Course Name: Introduction to Solar/Photovoltaics

Lead Faculty: Raymond Griego

School: Navajo Technical University - **Mission Statement -**Navajo Technical University's mission is to provide University readiness programs, certificates, associate, baccalaureate, and graduate degrees. Students, faculty, and staff will provide value to the Diné community through research, community engagement, service learning, and activities designed to foster cultural and environmental preservation and sustainable economic development. The University is committed to a high quality, student-oriented, hands-on-learning environment based on the Diné cultural principles: *Nitsáhákees, Nahátá, Íína, Siihasin*.

Delivery Mode(s) for Intro to Solar Course (i.e. face-to-face, online, hybrid, etc): Face to Face

Course Duration (semester, trimester, quarter, short-course, etc.): one semester course ERS 102-01 Photovoltaic Theory and Design, 3-hour credit, prerequisites ELC 101 Electrical Theory and MTH 121

# of credits for the Intro to Solar course: 3

Program Name: Energy Systems

When did the program start? This program was first introduced and adopted in 2002 as a 1-year certificate program. The development of the curriculum was encouraged and funded by the NASA, United Negro College Fund, Special Programs, Curriculum Improvement Partnership Award Program, CIPA. The Energy Systems program is intended to assist and to provide new emphasis to the areas of applied science, mathematics, technology and engineering for students at our tribal college, Navajo Technical University.

Students learn the fundamentals of electricity, magnetism, photovoltaic electrical systems, and wind generation with emphasis in techniques to harness the earth's renewable energy sources. Moreover, the design and construction of photovoltaic, wind and hot air solar heating systems enables students to supplement existing energy needs at home, in their communities and throughout the Navajo Nation.

In 2004 the program expanded from a 1-year certificate to a 2-year AAS degree program. A couple of years ago we partnered with Arizona State University; The NTU/ASU partnership was mentored by the Department of Energy, the National Renewable Energy Lab and Sandia National Lab and is supported by

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

the American Indian Research and Education Initiative (AIREI), the American Indian Science and Engineering Society (AISES) and the American Indian Higher Education Consortium (AIHEC).

What geographic area do your students come from? Navajo Reservation, New Mexico and Arizona

Number of Students in Program: 29 as of fall 2018

Demographics: Percentage distribution

Gender

Male: 25

Female: 4

Ethnicity: Navajo, Native American

What percentage if known - Veterans: Veterans: 1-3%

Degree(s)/ Diplomas(s) / Certificate(s) Offered: Two year AAS degree

How Many Faculty teach solar courses at your college (note if FT or PT)? One

Description of Your Facilities (be sure to note any special lab facilities used for hands-on training): Modular Building, 1500 sq. ft. Classroom and Lab combined

Have you conducted a job market assessment? If yes, what were the findings?

The job market assessment was conducted several years ago by the program's advisory committee. The outlook was and is still very positive. Most of the work is the Albuquerque, Denver and Phoenix area. Most of our students are not willing to travel and prefer to stay close to the Navajo Reservation.

What do you think makes your program successful? Word of mouth, NTU advertisement (radio and newspaper)

What are your industry ties? (If you have an industry advisory board, please describe its size and composition).I have an informal advisory committee:

Committee Members:

Johnny Weiss-Solar Consulting (Co-Founder Solar Energy International)

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Tim Willink, Grid Alternatives

Sandra Begay Campbell, Sandia National Laboratories

Dr. Stan Atticity, Sandia National Laboratories

Lee Otteni, Bureau of Land Management

Steve Chischilly, NTU Faculty (Environmental Science)

A. M. Kannan, PHD, Department of Engineering, Arizona State University

Ed Eaton, Our Sun Solar

Odes Armijo-Caster, Sacred Power Corporation

Honorable Mention

Mark Fitzgerald, Institute for Sustainable Power (instrumental in the creation of the program; deceased)

Do you offer internships? What is your placement rate? We do not require internships as part of the program. However, students have the opportunity to apply for internships, and have obtained internships with the DOE, Sandia National Laboratories, NASA, and USDA. .

Fifty percent of the program's AAS graduates continue their education to pursue a 4-year degree in engineering here at NTU; 16% are placed in jobs in the energy workforce.

Program Link : www.navajotech.edu

This material is based upon work supported by the National Science Foundation under Grant No. 1600934.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.