

SpaceTEC[®]

National Aerospace
Technical Education Center

Talk

FALL 2007

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(California)

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(California)

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Community College
(Virginia)

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A Message from the PI...

Times, They are a Changing

In today's world, simply maintaining what has been done in the past is not enough to remain competitive. Organizations and individuals must continually strive for improvement. Change, although not always comfortable, is inevitable. Change also means risk and the aerospace environment is no exception. As the new space companies push ahead, we are reminded of the risk with the recent accident at Scaled Composites. Three individuals died trying to change the industry just as three lives were lost in Apollo 1 when as a nation, we sought to change the world.

Change is visible here at the Kennedy Space Center as NASA begins to ramp up operations in support of the Constellation program. First and foremost, the remaining Space Shuttle flights must be completed safely; however, concurrent work is underway to design the new generation of space vehicles and supporting infrastructure.

The Constellation program will include new spacecraft such as the Orion crew capsule and Ares I and Ares

V launch vehicles. This space system is intended to provide efficient and reliable access to space using a smaller technician workforce which is multi-skilled and knowledgeable of new technologies. To address these changes in technical workforce education, SpaceTEC recently developed and delivered a series of workshops in composites, non-destructive testing, and fiber optics. Demand for these workshops remains high as the technician community prepares for future change.

In addition to the change at NASA, global competition is driving significant change in the military and commercial sectors of aerospace. In the next few years we will see unprecedented change within the aerospace industry, and it will be only those organizations and individuals who embrace the challenge and prepare for opportunities that will succeed. Education is one of the best investments an individual can make to prepare for change, and SpaceTEC is working diligently to meet the current and future education, training, and certification needs of the aerospace technician workforce. The greatest risk will be not preparing for change.

Frank Margiotta
SpaceTEC Principal Investigator

Co-Operation to Meet Workforce Needs

In mid-2006, Calhoun Community College and area manufacturing companies realized that they were both dealing with problems that could best be solved through a mutual partnership.

- There is a future shortage of skilled workers to fill key positions within manufacturing and process industry organizations located in North-Central Alabama.
- Calhoun's Technology program enrollments and number of graduates are insufficient to meet workforce demands for these key positions.
- There has typically been a "single-channel" college recruitment program that has not brought industry to explain their workforce needs and the tremendous career opportunities that are available.

The Co-operation Program is a joint venture among regional manufacturing companies, Calhoun Community College, and students pursuing post secondary degrees and employment in aerospace technology, machining, and process technology. The Program is unique in that 14+ companies, four economic development agencies, and three college programs are collaborating to develop and implement a **joint** cooperative education agreement. This industry-led initiative includes high school recruitment activities and establishing applicant eligibility requirements, cooperative student wages, and end-of-program hiring procedures. The intent is to not only address company-specific workforce shortages but also to "raise the bar" in **overall** regional manufacturing workforce capabilities.

The objective of this initiative has been to develop a process to fill and maintain a "full pipeline" of educated/trained people to fill key technical positions within North-Central Alabama manufacturing organizations and to increase industry participation with the curriculum content and the cooperative student (co-op) marketing process. Students in the Co-operation program would be able to work 20 to 25 hours per week in their field of study while attending school full time. Work assignments will become increasingly more challenging as students gain experience and more technical skills, and pay increases are awarded based on satisfactory performance evaluations at the end of each semester.

Through the first half of 2007, Calhoun and these innovative companies worked to develop a common understanding of the program process addressing eligibility, application, selection, work schedules, pay and performance appraisals. An application process was designed with interviews and selections made by the respective companies.

For each selected student, a three-party agreement is signed by the company, the student, and the College. In fall semester of 2007, twenty four students entered the Co-Operation program, fourteen in Aerospace/Machine Tool Technology and seven in Process Technology. They will be extended the opportunity of employment once the training program is complete. While companies do not guarantee employment at the end of the Co-Operation period, it is likely that with good work and academic performance, students will have great employment opportunities.

Industries involved to date are:

<u>Aerospace/Machine Tool</u>	<u>Process Technology</u>
Automatic Screw Machine/ Decatur	3M/Decatur BP/Decatur
AZ Technology	Calpine/Decatur
Falciani Machine/Huntsville	Solutia/Decatur
Dixie Metalcraft/Hazel Green	IDMC/Snap-on/Elkmont
Cargill/Decatur	Toray/Decatur
United Launch Alliance/ Decatur	
Brown Precision/Huntsville	

For more information on the Co-Operation program go to www.calhoun.edu/Techno/Co-operation.index.html or contact Ann Coleman (256-306-2938 or bac@calhoun.edu)



Co-Op applications being reviewed by industry representatives from Automatic Screw Machine, Falciani Machine, ULA, Snap-on Tools, Dixie Metalcraft, and AZ Technology.

SpaceTEC Supports Civil Air Patrol Groups

SpaceTEC recently hosted two groups of Civil Air Patrol (CAP) cadets during consecutive aerospace education weekends in August 2007. Dr. Tom Steffen and Mr. Robert Ward hosted rocket workshop activities and supported tours of Cape Canaveral Air Force Station. Participants were also provided with an overview of the history of Cape Canaveral, the Space Shuttle program, and the future of space exploration.

The tour of Cape Canaveral Air Force Station included a visit to the Air Force Space and Missile Museum located at Launch Complex 26, site of the first successful launch of an American satellite. Launch Complex 14 and the blockhouse was another stop on the tour. This is the site where Astronaut John Glenn flew aboard Friendship 7 during Project Mercury, successfully placing an American into orbit for the very first time. The group also took time to stop at Launch Complex 34 where Virgil I. "Gus" Grissom, Edward H. White II, and Roger B. Chaffee lost their lives in Apollo 1 when a fire broke out during a simulation.



Cadets participate in a rocket workshop at SpaceTEC

Robert S. Ward joins SpaceTEC as Program Manager



Robert Ward

SpaceTEC would like to welcome Mr. Robert S. Ward as Program Manager. He brings a wealth of experience to SpaceTEC from both the space and aviation industry. Prior to joining

SpaceTEC, Robert was the Vice President of Flight Operations for the Zero Gravity Corporation, the nation's only FAA-certified commercial parabolic flight provider. While at ZERO-G, Robert was instrumental in the modification of two Boeing 727-200s, certification of the operation by the FAA, research flights for NASA and certification to allow individuals with disabilities to experience microgravity.

In addition to his experience with ZERO-G, Robert was a flight instructor with Embry-Riddle Aeronautical University, Project Engineer for the Spaceport Florida Authority and an Adjunct Professor for Brevard Community College and Jacksonville University. He holds a Certified Flight Instructor and Commercial Pilot Certificate with single and multi-engine land, multi-engine sea, and instrument privileges.

Robert started his space career as a human test subject at the Johnson Space Center in Houston, Texas, and has been a space reporter, space camp counselor, and a microgravity researcher. He has a Bachelor of Science Degree in Aerospace Studies and a Master of Science degree in Technical Management from Embry-Riddle.



CAP members in front of a Mercury Redstone rocket at Complex 5/6.

SpaceTEC/JSAMTCC Collaboration

The Joint Service Aviation Maintenance Technician Certification Council (JSAMTCC) comprised of representatives from each service branch met at Whiteman Air Force Base, MO. SpaceTEC Co-PI, J.R. Breeding led the meeting. The JSAMTCC has worked closely with the Federal Aviation Administration to streamline and standardize the process allowing military personnel to apply past experience to qualify for the FAA A&P certification exam. A similar process will be evaluated for the SpaceTEC Certified Aerospace Technician program. After the meeting, members toured B-2 Spirit Stealth Bomber maintenance facilities and composite repair facilities.



L to R: SpaceTEC members J.R. Breeding, Frank Margiotta, and Doug Howse with the Spirit of Louisiana.

Doña Ana Community College Aerospace Technology Training begins this Fall

Launching DACC's new Aerospace Technology Program, Campus Executive Officer Margie Huerta and Starchaser Industries Founder and CEO Steve Bennett recently spoke to local business leaders and community members. Bennett's 37-foot Nova-Starchaser 4 rocket served as a backdrop.

DACC's Technical and Industrial Studies Division began offering Aerospace classes in the fall 2007 semester. The program covers the construction, testing and maintenance of aircraft and space vehicles, Huerta said.



Pictured are DACC CEO Margie Huerta and Steve Bennett of Starchaser.

"We are very happy to be at the forefront in launching Aerospace Technology, developed in response to the community's growing interest in the space industry," she said, adding the curriculum meets the certification requirements of SpaceTEC, a consortium made up of DACC and only 10 other community colleges around the nation that offer such career programs. Core competencies are applied in mechanics, introduction to aerospace, aerospace safety, materials and processes, basic electricity, and tests and measurements.

SpaceTEC - TNCC - NASA Co-op Program

Thomas Nelson Community College is positioning students for careers in the aerospace industry. This fall, a new SpaceTEC™ cooperative education program developed by the College and NASA Langley Research Center is providing federal work experience for eligible students committed to simultaneously earning an associate's degree in either Mechanical Engineering Technology or Electronics with a specialization in Electrical Engineering Technology.

The program provides formal training and salaried on-the-job training as well as a comprehensive benefits package. Fourteen students were selected for the fall semester with paid tuition and books at Thomas Nelson. Those who complete the three-year co-op and pass the SpaceTEC™ certification exam will be considered for entry into a two-year apprentice program at NASA. This will be an ongoing program with 14 students to be enrolled each August.

This is very exciting given that NASA Langley is now working on the new space program at about the same level of its involvement in the 1970s. This is also a great opportunity for the College since NASA Langley is working exclusively with co-ops to handle its increased technician workload and critical skill shortages. Those accepted will gain valuable career experience in a number of areas at NASA including research, flight operations and simulation, fabrication technology and center operation, among other areas that are critical to space exploration.

SpaceTEC® Certified Aerospace Technicians™ Awarded College Credit

Six SpaceTEC® Certified Aerospace Technicians™ are the first to be awarded college credit toward an associate's degree in Aerospace Technology at Brevard Community College. All six have taken advantage of Brevard's approval to grant 25 college credits to individuals who pass the SpaceTEC® Core Certification Exam. A student must first complete his/her general education requirements and are then awarded the college credits. This opportunity allows a student to complete the associate's degree in considerably less time.

The American Council on Education (ACE) has also granted approval for colleges with a degreed program in Aerospace Technology to award up to 24 college credits to any student who has passed the certification exam. This approval was effective April 1, 2007, and will allow other colleges in the SpaceTEC® consortium to award college credit. SpaceTEC® anticipates that many individuals who are not degreed and currently work in the aerospace industry will take advantage of this program.



Pictured left to right are (top row) Frank Custer (USA), MSgt Ronald Linder (USAF), MSgt Timothy Neils (USAF); (bottom row) Michael Carlile (USA), Alan Scoville (ULA) and MSgt Michael VanVorst (USAF).



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To submit information for this publication, or to be placed on the mailing list, please write to the Office of Public Relations, Calhoun Community College, P.O. Box 2216, Decatur, AL 35609-2216, or call 256/306-2561.

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TNCC's SpaceTEC Workshop Shines Light on Fiber Optics

On May 17-18, 2007, Thomas Nelson Community College (TNCC) and SpaceTEC hosted a two-day Fibers Optics Workshop. Approximately 15 attendees participated in the workshop with some coming from as far away as California and Washington while others were local to the Hampton Roads area. Most of the workshop participants came from technical, engineering, or academic backgrounds, and represented the Air Force, Boeing, NASA, and several community college systems throughout the United States. Pat Taylor, Dean of Mathematics, Engineering and Technology at TNCC and CO-PI for the TNCC SpaceTEC program, introduced workshop instructors, Dan Canfield, TNCC Electronics Department head, and James Dallas, Manager of Training, KITCO Fiber Optics Company, Virginia Beach, Virginia.

Canfield began the workshop with a short introduction on safety and provided an overview on the TNCC fiber optics program. He explained that the fiber optics program initially started a couple of years ago with a donation of \$250,000 worth of fiber optics equipment and supplies from a



Sam James explains the art of Composite Models.



The attendees viewed the actual Apollo 16 capsule.

Canadian company.

In the afternoon of the first day of the workshop, Nancy Holloway, NASA-Langley Technician, organized a special tour of the NASA Langley Research Center. During the tour, attendees had the opportunity to visit the Advanced Machining Facility, the Rapid Prototyping Lab, the Composite Models Facility and the Microelectronics Lab.

Attendees saw examples of precision machined, dynamically scaled hardware and wind tunnel models; a full scale mock-up of the Launch Abort System (LAS); hardware and models fabricated via rapid prototype equipment including a Crew Exploration Vehicle (CEV), and Boeing 757; and finally examples of microelectronics circuits, and smart materials which were fully developed, and spun off to industry.

Late in the afternoon, workshop attendees visited the Virginia Air and Space Center (VASC), located in downtown Hampton, Virginia, where they viewed an actual Apollo capsule that was used for the Apollo 16

mission and toured the new Space Quest exhibit which features Mars rovers and landers, actual moon and Mars rocks and scaled-down models of the planets.

On the second day of the workshop, Mr. Dallas led hands-on fiber optics activities sharing a myriad of specialized expertise with the attendees. Attendees were able to practice the techniques with optical fibers and hand tools, preparing the fiber tip with special fine grain polishing paper, and checking the quality of the polished fibers via special microscopes designed for fiber optics. All attendees successfully built two ST connectors and one fusion splicer.

The conference offered a valuable opportunity for participants to learn much about fiber optics, gave the attendees an opportunity to visit NASA Langley Research Center, and helped them learn more about aerospace fabrication in such areas as aeronautics, advanced materials, space, and exploration.



Mr. Dallas provides instruction on Fiber Optic splicing.

Allan Hancock College & Partners Join NASA in “AIM”-ing for Clouds at the Edge of Space

Allan Hancock College and the Endeavour Center, a NASA Educators' Resource Center, welcomed 96 participants over the two-day Aeronomy of Ice in the Mesosphere (AIM) Educators' Launch Conference, beginning April 24 at the college's Lompoc Valley Center. The conference, supported in part by SpaceTEC, included a tour of Vandenberg Air Force Base and culminated in remote viewing of Orbital Sciences' Pegasus XL launch of the AIM satellite into polar orbit at precisely 1:26 p.m. on April 25.

The purpose of the AIM mission is to study Earth's highest clouds, thought to be made up of frozen ice crystals which appear blue to the naked eye at twilight in the spring and summer at high latitudes. With state-of-the-art instrumentation aboard the satellite, researchers around the world seek to understand how and why these clouds form in the mesosphere, the coldest place in the atmosphere 50 miles above Earth's surface at the edge of space. Scientists also want to determine what is causing the clouds to appear brighter, more frequently, and at increasingly lower latitudes in recent years.

The educators' launch conference provided a general introduction to NASA's two-year AIM mission through five science and technology-related afternoon workshops led by Carlos Cayetano and Annie Richardson, education outreach specialists from NASA Jet Propulsion Laboratory; Tim Strickland, instructor at the Endeavour Center at Vandenberg AFB; and Drs. Paul Adams and Robert Coutts, professors from Fort Hays State University in Kansas and California State University, Northridge, respectively. Workshop presenters offered instructional resource materials on such topics as rocketry, ocean surface topography, electromagnetism, clouds, and cosmic ray attenuation that participants could readily tailor and implement in classrooms, elementary through college.

The conference also featured evening keynote presentations at the Endeavour Center by such

distinguished guests as Dr. James Russell, AIM principal investigator and co-director of the Center for Atmospheric Sciences at Hampton University (VA); Mr. Ray Lugo, NASA KSC Launch Services director; and Mr. Robert Richards, VP of Orbital Launch Systems at Orbital Sciences Corporation, who enhanced understanding of the AIM mission, Pegasus XL rocket and launch processes and heightened anticipation and appreciation of the next day's flawless countdown, rocket drop, and launch under perfectly blue, California skies.

Allan Hancock College looks forward to hosting another educators' launch conference with the Endeavour Center in June 2008, coinciding with the United Launch Alliance Delta 2 launch of NASA's Ocean Surface Topography Mission (OSTM)/Jason-2 satellite at Vandenberg AFB.



Workshop presenter Annie Richardson actively engaged educators in NASA's Voyage on the High Seas board game.

SpaceTEC® Begins Pilot Certification Program with NAS Pensacola

SpaceTEC® began a pilot certification program on August 27 with sailors at the Naval Air Station in Pensacola, Florida. The purpose of this program is to offer the SpaceTEC® Core Certification through Navy COOL (Credentialing Opportunities On-Line). Navy COOL is a developing product for sailors (active and reserves). It defines civilian credentials that best map to a sailor's rating and training, and outlines the path, work, and experience required to achieve them.

This effort has been facilitated by Maria Peterson and Larry Harvey of the Center for Applied Space Technology (CAST). Maria's and Larry's extensive background in Naval affairs has been very helpful in moving the process along.

The first step was to conduct a pre-pilot with selected members of the Center for Naval Aviation Technical Training (CNATT). These individuals participated in the certification process and then became trained SpaceTEC® Examiners (STE's). The initial results were very favorable.

The next step will be to select 30 sailors with different ratings and jobs. These 30 will be tested and the data analyzed to determine how relevant the SpaceTEC® Core Certification is to their rating and training.

If the pilot program is successful, qualified sailors will be able to add the SpaceTEC® Core Certification to their resume. This will help in their professional growth and possible future civilian job opportunities.



SpaceTEC® Core Certification – “Awards Ceremony”.
Pictured left to right: Captain Terry Merritt (Commanding Officer, CNATT), Royce McKie (Navy COOL), AMCS(AW) Daniel Carmody (Career Manager-CNATT), AVCM(AW) George Mullen Jr. (Career Manager-CNATT), ASCM(AW) Michael King (Career Manager-CNATT) and Robert Ward (SpaceTEC® Program Manager).



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