

I would like to thank Chairman Brooks and Ranking Member Lipinski for allowing me the opportunity to speak today about Calhoun Community College's role in STEM Education and helping to prepare our graduates for the challenge of an ever increasing high-tech workforce. It is very important for STEM Education to be readily available to today's college students and the workforce. Calhoun is the largest community college in Alabama and roughly one-half of our students have declared majors in a STEM program, when you consider all of our health care, technology, biotechnology, and pre-engineering majors.

What role does your institution play in helping the U.S. economy? Please discuss the role of your institution in providing a skilled workforce to the local and regional economy, particularly with regard to STEM fields.

Calhoun Community College is a vital part of the local economy and is recognized as one of the region's most successful economic and workforce engines. The College trains incumbent workers, under-employed workers, and future workers for many of the high-tech, high-skilled, and high-wage jobs located in the north Alabama region.

Over the past 10 years, the Huntsville Metro Area has experienced a 21.5% population increase which is expected to continue due to the Base Realignment and Closure and various corporate expansions and relocations to the area. According to the U.S. Census 2010, Huntsville is Alabama's 2<sup>nd</sup> largest metropolitan area. Area growth is expected to continue through at least 2020.

County	Percentage Growth
HSV/Madison	9%
Athens/Limestone	13%
Decatur/Morgan	5%
Lawrence	0.5%

**Source: U.S. Census and Chamber of Commerce Studies**

Several key area industry sectors include Aerospace and Defense, Electronics, Research and Technology, Manufacturing, and Life Science. The area's top three employers are the U.S. Army/Redstone Arsenal with 30,000 employees; Huntsville Hospital System with 6,280; and NASA/Marshall Space Flight Center with 6,000. All of the industry sectors mentioned are STEM related employers. In addition, there are approximately 11,000 people employed in the aerospace industry; almost 1,000 people employed in the biotech, biomedical, and pharmaceutical fields; and more than 300 international and domestic corporations involved in the design and production of electronics and computer-related technology.

According to an article in the *TechAmerica Foundation*, December 2010, Huntsville's concentration of High-Tech Workers was 2<sup>nd</sup> in the Nation only to San Jose's Silicon Valley (December 2010). The Bureau of Labor Statistics *Monthly Labor Review*, May 2011, identifies ninety-seven (97) STEM specific occupations. (Cover, Jones, and Watson, May 2011) Those include computer and mathematical sciences, architecture and engineering, and life and physical sciences. In addition, the most recent issue of the *Community College Journal* states that "STEM-related job openings are expected to grow by 17% between 2008 and 2018, nearly twice that of all other job fields." (Unknown, April/May 2012) To address this increasing demand for skilled workers in STEM-related areas, Calhoun has developed and enhanced a number of programs.

Currently, the College has 450 students who have declared majors in Pre-Engineering, Science, or Math. In addition, approximately 4,500 students are enrolled in the College's Technology programs. Calhoun is involved in a Postsecondary consortium with UA-Huntsville and Alabama A&M University which allows students to transfer from Calhoun to one of the consortium universities and upon graduation pursue employment with the Missile Defense Agency or similar employers.

In 2007, Calhoun launched the state's first and only Associate degree programs in Biotechnology and Clean Energy Technology. Students majoring in Biotechnology transfer to 4-year institutions or immediately enter the workforce as bio-technicians. Hudson-Alpha partners with Calhoun by providing scholarships for our students as well as internships for those who have completed one year in

the biotechnology program. Through a \$3.4 million grant awarded by the U.S. Department of Labor, Calhoun created the Alabama Center for Excellence in Clean Energy Technology, the first accredited training center for renewable energy technology in Alabama, serving as the State's launch pad for renewable energy technicians.

Realizing that many of today's workforce are in need of additional training or skills upgrades, Calhoun offers short-term training certificates, Associate of Applied Technologies, and Associate of Science Degrees. In an effort to meet the needs of students, classes are offered at the main campus located in Tanner (Limestone County) and also at the Huntsville (Madison County) campus on Wynn Drive, and also on-line through a significant number of distance education and hybrid courses.

Calhoun has successfully pursued grants with the National Science Foundation to better equip STEM programs and to offer scholarships to STEM majors. Currently, the College has a grant award of over \$500,000 with the majority going to students in the form of scholarships.

How do you partner and collaborate with local businesses, non-profits, other schools and institutions of higher learning, and local and state government to create an educated and skilled workforce?

Calhoun Community College has an established Workforce Solutions department that works very closely with businesses and industries to provide customized, flexible, cost-effective and convenient training to businesses and industries in north Alabama. This training allows employees to maximize performance and efficiencies keeping industries in the forefront of the global marketplace.

The College also works with area non-profits, schools, and institutions of higher learning. A recent example would be Calhoun's Workforce Innovation in Regional Economic Development (WIRED) project. WIRED was a \$5M project funded by the U.S. Department of Labor. This project was a regional initiative to develop and strengthen partnerships throughout north Alabama and south-central Tennessee. A total of twenty-three counties participated in the project – nine from Tennessee and fourteen from Alabama.

This partnership included five universities, nine two-year colleges, three county school systems, five non-profits, and three local government agencies. Highlights from the project include:

- 6,554 students educated through Science in Motion
- 3,342 students reached through Junior Achievement expansion
- 4,500 students trained through STEM summer camp activities
- 810 Students, Counselors, and Employers reached through Dream It Do It for technology programs
- 436 STEM scholarships awarded in Undergraduate/Graduate programs
- 251 Dual Enrollment Technology Students received scholarships
- 74 Students trained in A.S. Degree Biotechnology program
- 45 Students received Entrepreneurial Training
- 9 Non-Commissioned Officers enrolled in Engineering programs at UAHuntsville and Calhoun Community College

The majority of the grant funds were used for STEM education, workforce training, and scholarships for students majoring in STEM programs.

Calhoun also has articulation agreements with UAHuntsville, Alabama A&M University, and Athens State University. In addition to these articulation agreements, Calhoun has a reverse agreement with Athens State which increases support for students to complete their associate's degree.

The College works very closely with the Regional Workforce Development Council. A current project is the Career Coaches initiative. With this project, Calhoun and five other community colleges in north Alabama employ Career Coaches to go out into the high schools and work with students to help them determine their educational and career goals. The purpose of the project is not to recruit students to a particular college, but to guide these high school students on the appropriate career path for pursuing their goals.

Calhoun is a full partner with Alabama Industrial Development and Training (AIDT) in the Alabama Robotics Technology Park. This facility is a one-of-a-kind, state-of-the-art training, research/development and entrepreneurship park that

trains students and incumbent workers in the use of current and developing robotics technology. The training ranges from manufacturing work to unmanned air vehicles for space and defense.

In an effort to maintain the most up-to-date course offerings, the College has established advisory committees for each technology related discipline for review of curriculum and to offer suggestions for improvement based on current and anticipated future workforce trends.

What are the major challenges that limit the performance of students in STEM subjects, particularly in their first two years of post-secondary education? What challenges do you face in retaining students pursuing STEM certificates and degrees?

The national Survey of Entering Student Engagement (SENSE) identifies six areas critical to student performance and retention for students entering college. Calhoun administers the SENSE survey each fall and uses the data to ensure effective practices and make improvements when needed. The six critical areas include: (2010)

1. Early Connections with someone at the college;
2. High expectations and aspirations from college faculty and staff;
3. Clear academic plan and pathway that helps students set academic goals;
4. Effective track to college readiness;
5. Engaged learning; and
6. Academic and social support network to obtain information about college services.

The SENSE areas are certainly relevant and applicable to students enrolled in STEM courses. At Calhoun, the lack of preparation for college-level coursework, lack of time management skills to complete required readings/homework assignments, and external work/family obligations causing students to withdraw from courses or not attend class regularly are issues continually being addressed to help students complete certificates or degrees.

Community college students are as diverse as the career paths in science, technology, engineering and math. Recent high school graduates may enter

college with a high ACT score while the non-traditional community college student could be returning to college after working for 10 years and need some remediation in math and English before being prepared for college-level courses. These differences in “college readiness” make it difficult for instructors to teach to all levels of students. Nationally, approximately 60% of students need remediation in English, reading or math.

College survey data indicate that students do not anticipate the number of hours required to complete reading and homework assignments to succeed in challenging courses such as Microbiology, Physics, and Calculus. Since these courses are fundamental to most STEM undergraduate degrees, students who do not pass these courses may have difficulty transferring to a four-year university.

Work/family obligations cause students to withdraw from courses or not attend class regularly. More than half of Calhoun’s students are enrolled part-time (62% Spring 2012 semester) and most are employed at least part-time. Research shows that students who miss class within the first four weeks of the semester are less likely to succeed in the course or complete their college degrees. This data supports the need for early-intervention programs for these students, such as Calhoun’s Retention Office of Academic Development, or the ROADS tutoring program.

Student retention at Calhoun is above the national average. Approximately 75% of our students are retained from fall to spring semester; fall to fall retention rates average around 55% for first-time, full-time freshmen. Many community college students do not have a designated “major” since they are planning to transfer to senior institutions and may be unsure of specific career goals. Designated STEM majors are often challenged by the curriculum as well as knowledge of transferability issues with particular classes. We also find that students may not be aware of academic support services (e.g., free tutoring, labs). Again, the full-time status for students is extremely critical for college completion. It takes a much longer period of time for students to graduate if they are enrolled in only one or two courses each semester.

A very successful initiative the College has implemented in the last few years is the Career Coach Initiative. The primary goal of the Career Coaches

Initiative is to implement a comprehensive career advisement program targeted towards grades 7-12 graders designed to assist these students with their career aspirations, to recognize postsecondary programs that fit their career goals, and to refer those students to programs that will facilitate students' reaching their desired goals. Activities include providing assistance in completing scholarship and college admission applications, providing resources about internship programs, short-term certificate training and other career opportunities, providing one-on-one career coaching including the development of career portfolios, sharing information about career pathways and connecting students to early college programs such as Upward Bound, Tech Prep and Dual Enrollment.

In addition, Calhoun has more than 100 articulation agreements with area high schools for Tech Prep and Dual Enrollment programs. The college also offers an Early College Entrance Program (ECEP) through partnership with local school systems. The College hosts the annual regional BEST Robotics Competition where high school students compete, and summer camps for high school students interested in technology and healthcare are also offered. A camp introducing high school female juniors and seniors to non-traditional programs (electricity and welding) is also offered each summer by the College.

How do you prepare your students to continue with a four-year degree or enter the workforce upon completion of their academic program?

Calhoun prepares student to continue with a four-year degree by having established articulation agreements with UAHuntsville, Alabama A&M University, and Athens State University. Also, Calhoun uses the Statewide Transfer Articulation and Reporting System (STARS) system to ensure students follow the appropriate curriculum for transfer to Alabama universities.

Additionally, Calhoun has a reverse transfer agreement with Athens State University and is currently working to establish the same type of agreement with UAHuntsville. This agreement allows Calhoun students who have transferred prior to graduation the opportunity to earn an Associate Degree by transferring credits back to Calhoun.

Calhoun prepares students to enter the workforce upon completion of their academic program by encouraging and offering students the opportunity to take

exams for nationally recognized industry credentials. In addition, the College offers apprenticeship and co-op opportunities. Many of these students are hired as full-time, permanent employees upon completion of their educational program.

How can we attract, educate, and retain the critical mass of talent necessary to keep the state of Alabama – and the country as a whole – at the forefront of research, development, and groundbreaking advances in science and technology?

- In order to attract, educate, and retain critical talent in the state of Alabama and the country as a whole, scholarships should be provided for deserving students at both the two-year and four-year level allow for a seamless transition and to encourage college completion.
- Employers should offer incentives to graduates to keep good talent local.
- Employers and area Chambers of Commerce need to assist in student recruiting by providing information on desired skills and talents for careers and future workforce needs.
- Employers and college faculty should serve as mentors.
- More co-op and intern/apprenticeship opportunities are needed.
- State-of-the-art labs and equipment are needed for curriculum support to provide hands-on experiences to students majoring in the STEM fields.
- More career counseling, assessments, and job placement services are needed to assist students in evaluating and determining a career path and developing the best plan to meet their goals.

How can we ensure that we provide sufficient opportunities to allow students, researchers, educators, and employees to become and remain current and competitive in our rapidly evolving world?

It is very important that students, researchers, educators, and employees become and remain current and competitive in our rapidly evolving world. In an effort to ensure this happens, it is very important to work with trade organizations to keep up with industry standards.

Also, education and training should be affordable for all students. As we have all seen in the past few years, the days of working for one industry for a lifetime are over. Today's workforce must be willing and able to adapt to the changing needs of industry.

Calhoun is excited to have an active role in helping to educate, train and develop the workforce our region needs to successfully compete in the global market place.

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