UNLV | HOWARD R. HUGHES COLLEGE OF ENGINEERING

CAPABILITY STATEMENT: ELECTRICAL ENGINEERING & NANOTECHNOLOGIES
INSTITUTION: UNIVERSITY OF NEVADA, LAS VEGAS, HOWARD R. HUGHES COLLEGE OF ENGINEERING

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OVERVIEW

UNLV supports planning, designing and developing circuits, sensors, and communication hardware as related to the Civil Space programs. Additionally, we test these components and systems to assess their ability to withstand thermal and mechanical shocks.

RESEARCH CAPABILITIES

Networking and System Integration Laboratory (NSIL):

The electronic testing and measurement equipment consists of PCB and IC testing instruments and 500-MHz oscilloscope. Other relevant equipment includes:

- Multi-FPGA-based network-on-chip emulation platform,
- Network adapter optics instrument,
- Optical spectrum analyzer,
- Optical power meter,
- Laser sources,
- Vibration isolation tables,
- Fiber positioning system,
- 1x4 channel DWDM MUX/DeMUX,
- 10G DWDM SFP+ modules, and
- IC manufacturing equipment includes: lithography, sputtering machines, electroplating machines, and bonding machines.

Laboratory for Security Science and Engineering:

This laboratory is equipped with

- Traveling wave optical parametric amplifier,
- Femtosecond higher power laser,
- YAG lasers (2 units),
- 1064 nm base band wavelength,
- Semiconductor lasers,
- AIGaN laser diodes with external cavity resonator,
- Pulsed ruby laser with customized optics layout,
- Pulsed Nd YAG laser,
- THz generation and detection,
- Semiconductor parameter analyzer,
- 40 GHz spectrum analyzer,
- 40 GHz sweeping signal generators,
- 30-port vacuum chamber,
- 10-kV pulser,
- Nanosecond/sub-nanosecond electrical, optical, and X-ray detection.

Nanotechnology Cleanroom:

The room is equipped with micro and nano fabrication systems as well as characterization systems. Equipment includes:

- Class 10,000 and 1,000 cleanrooms,
- WS-650 spin coater,
- Vacuum oven,
- 3436 diaphragm vacuum pump,
- 2100 HF high frequency high-power amplifier,
- Plasma cleaner,
- Electrometer,
- UV light sources,
- Nano flow sensor,
- TE inverted fluorescence microscope with CCD camera,
- Customized contact angle measurement platform,
- Pressure sensor,
- Laser cutting machine,
- High-power probe ultrasonicators,
- Thermal bonding press,
- Chip PCR machine,
- Water bath, and
- Gel electrophoresis.
- Fabrication capabilities include: atomic layer deposition, electron beam evaporation systems, photolithography, etching, sputter coater, spin coater, electrochemical fabrication unit, PECVD, thermal CVD, and mask aligners.

PAST PERFORMANCE

Air Force Research Laboratory, National Security Technologies, National Science Foundation, Defense Advanced Research Projects Agency (DARPA), Nevada Center of Excellence, Mission Support & Test Services