocated 1914
Baton Rouge, La.

Marquette University

MichiganTech

HBCUs
Council of Engineering Deans

AMIE
Advancing Minorities' Interest in Engineering

Black Engineer of the Year Awards Conference

FACILITIES

- **Classrooms**- 5 Multimedia-ready, 1 High Tech, 3 traditional, 2 dual-use, and 6 lab/lecture rooms
- **Laboratory Facilities**- 33 Instructional Labs, 16 Research Labs with State-of-the-Art Equipment
- **Computing Facilities**- ~ 500 Computers for Faculty & Students Loaded with Engineering Software Packages
- **Courseware Studio**- Equipped with the Latest Software & Hardware for Professional Preparation of Course Presentation Materials
- **E-Mail & Internet Services-** Accessible in All Labs, Offices, and Classrooms Enabling Us to Explore the Far Reaches of Cyberspace
- **Interactive Learning-** Integrating Innovative Techniques into Instruction Such as CAVE (Computer Assisted Virtual Environment) ~ a 3D Virtual Reality System

PAST PERFORMANCE

1. "A Study of Advanced Materials for Gas Turbines at Elevated Temperatures Using Selected Microstructures and Characteristic Environments for Syngas Combustion", DOE NETL
2. "Towards Miniaturization of the Naval Nuclear Propulsion Reactors: Novel Processing Routes of Fabricating Microstructures on pressurized Water Reactors", DOE, NNSA
3. "Testing and Modeling of Blast Response of Functionally Graded Composite Armor," Department of Defense.
4. "Molecular Dynamic Simulation of Impact on Composite Material," NASA-BoR LaSPACE/REA
5. "Smart Adhesively Bonded High-Performance Joints for Composite Structures," NASA-BoR/EPSCoR
6. "Elimination of Deck Joints Using a Corrosion Resistant FRP Approach," Louisiana Transportation Research Center.
7. "Development of Advanced Grid Stiffened FRP Tube-Encased Concrete Columns," Federal Highway Administration/Louisiana Transportation Research Center
8. "Composite Columns and Poles for Infrastructure and Homeland Security Applications," Louisiana Board of Regents and EDO Fiber Science
9. "FRP grid tube encased concrete columns," Louisiana Board of Regents/Economic Development Assistantship (EDA)
10. "Energy Initiative Project-Advanced Materials Research Laboratory", Louisiana Board of Regents

PAST PERFORMANCE (CONTINUED)

11. "Smart Syntactic Foams," Louisiana Board of Regents PhD Fellowship in Engineering/LSU College of Engineering,
12. "IPA Assignment Agreement," National Science Foundation.
13. "Instrumentation for Enhancing Instructions in Environmental Science and Engineering" Department of Army
14. "Lower Atchafalaya Basin Floodway System, Louisiana Project (ABFS) Development of Water Management Unit: Preliminary Planning Investigation," U.S. Army Corps of Engineers, New Orleans District
15. "Clean Power and Energy Research Consortium", Louisiana Board of Regents
16. "Engineering S & M Verification and Assembly Analysis" The Boeing Company
17. "CAD Modeling Tools Task Order"- The Boeing Company
18. "The LONI Institute: Advancing Biology, Materials, and Computational Sciences for Research, Education, and Economic Development,"
19. "Expanding Engineering Outreach Activities", Halliburton Company
20. "Advancing Scholarship in Engineering Education", National Academy of Science

PAST PERFORMANCE (CONTINUED)

21. "Shuttle Software Error Code Database-Boeing Intern,"

22. "Effective and Efficient Smart Composite Joints for Coupling Composite Pipes," Louisiana Board of Regents and SMI Companies

23. "Characterization and Development of Truck Load Spectra and Growth Factors for Current and Future Pavement Practices in LA"

24. "Sensors Technical Thrust Research", Clarkson Aerospace Corp

25. "Sensors Technical Thrust Research, H.S. Component", Clarkson Aerospace Corp

26. "Enhancement of Research in Materials Science and Physics through the Acquisition of Non-Destructive Investigative Equipment", Louisiana Board of Regents.

27. "HBCU-RISE Advanced Infrastructure Composites (AIC)," National Science Foundation

28. "Enhancement of Research in Materials Science and Physics Through the Acquisition of Non-Destructive Investigative Equipment," Louisiana Board of Regents

29. "Cyber Information Extraction", Louisiana State University

30. "Detection and Sensing of Environmental and Chemical Substances using Ad-hoc Wireless Networks", DoE/NNSA