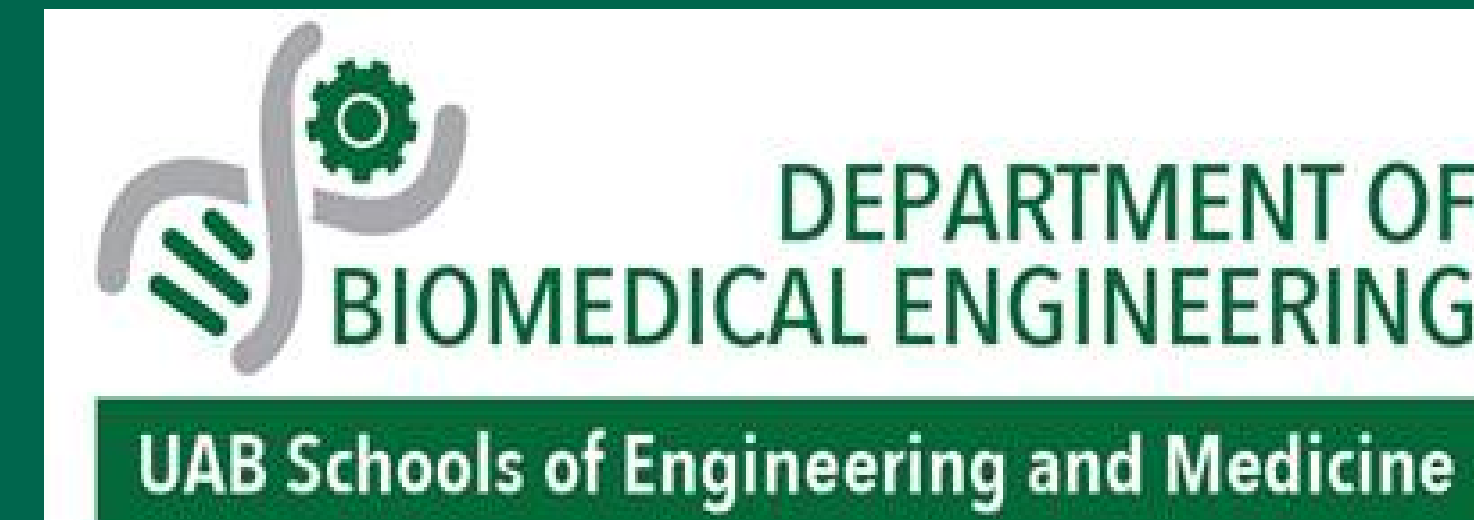




# The Experimental Biomechanics Core

Director: Alan W. Eberhardt, PhD

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## Mission & Vision

The **Mission** of the Experimental Biomechanics Core (EBC) is to provide collaborating investigators with state-of-the-art equipment and trained personnel to facilitate mechanical testing and measurement of mechanical properties of biological and man-made materials, structures, and constructs.

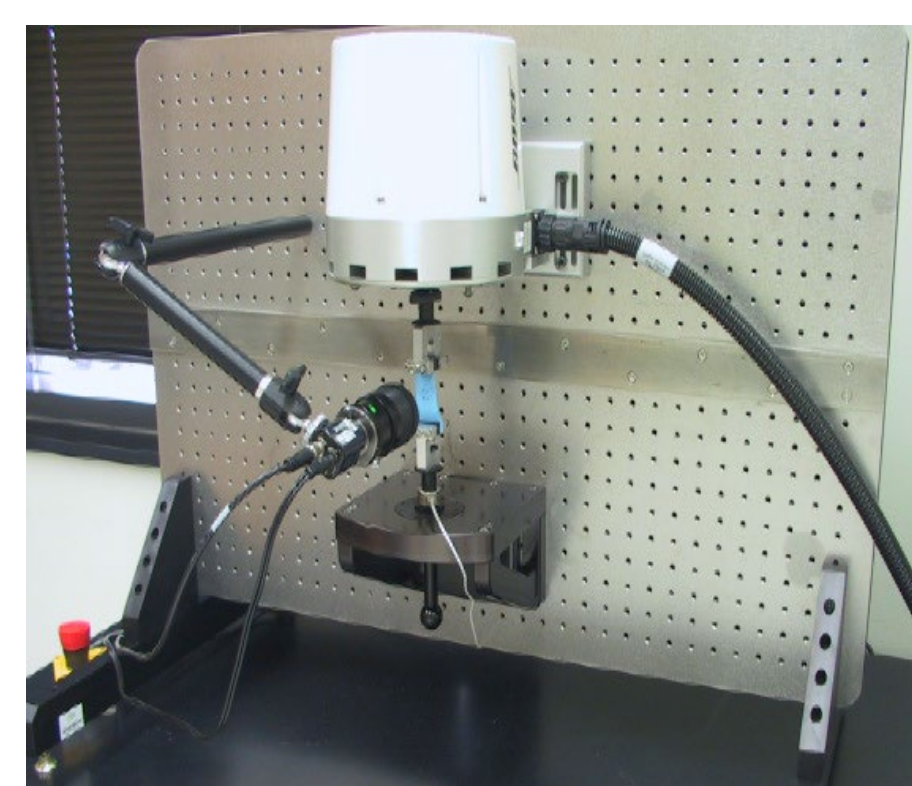
The **Vision** for the EBC is to be a self-contained, fully supported experimental Core facility, with trained staff and fully maintained state-of-the-art equipment to support research activities as described in the Mission.

## Mechanical Testing

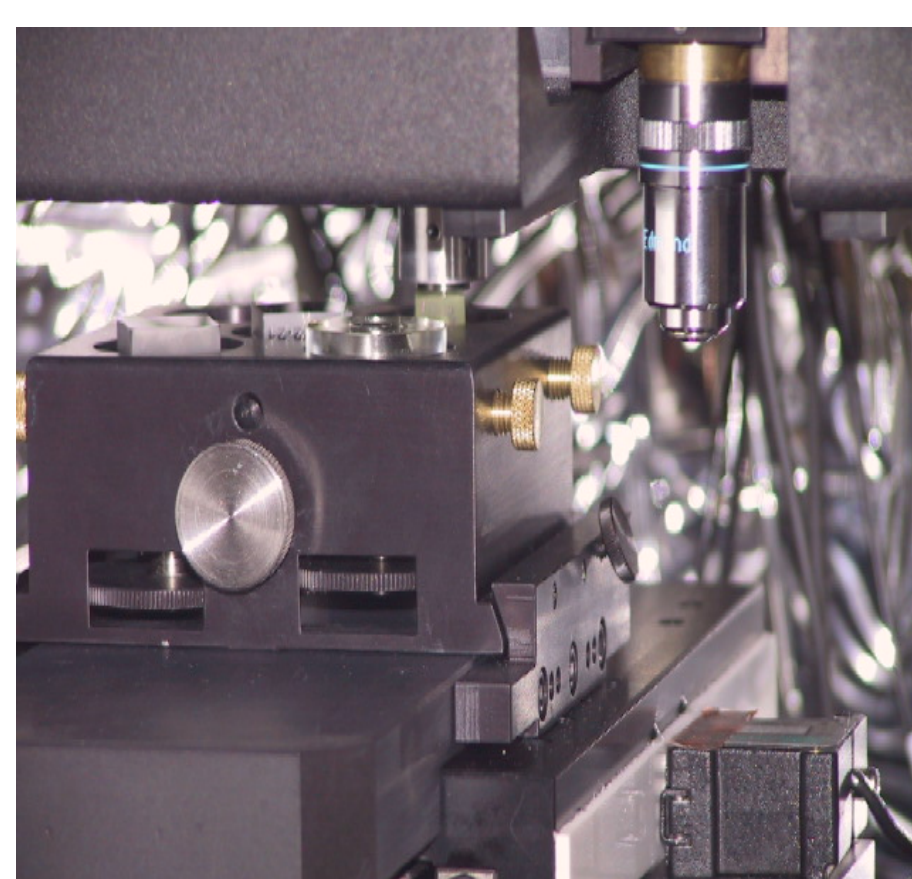


### MTS 858 MiniBionix

Available for high force testing (tens to thousands of pounds), single overload and cyclic modes. Extensometer, strain gauges and a high speed infrared camera available for displacement measurement. Strength and stiffness measurement



**Bose Testbench** Available for low force testing (gram–22 N) & small deformations (microns–mm). Non-contact strain measurement system and dynamic mechanical analysis (DMA) are also available.



**MTS G200 Nanoindenter** Berkovitch diamond indenter tip to probe surfaces, providing hardness and modulus at a micron scale. Continuous stiffness measurement (CSM) and topographical mapping of output measures.

## Impact & Wear Testing



**Drop Tower / Linear Impactors** provide impact forces, energy absorption during impact events.



**AMTI Orthoped Friction & Wear Tester** 6-station pin-on-disk device allows variable forces and wear patterns for submerged specimens in a heated bath; friction coefficients are provided by three triaxial load cells for screening of materials for joint replacement & other applications.

## Example Projects & Collaborators

**Impact characterization of new composites** – Uday Vaidya, PhD, Material Science & Engineering

**Characterization of mouse cartilage in an osetoarthritis mouse model** – Rosa Serra, PhD, Pathology

**Wear testing of nanostructured diamond coatings for TMJ implants** – Yogesh Vohra, PhD, Physics

**Nanoindentation properties of bone-implant interfaces** – Jack Lemons, PhD, Dentistry

**Effects of repeated insertion on pull-out strength in metaphyseal bone** – Brent Ponce, MD, Orthopedic Surgery

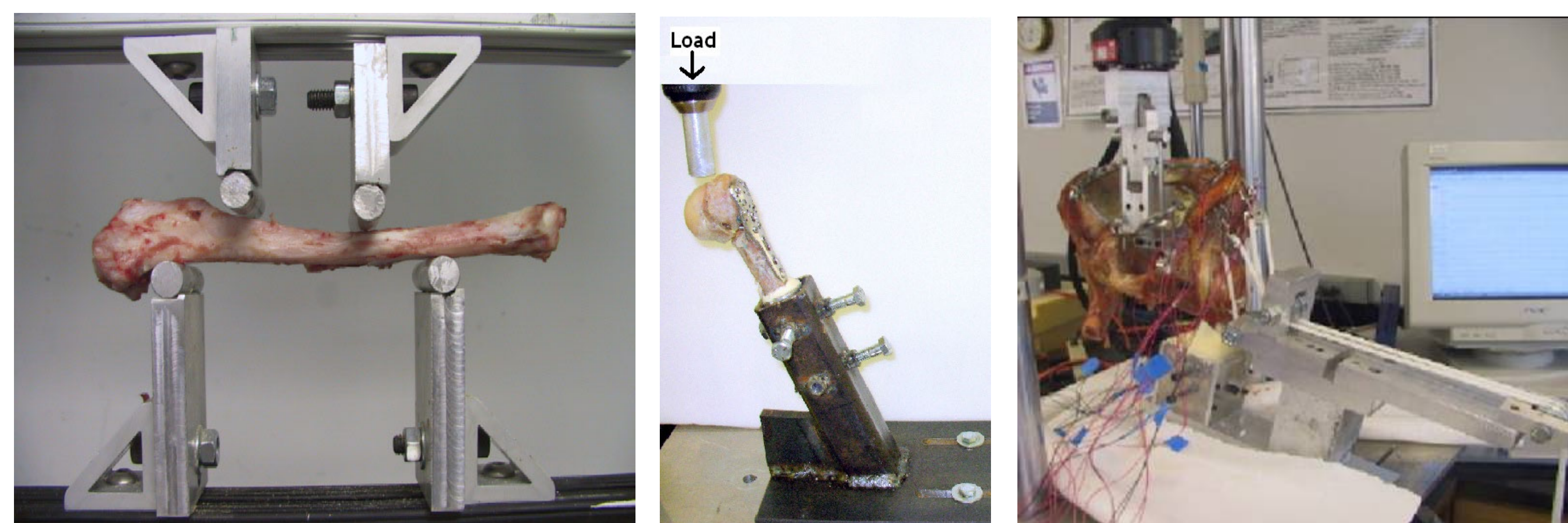
## Acknowledgements

The Director gratefully acknowledges support from the following:

**National Institutes of Health  
National Science Foundation**

**Division of Orthopedic Surgery  
Dept. of Biomedical Engineering  
School of Engineering**

## Example Tests



**Four-point bend testing of a dog tibia (left)  
Varus collapse testing of plated humerus (center)  
Single legged stance of instrumented pelvis (right)**

## Fee Structure & Contact Info

Full day, equipment only (except Orthoped):	\$250
Half day, equipment only (except Orthoped):	\$125
Full day Orthoped:	\$50
Half day Orthoped:	\$25

Training/instruction (Eberhardt)	\$75/hr
Training/assistance (Lab Coordinator)	\$20/hr

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