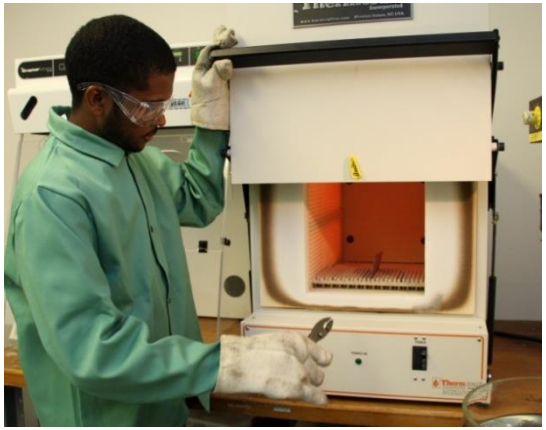
NUCOR –Education and Research Center (NERC)

The Nucor Center of Excellence at Tuskegee University is comprised of three main components: Education, Research, and Outreach. It provides engineering graduates with basic and applied knowledge of steels and their related technologies.

Educational Component

This involves the development and implementation of several courseware modules, short courses, and technical seminars. Modules are being developed for integration into graduate and undergraduate courses. These courses will be taught as technical electives.

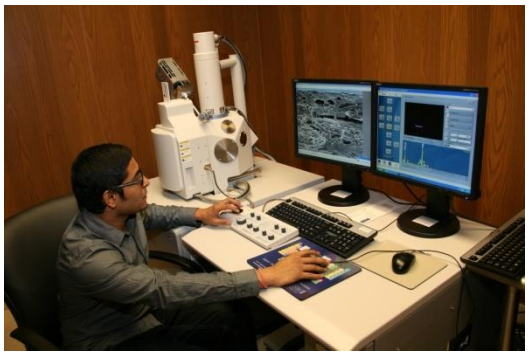


Research Component

The program is designed to stimulate the awareness, interest, excitement, and confidence of outstanding undergraduate students in real-world industries such as steel manufacturing and lead them into careers in metallurgy and emerging steel processing technologies.

Research topics include:

- Heat treatment effects on the impact fracture toughness of steels and their alloys
- Effect of boron on microstructure-properties relationship of structural steels
- Ladle Metallurgy Furnace (LMF) alloy and transition optimization
- Microstructural and mechanical properties of single vs. double rebar
- Accelerated corrosion studies on enameled and galvanized steels
- Improvement of wear, strength, and corrosion resistance of steels using nano-coatings



Tuskegee University has built strong capabilities and infrastructure to address these research activities. This includes the acquisition of optical, scanning electron, and atomic force microscopes, servo-hydraulics and electro-mechanical materials testing systems, equipment for corrosion and heat treatment studies, nondestructive imaging systems, X-ray photoelectron spectroscopy and secondary ion mass spectrometry, etc. Participating faculty will be provided two-month summer appointments and will be required to fully engage in the center activities, including publication of the research results and writing proposals to other funding agencies to insure the NERC sustainability.

Outreach Component

Students attending pre-college summer programs at Tuskegee such as MITE-I, MITE-II, FASTREC-I and FASTREC-II are exposed to the NERC's activities through structured hands-on experiments, workshops, and interactions with graduate and undergraduate students.

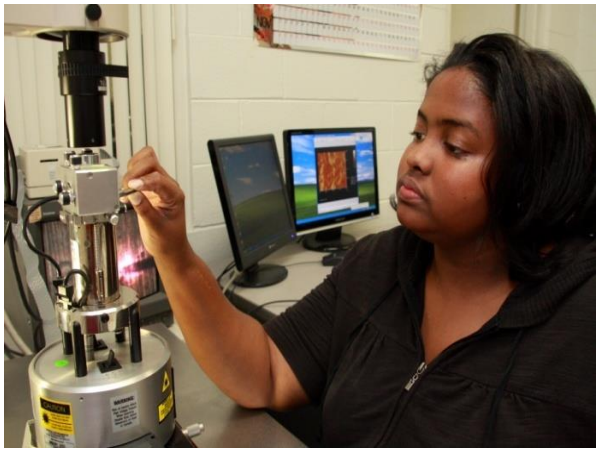
Local middle and high school students, through linkage and outreach programs, participate in key applied research activities to develop a culture of knowledge and awareness among students with a focus on emerging areas of steels and their technologies. Partnering is planned between NERC and the Alabama Math, Science and Technology Education Coalition (AMSTEC) to reach out to K-12 institutions throughout the state of Alabama.

Assessment

Participating students are required to submit a final report outlining the student's research and/or design findings. The report should be of high quality to enable the student to earn three credit hours towards his/her engineering degree. An oral presentation is also required with the participation of Nucor representatives. Appropriate research findings will be submitted to refereed journals.

Leveraging of Resources

In addition to the funding provided by Nucor, synergistic research activities, funded by the Federal Railroad Administration, NSF, Raytheon Company, Boeing, Missile Defense Agency, and John Deere, are leveraged to provide extra resources for the center.



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