Welcome Future Engineers!

The College of Engineering is an integral part of the learner-centered community at North Carolina A&T State University, and for many years we have been the leading producer in the country of African-American engineers at the bachelor’s level. In addition, we are ranked third in the production of Master’s degrees and first in doctoral degrees.

The College of Engineering offers eleven programs in which students may pursue a degree. They are Civil Engineering, Architectural Engineering, Bioenvironmental Engineering, Electrical Engineering, Computer Engineering, Geomatics, Industrial Engineering, Interdisciplinary General Engineering, Mechanical Engineering, Chemical Engineering and Computer Science. Additionally, engineering students conduct cutting edge research in nationally recognized research centers and institutions located on our campus.

Please visit our beautiful campus, and more specifically the College of Engineering as you come to a decision about your education. Come and experience “Aggie Pride” and the “Engineering Experience” at A&T.
Engineers make things happen all over the world. They are the designers of virtually everything in life that must be built. They design concepts to entertain us and buildings to house us comfortably and safely. Our graduates have earned a reputation and designation they wear with pride throughout the world: Aggie engineers. A&T graduates conduct research for NASA, the Department of Defense, and many other world-changing organizations. They touch virtually every facet of life, and they do it with a skill and pride that come from earning an A&T engineering degree.

A&T engineers are as distinguished in caliber as they are in sheer numbers. Our graduates are highly sought after by industry and government, as well as by graduate and professional schools across the country. A leader in the field of engineering, A&T is:

- The nation’s leading producer of African American engineers (men and women) at the bachelor’s level. In fact, one out of every ten African American engineers earns his or her engineering degree from A&T
- The third largest producer of African-American engineers with masters degrees and a leading producer of African-American engineers with doctorate degrees
- Women comprise approximately 27% of the students in the College of Engineering, thus ranking 6th in the country in the percentage of degrees awarded to women (35%) and ranking 37th in the number of engineering degrees awarded to women

For many years, the COE has been a leading national producer of African-American and African-American women engineers at the bachelor’s level. Three programs in the college have distinctive features. These include the architectural engineering program, which is the only one of its kind in the state and only one of thirteen such programs in the country; the biological engineering program, which is the only ABET accredited program of its kind at an HBCU; and the Geomatics program, which is the only one of its kind in the state.
The College of Engineering seeks to provide instruction, counseling, program planning, career guidance, and other support services to students to facilitate their growth and success in the academic and professional communities. The engineering curricula provide students with a strong foundation in communication skills, chemistry, physics and mathematics, with the emphasis gradually shifting toward engineering courses in the junior and senior years. The programs strive to develop a sound and broad background in the fundamental areas of engineering and stress the development of design, analysis and problem solving skills. Students develop the ability to apply basic skills and sound judgment to develop safe and environmentally responsible designs in order to economically convert materials and energy into useful products for the benefit of society. All engineering curricula include a senior design experience that integrates technical and professional knowledge and skills.

The specific educational objectives of the College of Engineering are:

- To prepare the student for an active career in his/her chosen discipline
- To provide the student a comprehensive background in all phases of the engineering design process
- To provide the student a basic knowledge of the mathematical and natural sciences upon which the practice of engineering depends
- To develop the student's ability to analyze and interpret data
- To improve the student's communication, interpersonal and teamwork skills
- To develop the student's understanding of professional and ethical responsibilities
- To develop the student's judgment to effectively and economically use the materials and forces of nature for the benefit of humankind
- To develop an appreciation for lifelong learning in each student
- To develop in each student an awareness of social, political and global issues that impact the engineering profession
- To develop the student's ability to effectively use modern technology.

The College of Engineering consists of five academic departments that offer eleven undergraduate and nine graduate degree programs, namely:

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<th>DEPARTMENT</th>
<th>DEGREE PROGRAMS</th>
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<td>Civil, Architectural, Agricultural and Environmental Engineering</td>
<td>B.S. in Architectural Engineering</td>
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<td>Industrial and Systems Engineering</td>
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<td>Mechanical and Chemical Engineering</td>
<td>B.S. in Chemical Engineering</td>
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Seven engineering programs (architectural, biological, chemical, civil, electrical, industrial and mechanical) are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The computer science program is accredited by the Computer Accreditation Commission of ABET.
The academic programs help you to develop the judgement you need through practical experiences such as internships, co-ops and study-abroad opportunities, and encourage you to develop an appreciation for the process of continuing education. Enrichment activities seek to develop the whole student-intellectual, professional and social-to enable you to become a responsible leader in your community.

Housed in five buildings including the Ronald E. McNair Hall, named for the A&T graduate and famed NASA astronaut, the College of Engineering is home to an exceptionally talented faculty working to develop innovative curricula and creative research to stimulate student interest in learning. Students in the engineering college work with professors and other students to conduct research for agencies such as NASA, National Science Foundation, Department of Defense and other federal agencies.

The college’s interdisciplinary centers include the Center for Energy Research and Technology, Center for Composite Materials, Research Center for Aerospace Research, Center for Human-Machine Studies, Center for Advanced Materials and Smart Structures and the Rockwell Solid State Electronics Laboratory.

To learn more about your major of interest, please visit www.eng.ncat.edu
Possible career paths include:

**Architectural Engineering**
- Energy and Building Systems Engineering
- Structural Design/Engineering
- Facilities Planning and Management
- Electrical Systems and Lighting Design
- Architectural Design
- Construction
- Research and Development

**Bioenvironmental Engineering**
- Research and Development
- Biotechnology
- Environmental Inspection

**Chemical Engineering**
- Biochemical Engineering
- Biotechnology
- Pharmaceuticals and Medicine
- Environmental Engineering
- Production and Process Engineering
- Research and Development

**Civil & Environmental Engineering**
- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Water Resources Engineering
- Research and Development

**Computer Engineering**
- VLSI Design
- Fault Tolerant Computing
- Automatic Logic Synthesis
- Reconfigurable Computing

**Computer Science**
- Application Programming
- Systems Analysis
- Software Engineering
- Systems Programming
- Network Administration
- Database Administration
- Sales Support Engineering
- Research and Development

**Electrical Engineering**
- Automatic Control
- Digital Systems
- Electronics & Microelectronics
- Electrical Power
- Communication & Signal Processing
- Computer Networking

**Geomatics**
- Professional Land Surveying
- Photogrammetrist / Remote Sensing
- Geographic Information Systems Directing
- Geodesist
- Land Developing
- Construction Engineering

**Industrial & Systems Engineering**
- Systems Integration
- Manufacturing/Production Systems Engineering
- Ergonomics and Human Factors
- Logistics and Transportation
- Management Systems Engineering
- Systems Analysis
- Research & Development

**Interdisciplinary General Engineering**
- Sales
- Engineering Management
- Patent Law
- Technical Service Support
- Human Resources
- Education
- Entrepreneurship
- Industrial Design

**Mechanical Engineering**
- Energy - Thermal Systems Design
- Fluid Systems Engineering
- Manufacturing and Machine Design
- Robotics
- Material Science and Engineering
- Aeronautical & Aerospace Design
- Research & Development
Helping Orient Minorities for Engineering (HOME) Program

The COE also offers the Helping Orient Minorities for Engineering (HOME) Program, a summer bridge program for rising freshmen. This summer program is a five-week residential program in which students enroll in a pre-calculus or calculus course, along with freshmen survival courses. Representatives from the Center for Academic Excellence, along with representatives from the Office of Career Services, conduct workshops on personal and career development.

ELITE Living and Learning Communities - The Aggie Engineer Living and Learning Community (LLC) is a community of 68 engineering and computer science freshmen who are assigned to the same floor in a residence hall. Most of these students are assigned to the same course schedule, which facilitates group study in the residence hall. Additionally, most of the COE curricula are common for the first year. The goals of this living and learning community are to: 1) provide for successful personal, academic and professional achievement in a conducive learning environment outside of the classroom, 2) provide opportunities for collaboration among students, faculty and staff, and 3) provide student leadership opportunities for upperclassmen. Upperclassmen who live in the residence hall serve as mentors to the freshmen. In addition to the conduciveness of the environment, supplemental instruction and online tutoring are provided for students in the living and learning community.

Aggie Mentor Program - AggiEmentor is a free service that pairs NC A&T Science, Technology, Engineering, Mathematics (STEM) students with Aggie alumni for the purposes of mentoring. This program provides opportunities for one-on-one mentoring via the internet and e-mail. Current STEM students who sign up for this service receive advice and guidance in personal, academic, career, and professional decisions. This service is provided by MentorNet.

Undergraduate Research Opportunities - Undergraduate student retention and progress to graduate school is a critical issue among underrepresented minorities. NC A&T has implemented an undergraduate research program with support from a corporate partnership to enhance research opportunities. The Intel Undergraduate Research Program involves qualified undergraduate students in a hands-on research experience. Key features of this program include a multidisciplinary student cohort that is exposed to a variety of research topics under close mentoring from interdisciplinary faculty. Students are admitted based on competitive standards that include high GPA requirements and strong recommendations from faculty. Unique aspects of this program include active participation from industry for the initial semesters bridged by continuing support from federal programs including the NSF NC-LSAMP program.

Retention of undergraduate students in BS degree programs within minority engineering schools is important for the improvement of graduation rates. The Intel Undergraduate Research Program is a mechanism that facilitates both retention and continuing education efforts at NC A&T.

Toastmasters International - NC A&T has two official charters of Toastmasters International on campus. The School of Business and Economics has the Aggie Toastmasters Club and the COE has the Aggie Engineers Toastmasters Club. Toastmasters meetings provide a mutually supportive environment in which every
member has the opportunity to foster self-confidence and personal growth. Through this member club, students improve their communication and leadership skills. Toastmasters meetings are designed to improve public speaking skills while promoting self-awareness skills.

**Internship and Co-op Opportunities** - Each year, nearly 300 companies come to the campus of NC A&T to recruit engineering students. All engineering students are encouraged to register with the Office of Career Services. Through this registration process, students receive coaching on their resumes as well as on interviewing skills.

**Student Organizations** - COE students have a plethora of opportunities to participate in the various student organizations. Each department in the COE has three to four different professional student organizations. Organizations in the COE such as the National Society of Black Engineers (NSBE), the Society of Women Engineers (SWE), and the Institute of Electrical and Electronics Engineers (IEEE) provide personal, academic, and professional opportunities for student development. These student organizations encourage retention by offering various workshops and seminars for student success. In addition, these organizations serve as excellent accountability groups to ensure student success. All organizations, including the Greek sororities and fraternities, require students to maintain a certain grade point average.

**Supplemental Instruction** - Research in engineering education confirms that students who engage in supplemental instruction (SI) experience a higher grade in the course than students who do not participate. The COE has found this claim to be true as well. SI is an academic support program that allows students who have earned an “A” or “B” in the course to serve as a supplemental instructor. These SI’s work 10 hours per week by attending the class, meeting with the professor and conducting study groups. The COE offers SI each semester for students in all freshmen and sophomore level courses as well as engineering courses. The COE faculty are heavily engaged in support of the learning community because they identify, recommend, and mentor the SI’s. During the semester, the faculty and SI meet regularly to ensure the success of students enrolled in the course.

**Science, Technology, Engineering, Mathematics (STEM) Pipeline Outreach**

NC A&T is committed to increasing the enrollment and graduation rates of its students. Listed below are several examples of the K-12 outreach activities that the COE is involved.

**FIRST Robotics** - The COE is committed to inspiring K-12 students to pursue careers in STEM. This commitment is demonstrated through the summer outreach programs and annual special events throughout the year. Students and faculty sponsor design competitions such as FIRST Robotics with area schools. FIRST Robotics Competition is a Lego challenge that involves high school students through the design, construction, and testing of robots to complete a task challenge. The Department of Mechanical Engineering at NC A&T provides high school teams with grants and lab space. In addition, NC A&T students and faculty assist with the design and construction of the robots. NC A&T and local corporate partners sponsor the funding for component parts, materials and supplies, registration fees, travel to competitions, team uniforms, tools, and shop equipment.

**FIRST Lego League State Tournament Championship** - NC A&T is the state tournament sponsor for the FIRST Lego League (FLL), a competition for 9-14
year-olds in the STEM areas. Guided by adult mentors and their own imaginations, FLL students solve real-world engineering challenges, develop important life skills, and learn to make positive contributions to society. This program helps students discover the fun in science and technology. NC A&T has sponsored the North Carolina Tournament for the past four years. The NC FLL competition is held each year at the Greensboro Coliseum.

**Junior FIRST Lego League** - The Junior FIRST Lego League is a competition for 5-9 year-olds in the STEM areas. Similar to the FLL, these students learn about science and math while preparing a project for competition. These students learn valuable critical thinking skills and teamwork skills. NC A&T has sponsored this statewide event for the past four years.

**Bridge Programs for K-12 - Engineer Starter’s Program**
The COE offers the Engineer Starter’s Program (ESP), a two-week non-residential program for middle and high schools students. There are two different sessions of this two-week program. The first session is usually held in the month of June while the second session is held during the month of July. Teachers and staff from local high schools also participate in the program. Students receive instruction in math and science. In addition, these students also participate in field trips at local science centers and corporations.

**Energy Engineer Starter’s Program**
This program is a two-week non-residential program for seventh and eighth graders. The 7th and 8th graders from the ESP program attend the Energy Engineer Starter’s Program (EESP). The EESP exposes students to buildings, energy, and space planning. Students conduct projects that pertain to buildings and conserving energy. In addition, these 7th and 8th graders attend field trips to local energy companies.

**Para-Research Program**
The Para-Research Program (PRP) is sponsored by the Department of Industrial & Systems Engineering and the Institute for Human Machine Systems. This program is designed to give high school students (rising 9th through 12th graders) who aspire to become engineers a head start by exposing them to Human-Machine Systems Engineering and Manufacturing Engineering. PRP consists of laboratory activities and demonstrations. Activities include hands-on experiences in state-of-the-art laboratories on virtual reality; robotics; automated manufacturing cells; multi-media and internet applications; ergonomic designs, group dynamics, and field trips. PRP is a two-week program consisting of two sessions.

**Center for Power Electronics Systems**
This program introduces high school students who have completed either their junior or senior year to power electronics technology. The Center for Power Electronics Systems is a two-week day camp. The participants are provided an opportunity to learn what power electronics is and, perhaps more importantly, to obtain a firsthand look at how the use of electricity may change the future. During the two-week camp, participants learn some of the fundamentals of power electronics and lab safety. Students are given a laboratory project that they work on independently under the guidance of a graduate student mentor. Upon completion of the camp, participants are asked to submit a ten-page essay.
Scholarship Information

University-level scholarships are available to new undergraduate students on a competitive basis. To be considered for university-level scholarships and/or scholarships from a specific academic area a new student must be admitted to the university. The Admissions Office will forward a list of all new admitted students, who meet the minimum scholarship requirements, to the Scholarship Office and their respective Deans’ Office for scholarship consideration. Students receiving scholarships will be officially notified in writing. Depending upon available funds, the minimum scholarship requirements for the College of Engineering are outlined below:

- Have a 3.0 cumulative grade point average.
- Combined SAT score of 1100 (Verbal & Math only) or Composite ACT score of 24 (excluding the writing component)
- Class rank
- Complete the Free Application for Federal Student Aid (FAFSA). This form can be completed online at www.fafsa.ed.gov. Our school code is 002905. The priority date for completing the FAFSA is March 15th of each year.

The university-level scholarships are awarded primarily on academic merits with some consideration given to the student’s financial need. If you have additional questions concerning university-level scholarships you may contact the Scholarship Office at (336) 334-7973. You can also obtain additional financial aid and/or outside scholarship information online at www.finaid@ncat.edu. The Scholarship Office is located within the Office of Student Financial Services on the first floor of the Dowdy Administration Building, 1601 East Market Street, Greensboro, North Carolina 27411.
Aggie Pride is the sense of community among all A&T students, faculty, alumni and staff. Bridging the gap between family life and newfound independence, this feeling of “Belonging to Something Special” connects a community of Aggies from all cultures, backgrounds and experiences.

Aggie Life
A&T offers a variety of student organizations, intramural sports, and leadership opportunities that foster excellence and make for an unforgettable and rewarding university experience. Make lasting friendships through participation in athletics, Greek life, the Register-Student Newspaper, Blue & Gold Marching Machine, ROTC, and much, much more.

Aggie Family
Imagine yourself surrounded by all the resources and experiences of a large university, while immersed in a caring and nurturing community where faculty members take a vested interest in your success. The moment you step onto our campus, you become a cherished member of the Aggie family.

Aggie Spirit
The atmosphere is electrifying at A&T sporting events. Aggie Pride transcends all campus rivalries and brings forth a community of loyal fans and supporters. Whether it is a football game, such as Aggie Homecoming, men's and women’s basketball, volleyball, track & field, cross country, baseball, softball, tennis, swimming or bowling, a support system of blue and gold is assured to be in the stands.

Aggie Edge
Companies all over the world seek A&T students. Many fortune 500 companies, such as Gillette, Merck and others, regularly visit the campus to attract tomorrow’s best and brightest leaders. Set yourself above the rest with the multitude of internships, co-ops, and international opportunities which provide you with the real life experience that recruiters desire.

Aggie Universe
Students attending A&T are able to participate in study abroad, international internships and overseas service learning opportunities. They are available in nearly 200 locations in Africa, Asia, Australia, North America, South America, and Europe.