



CAPABILITIES STATEMENT IN THE AREA OF ADVANCED MANUFACTURING

Navajo Technical University

School of Engineering, Technology and Math
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DUNS No: 0806485610000

Cage Code: 1W1U2

NAICS ID(s): 541330,541360, 541380, 541715

Federal EIN No: 85-0303705

Certificates, Registrations, Accreditations: HLC, ABET, AVMA

PROFILE: NTU is the first and only ABET-accredited Tribal University obtaining this distinction in the Fall of 2018. The students that attend NTU come from an economic landscape that features a 23% unemployment rate and a poverty rate near 42%. As a result, many of the people and the communities of which they reside are trapped in cycles of poverty that have limited their ability to access the resources needed to sustain a healthy way of life. NTU has taken the lead in reversing such trends with both its academic programs and its community efforts, which is evident in the number of people investing their time and money to obtain an education close to home. As NTU's infrastructure expands, enrollment is expected to increase exponentially as well as our impact in academia, research, and community outreach.

The foundation of NTU's identity as a higher education institution of the Navajo Nation is rooted in the Diné Philosophy of Education. The philosophy of Navajo Technical University is Nistáhákees, Nahátá, lina, Siihasin. NTU believes that every student has the innate ability and intelligence to acquire academic and technical skills. Students need to have knowledge about their abilities and skills to enhance their personal, social, economic and cultural values. A disciplined learning environment, with innovative and viable community-based academic and vocational curricula, will produce a competent, educated, and self-reliant participant of the Navajo Nation in the world of work.

EXPERTISE: Dr. Monsuru Ramoni, Assistant Professor in the NTU Industrial Engineering, and has his Ph.D. Industrial engineering from Texas Tech. He has two MS degrees, MS Manufacturing engineering from the UK and MS Industrial Engineering from the US. Dr. Ramoni has received grant from NASA, and involved in research grants from NSF, ARL. His expertise includes design, sustainable and advanced manufacturing.

RESOURCES: NTU established the NTU Center for Advanced Manufacturing (NTUCAM), formally the Center for Digital Technologies, whose director is Mr. Halliday. The NTUCAM is equipped with state-of-the-art technology for Additive Manufacturing and supporting technologies for the AM eco-system (CAD, Simulation, AM machine operation/maintenance, post-processing/machining, metrology and material properties & characterization).

NTUCAM has the following resources to support academic research and Industrial applications:

- A suite of software including Creo, SolidWorks, ANSYS, Netfabb and Materialise Magics RP with Structures module to accomplish CAD and Simulation.
- AM equipment at NTU includes several Polymer machines (Markforged (2), Makerbot Replicators (5), Projet 3600, Objet 30 Prime).
- 3D metal printing machine or (AM metal equipment); DED metal machine (Optomec LENS MTS 500 Hybrid Controlled Atmosphere system with machining capabilities).
- Post-processing equipment includes a CNC mill, a CNC lathe, EDM, and a CNC Horizontal Band Saw.
- Metrology capabilities include Coordinate Measurement Machines (CMM) (a Hexagon Metrology 4.5.4 and a Quest 650 multi-sensor), portable CMMs (FaroArm with laser scanning attachment and laser tracker), laser scanning (2 Faro focus 3D scanners), white light scanning (HDI), and various standard metrology equipment. NTU will house its metrology and materials testing equipment in a brand-new facility with environmental controls and will soon have ISO 17025 and Nadcap certifications. Software includes PCDMIS, Cam2, Verisurf, and Spatial Analyzer.
- Non-destructive evaluation equipment; CT Scanners (NSI X3000 225 kVA, a Wenzel 80kVA), Keyence VHX 6000 3D Microscope and a JEOL SEM. Software includes Volume Graphics, Geomagic and Quartis. NTU has complete metallurgical specimen preparation capabilities.
- NTU also has Instron Tensile/Compression and Dynamic testing equipment for material testing.



Polymer AM Lab



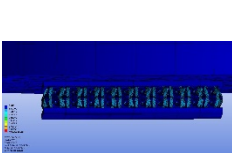
Materials Sample Lab



Metrology Lab



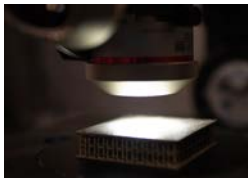
Materials Testing Lab



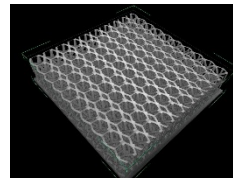
ANSYS Compression Simulation



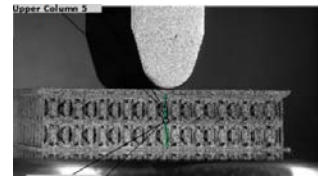
Ti6V4Al Lattice Structure Metal Prints EOS M290



Surface Analysis of Lattices using Keyence VHX6000



CT Scanned Data Lattice Structure



Material testing using ARAMIS SRX Digital Imaging Correlation