Hofstra School of Engineering Laboratory Equipment

Engineering Laboratories:

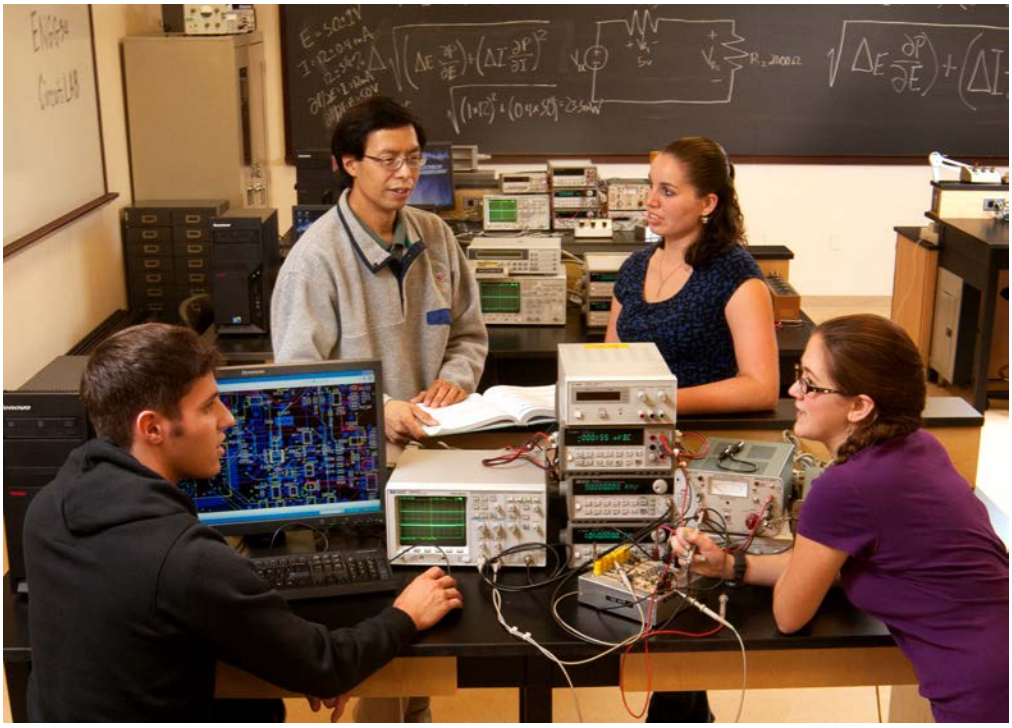
Facilities for the Engineering Department include ten laboratories, three for all engineering majors and seven designed to support the specific needs of the individual majors as listed:

- **Biomedical and Electrical Engineering: Ultrasound Research Lab** – This lab contains the following equipment:
    - VUE 400-P Scanning Acoustic Microscope (SAM)
    - ODIS 3-Axis Scanning Software (with VUE 400-P System)
    - Scanning Acoustic Layer Imaging (SALI) Software (with VUE 400-P System)
    - Through Transmission Ultrasonic Transducers (10, 20, 50, 110, 150 MHz)
    - Dual Monitor Computer and Data Acquisition System (with VUE 400-P System)
    - SONIX Micro-Scan Ultrasonic Inspection System
    - PANAMETRICS Model 5800 Computer Controlled Ultrasonic Pulser-Receiver
    - Dual Monitor Computer and Data Acquisition System (with SONIX System)
    - Q500 – QSONICA 500 Watt Sonicator System
    - Sound Enclosure with Converter Holder (for QSONICA System)
    - Titanium (1/2”, 120 micron displacement tip) Horn-Probe (for QSONICA System)
    - Nikon Eclipse Ti-E Inverted Microscope with Deconvolution
    - Epi-Fluorescence Module (TiFL) (for Nikon Eclipse)
    - Nikon Motorized Stage (TiSE)
    - Systems Condenser-5 Position Motorized (TiCTE)
    - NIS-Elements Research Imaging Software
    - Imaging Workstation Elite i7-Extreme Series
    - INSTRON Model 5967 Biomaterials Testing System, Capacity 30 kN (3000 kg, 6750 lb)
    - Two HP Z420 Workstations with Monitors
    - Air Sentry Fume Hood (Lab Crafters)

- **Biomedical Engineering: Cell and Tissue Engineering Lab** – This lab contains the following equipment:
    - HR-1 Discovery Rheometer – Demo Model, HR-2 Discovery Rheometer
    - DHR & AR-Series Smart Swap Peltier Plate
    - 260 Connex 3D Printer Bundle
    - BF 200 with 200 well interface
    - Primo Vert with integrated monitor
    - Axio Observer Z1 Stand Mot.
    - Scanning Stage 130x85 mot. P; CAN
    - X-Cite 120Q Iris FL Light Source
    - Incubator XL S1 with CO2 Kit for Axio Observer
    - ApoTome.2 slider for Axio Observer
    - Axio Observer.A1 12V/100W Package
    - Attune Acoustic Focusing Cytometer
    - Stepone Plus 96 Well RT PCR System, Laptop
    - BD FACSVerse 2L 6c System with Acc Kit
    - MFP-3D-BIO Atomic Force Microscope
    - Nanodrop 2000 with Laptop
    - CorSolutions PeriPump

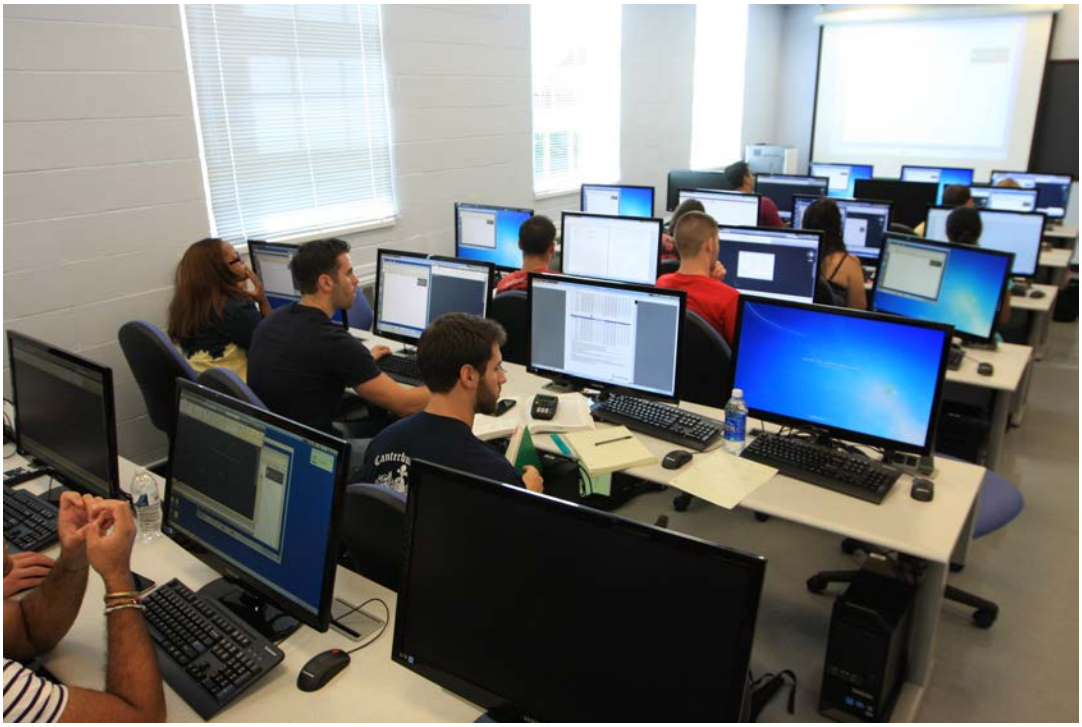
- **Civil Engineering: Civil/Environmental Engineering Lab** – This laboratory is used for instruction and experiments in the environmental engineering component of the civil engineering program. In the lab, the measurement of engineering properties of soils and for examining the selected environmental treatments for water and wastewater.
    - Sieve Shaker
    - Proctor compaction apparatus
    - Hach Spectrophotometer
    - Incubators
    - Armfield Aerobic digester

- **Electrical Engineering: Electrical and Signal Processing Lab** – This laboratory is used for the teaching of introductory and advanced level electrical engineering concepts, including the design of electronic and digital circuits. All engineering students utilize this lab in their introduction to electrical engineering through hands-on instruction in oscilloscope use, transient and steady-state analysis, and the design of operational amplifiers.
    - Digitized Oscillisopes with Spectrum Analyzers
    - Digitized Function Generators
    - Digitized Power Supplies
    - Digital Circuit Design and Microcontroller Boards
    - Computers for Data Acquisition and Computer Aided Design (CAD)



- **Engineering: General Engineering Lab** – This laboratory is used for teaching of the lab sections of ENGG 015: Designing the Human Made World. Students in the course meet in teams weekly in the lab and perform hands-on design experiences. These design experiences culminate at the end of each semester in the grand design challenge, a team-based design competition.

- **Engineering: Engineering Computer Lab** – This laboratory is used for the instruction of specific engineering-based software packages. When the laboratory is not being utilized for instruction, it serves as a general computer laboratory for all engineering students.
    - 40 work stations
    - Software includes: AutoCAD
    - MatLab
    - Comsol
    - STAAD
    - Other engineering design software



- **Mechanical Engineering: Fluids Engineering Lab** – In this laboratory, mechanical engineering students perform experiments in fluid mechanics. The subsonic and supersonic wind tunnels as well as the water channel and water table are used for hands-on instruction in laboratory experiments.
    - Low turbulence subsonic wind tunnel and Mach 3.2 supersonic wind tunnel (with data acquisition)
    - Water channel for open channel hydraulics
    - Water table for flow visualization and shock simulation

- **Mechanical Engineering: Materials Lab** – This laboratory is utilized by all students in the civil and mechanical engineering programs in a laboratory course on the experimental determination of the properties of engineering materials. The laboratory equipment is used to apply axial, flexural, and torsional stresses to test samples as well as non-destructive testing of materials.
    - Tinius Olsen testing machines (one large frame, one small frame)
    - Heat treatment furnace
    - Com-ten bench-top materials test stand
    - Rockwell hardness tester
    - Metallurgical sample preparation equipment
    - Metallurgical microscope

- **Mechanical Engineering: Thermal Engineering Lab** – This laboratory is used for instruction of mechanical engineering students in the design of systems that produce power or refrigeration. Laboratory experiments are designed for applying the theories of thermodynamics and thermal engineering with thermal and energy equipment.
    - Heat exchangers
    - Air conditioner design testing unit
    - Heat pump
    - HVAC design tools

- **Mechanical Engineering: Robotics and Advanced Manufacturing Lab** –This lab was created in 2014 for all students in the School of Engineering and Applied Science to give them experience in multidisciplinary systems engineering with a combination of academic rigor and best industry practices. The lab will instill a human-centered, model-based approach to real-world problem solving and rapid prototyping. Equipment in the lab includes:
    - Complete six-work-cell automation facility with two robots, conveyor, and vision system
    - Ten two-person lab stations with the latest measurement and control hardware and software
    - Mechanical prototype tester;
    - Coordinate measuring arm
    - Laser cutter
    - Three-dimensional printer
    - Printed circuit board fabricator

Computer Science and Computer Engineering Laboratories:

The Department of Computer Science underwent a major facilities renovation in 2014 during which the following six labs were built:

- **Big Data Lab** – This laboratory is used for advanced classes in data analytics, semantic web, distributed computing, security, operating systems and networking classes. It is equipped with:
    - 1 64 CPU
    - 21 x Big Data Servers (420TB combined servers storage, 20TB per big data server)
    - 20 x Linux Workstations
    - 10 x 10TB NAS storage (100TB combined)
    - 5 x routers/switch
    - 2 x 60TB of High Performance SAN storage
    - 60KW UPS.

- **Gaming and Graphics Lab** – This laboratory is used for gaming, graphics, and real-time rendering classes. It is equipped with:
    - 16 graphics machine with NVIDIA GeForce graphics cards, Unity game developing software.

- **Computer Architecture and Embedded Systems Lab** – This laboratory is used for computer architecture, embedded systems, assembly language, mobile application development, and robotics classes. It is equipped with:
    - 15 Macs.
    - 2 Calliope autonomous robots with camera and robotic arm.
    - Apple iPads and Samsung tablets.
    - Digitized Oscilloscopes with Spectrum Analyzers
    - Digitized Function Generators
    - Digitized Power Supplies
    - Digital Circuit Design and Microcontroller Boards (EasyAVR and BigAVR Microprocessor boards, Easy 8501 development boards)
    - Rasberry PIs.
    - Protoboards.

- **Systems Lab** – This laboratory is used for advanced classes such as Artificial Intelligence, Data mining, Database systems, Software Engineering, and Web application development. It is equipped with:
    - 21 Windows machines with specialized application software such as Microsoft MSDNA development software and Matlab.

- **Linux Lab** – This laboratory is used for introductory programming classes. It is equipped with:
    - 30 machines with Linux operating systems and associated software development tools for Java, Python, C++.

- **Research and Innovation Lab** – This laboratory is for entrepreneurial and research projects.
    - 1 server.
    - 4 Linux/Windows machines.