

12-1-06

Bayside High School

BETA

Bayside, Engineering, and Technology
Academy

Executive Summary

Superintendent of Schools
Area 1 Superintendent
Principal

Dr. Richard DiPatri
Dr. Thomas McIntyre
John W. Tuttle

BETA Steering Committee

Dr. Thomas McIntyre, Assistant Superintendent, Area 1, Brevard Public Schools

Cindy S. Kane, Co-Chair; Director, Corporate Relations; Harris Corporation

John W. Tuttle, Co-Chair; Principal, Bayside High School

John Casco, Vice President; Northrop Grumman Integrated Systems

Wendy Martin; Society of Women Engineers

Alan Rakes; Senior Engineer, DRS Technologies

Deborah Ballard; Melbourne – Palm Bay Chamber of Commerce

Lt. Co. Edwin Bayba; Deputy Commander, 45th Mission Support Group, USAF

Daniel Berlinrut; Engineer, 45th Space Wing, USAF

Liz Stoen; Associate Engineer, Mission Services Division, SRS Technologies

Dr. Mary Helen McCay; National Center for Hydrogen Research, Florida Institute of Technology

Lynn Demetriades; Brevard Community College

Bruce Heshner; Assistant Professor, Brevard Community College

Bruce M. Furino; Director, Educational Partnerships, University of Central Florida

Dr. Walter Christy; Director of Secondary Programs, Brevard Public Schools

Margaret Lewis; Director, Office of Applied Technology, Brevard Public Schools

Vicki Mace; Director, Office of School Choice, Brevard Public Schools

Chris Hinkle; Assistant Principal, Southwest Middle School

Joan Taddie; Lead Teacher, Bayside High School

Bayside Engineering and Technology Academy

The Brevard County Superintendent's Office has recognized that no educational program should adopt a "one size fits all" philosophy. Instead it should strive to provide additional academic choices and development for all our students. Therefore, the Brevard County School System is offering the Career Academy. Specifically, it is an educational program that organizes curriculum and instruction in academic subjects around an industry or occupational theme - for example: law, automotive, architectural design, electrical technology, business technology, etc. The focus is to enable students to fulfill college entrance requirements in addition to acquiring work-related knowledge and skills.

The Career Academies are designed to appeal to a wide range of student interests and to offer a myriad of courses created on a continuum of academic difficulty. Students who have a talent for and/or deep interest in the focused curriculum of a particular academy are those who should apply. Academy teachers work together as a team to coordinate teaching in different subjects, stay in touch with parents, and involve employers. These employers support academies in various ways including adult mentors and internships for students.

Bayside is one of many high schools developing academy-type instruction. The theme of Bayside High School's newest academy is Engineering and Technology, an exciting expansion of curricular options. It will provide students with a meaningful and rigorous course of study that will relate well with careers in the fields of mathematics, engineering, space, and technology. It will have strong ties to local industry, colleges and universities. Engineering was chosen to proactively address the gap of future engineering talent locally and worldwide. Women and minority students are of special concern to the success of the program.

Currently the Bayside Engineering Academy Steering Committee is developing the program in the Area I Superintendent's Office. The committee is comprised of local industry talent, educational and the Brevard Public Schools district and school level personnel. The Space Coast Chapter of the Society of Woman Engineers is also represented. Bayside will be accepting student applications in January 2007, for the 2007-2008 school year. Enrollment is based on student and parent choice. It is an exciting endeavor to offer expanded choices to students that not only challenge them academically but also fulfills industry needs for technical talent in the 21st century.

BETA Mission

- The Bayside Engineering and Technology Academy (BETA) will provide an opportunity for students to pursue their dreams and goals of working in the exciting and important field of Engineering. Academic and technical course work will prepare students at all levels for the 21st Century workplace and post-secondary degree opportunities. BETA is a Choice Program that will be academically challenging, technologically sound and college and career driven.

BETA Vision

- To provide a meaningful and rigorous curriculum to assist students interested in careers in the fields of mathematics, engineering, space, and technology
- To develop relevant programs of study and employment opportunities for students in cooperation with colleges and industry
- To expect that 100% of BETA students will graduate with college credits, engineering work experience, professional network portfolio, and industry certification and/or college scholarships.

BETA Goals

- Provide a relevant and rigorous curriculum
- Increase the number of accelerated courses in a student's four year schedule
- To develop the communication skills essential for success in the team concept of today's workplace
- Design academic and technical course work that will prepare students at all levels for the 21st Century workplace and post-secondary degree opportunities
- Provide training to ensure that teachers successfully design and implement curriculum that supports the completion of comprehensive individualized programs of study for students
- Provide a secondary educational experience to ensure that students realize their proficiency in Science and Mathematics will determine their competitiveness in the global market of the 21st Century
- To develop articulation with Middle Schools and Elementary schools to promote interest in engineering
- To develop and maintain partnerships with governmental agencies, industry, colleges, and universities.

BETA Program Highlights

- Ninth Grade Block schedules that enable students to earn two credits each in mathematics and science
- Honors and academic programs with teamed teachers
- Early Advanced Placement and Dual Enrollment opportunities
- College credits
- Students Internships and work experience
- Small Learning Community
- Rigorous college prep focus

- Emphasis on Systems Engineering
- Career exploration opportunities
- Industry sponsored senior projects
- Business, government, and higher education partnerships
- Professional mentors and career shadowing
- Academy Director and counselor for the Academy student population

Opportunities for BETA Graduates

- Bright Future Scholarship
- Gold Seal Scholarship
- Technical and Career Certification
- Eligible for specifically designated engineering scholarships and programs
- Business Partner Mentors
- Engineering work experience resume
- Developed engineering or technical Network

BETA Candidates

- Functioning at or above grade level on FCAT Reading, Math, and Science
- Interested in Engineering, Mathematics, Research, Aeronautics, or a Space Industry career.
- Interested in a Engineering Technology course of study
- Goal-oriented
- Parental involvement and support

BETA Program Completion Requirements

In order to provide students at different academic levels and employment interests, the requirements will be interchangeable. This will also allow students the flexibility to change direction if they develop interests in other areas.

- **Engineering**
 1. Five Mathematics and Science credits / Four Language Arts and Social Studies credits
 2. Complete an advanced program of study that includes a minimum of three credits in any combination of approved Dual Enrollment, Advanced Placement, or approved Honors courses
 3. Complete sequence of four BETA engineering courses
 4. Complete a work-related Internship (Senior Project) by the end of the senior year
 5. Maintain a 3.0 unweighted GPA
 6. Parent volunteer service agreement

Recommended Engineering Progression

9th Block (8 Credits)	10th Grade (7 Credits)	11th Grade (7 Credits)	12th Grade (7 Credits)
English 1 BETA Honors	English 2 BETA Honors	AP English Language	AP English Literature
World History BETA Honors	American History BETA Honors	AP History	American Government / Economics
Geometry BETA Honors	Pre-Calculus/Calculus	Calculus / AP Calculus	AP Calculus / Dual Enrollment
Algebra 2 BETA Honors/ Pre-Calculus	AP Chemistry	AP Biology	AP Physics
Biology BETA Honors	Phys. Ed. / Personal Fitness	Physics Honors (Mini - Intro to Engineering / Engineering Concepts)	Dual Enrollment Intro to Engineering / Engineering Concepts and Methods
Chemistry BETA Honors	Foreign Language / Elective	Foreign Language / Elective	Dual Enrollment
Career Research and Decision Making / Life Management	Engineering Technology I (Systems Engineering)	Engineering Technology II (Robotcis)	Engineering Technology III (Senior Project)
Fine Arts Elective			

- **Technical**

1. Four MESH (Mathematics, English, Science, History) credits
2. Complete a Career and Technical Education Program of Study (3 or more credits to complete a sequential program of study resulting in a credential endorsed by a national, state, or local industry)
3. Complete sequence of four BETA engineering courses
4. Complete a work-related Internship (Senior Project) by the end of the senior year
5. Maintain a 2.5 unweighted GPA in MESH courses and 3.0 weighted GPA in Career and Technical courses
6. Parent volunteer service agreement

Recommended Technical Progression

9th Grade (7 Credits)	10th Grade (7 Credits)	11th Grade (7 Credits)	12th Grade (7 Credits)
English 1 / English 1 Honors	English 2 / English 2 Honors	English 3 / English 3 Honors	English 4 / English 4 Honors
World History / World History Honors	American History / Amer. History Honors	American Government / Economics	History Focus Choice / Dual Enrollment
Algebra 1	Informal Geometry / Geometry	Liberal Arts / Algebra 2	Math Focus Choice / Dual Enrollment
Biology / Biology Honors	Chemistry / Chemistry Honors	Physics / Physics Honors Mini-Intro to Engineering / Engineering Concepts	Science Focus Choice / Dual Enrollment
Career Research and Decision Making / Life Management	Engineering Technology I (Systems Engineering)	Engineering Technology II (Robotcis)	Engineering Technology III (Senior Project)
Elective	Career & Tech Choice Level I	Career & Tech Choice Level II	Career & Tech Choice Level III
Fine Arts Elective	Phys. Ed. / Personal Fitness	Elective	Dual Enrollment

Waiver Appeals

1. Waiver appeals will be handled on an individual basis.
2. The appeal must be in writing and addressed to the school principal.
3. The appeal will be forwarded and reviewed by a three-person committee comprised of the district Director of School Choice, the Area Superintendent, and the district representative appointed by the Office of School Choice.

BETA Choice

Enrollment in the Bayside Engineering and Technology Academy is based on student and parent choice. BETA attendance zone includes all of the areas south of the Pineda causeway as part of its feeder chain. Students from any of these areas may apply to attend BETA if they meet the academic requirements. As a program of Choice, it is expected that the parents and students will support the BETA beliefs, objectives, policies and procedures.

Admission

1. Students applying for the BETA "Engineering Progression" must have a cumulative 3.0 GPA or higher at the end of the first semester of 8th grade, with a minimum of B or higher in math and science. Students must be at Level III or higher on FCAT math and reading.
2. Students applying for the BETA "Technical Progression" must have a cumulative 2.0 GPA or higher at the end of the first semester of 8th grade. Students must be at Level II or higher on FCAT math and reading.
3. If a student does not qualify at the end of first semester of 8th grade they may apply after second semester, and if they qualify they may be admitted based on seat availability.

Application / Lottery

1. Admission begins with completion of the official application form.
2. Applications for the 2007-08 school year will be available December 13, 2006, and will be accepted until February 2, 2007.
3. Applications are to be submitted to Bayside High School by mail, or in person to Joan Taddie.
4. Upon submission, all applications will be screened for completeness and verification of requirements.
5. Inaccurate or incomplete information on the application may result in the student application being withdrawn from consideration.
6. All valid applications will be treated equally and will be assigned a number in the order that they are received at Bayside High School. Applications are due no later than February 2, 2007.
7. Projected enrollment for the 2007-08 Bayside Engineering and Technology Academy is 50 students for the engineering progression and 50 students for the technical progression.
8. If, on February 2, 2007, there are more students applying for either level of the academy than space available, there will be a public lottery at Bayside High School conducted by a committee of School Advisory Council members on February 15, 2007, to ensure fairness in the selection of the students for the 2007-08 academy class.
9. Parents of the applicants will be notified by mail of the lottery's time and place.
10. Parents do not have to attend the lottery in person.
11. Parents will be notified in writing once the students have been selected and approved for admission.

12. A waiting list will be maintained for each level if applications exceed available space.
13. Position on the waiting list will be determined by the February 15, 2007, lottery.
14. Parents will be notified in writing of their student's position on the waiting list.
15. Students submitting valid applications after February 2, 2007, will be assigned a space in the academy if there is space available, based on the order of the late applications received at Bayside High School.
16. If there is no space available, late applications will be assigned a position on the waiting list following the last number drawn in the lottery.
17. Parents of late applicants will be notified in writing of their student's position on the waiting list.

Lottery Appeals

1. Appeals of hardship will be handled on an individual basis.
2. The hardship must be in writing and addressed to the school principal.
3. The appeal will be forwarded and reviewed by a three-person committee comprised of the district Director of School Choice, the Area Superintendent, and the district representative appointed by the Office of School Choice.

BETA Facilities, Equipment, Personnel

Physics and Engineering Tech combined labs should be included in the plans for the classroom building addition for 2008-09. Equipment, computers, teacher training and resources need to be identified to support BETA curriculum. The estimated cost of these upgrades is approximately \$200,000.

BETA Partnerships

- Harris Corporation
- Northrop Grumman
- DRS Optronics
- US Air Force 45th Space Wing
- Melbourne – Palm Bay Area Chamber of Commerce
- Society for Women Engineers
- Florida Institute of Technology
- University of Central Florida
- Brevard Community College
- NASA
- Solar Energy Center

Harris Corporation

- Internships during school year (must be 16 years old and U.S. citizen)
- Guaranteed confirmed registration spots during their Engineering Orientation for students in February – Team Voltage
There are limited slots available and they fill almost immediately.
- Speakers and Road Shows
- Scholarships from “Step Up” and “SPACE” for minorities and females to go to Summer B sessions at UCF and UF to prepare for the regular fall session of classes
- 2 Scholarships for 2 females at UF for 1 week of Computer Science study.
- Summer internships (must be 16 years old and U.S. citizen)
- Executive Champions Program
Harris executives who have graduated from the top 25 engineering schools in the country will mentor individual students who want to get into the schools from which the executives graduated. The executives will do what they can to help the student with the school application and the admission process.
- Equipment donated to be used for BETA classes and projects.

Northrop Grumman

- Internships (must be 16 years old and U.S. citizens)
- Guaranteed slots for their Engineer’s Week for high school students
- Equipment will be donated to be used for BETA classes and projects
- Woman in Northrop Grumman will invite BETA girls to be part of their workshops and meetings (i.e. Toastmasters, Teamwork workshops)
- Speakers
- Parents and Teachers will be invited to orientation seminars at Grumman

DRS Optronics Division

- Tours for students and family members of the Academy program
- Summer Internships (16 year minimum age and must be US citizen)
- Job shadowing
- One-on-one mentorships between DRS engineers and specific students in the program
- Donation of used equipment
- Sponsor Engineering competitions
- Provide Advisory Board to Bayside Engineering Academy
 - Resource to teacher to help in planning
 - Potential to provide guest lectures in specific related topics
- Open up some of DRS Institute courses to Bayside Academy teachers

United States Air Force 45th Space Wing

- To be decided at a later date

Melbourne – Palm Bay Area Chamber of Commerce

- Workshops on Teamwork, Workplace Etiquette, etc.
- Speakers
- Will coordinate events utilizing numerous businesses

Society of Women Engineering

- Speakers
- Mentors

Florida Institute of Technology

- Presidential scholarships (five per year)
- Dual credit courses (where appropriate)
- Laboratory demonstrations and projects
- Speakers on engineering disciplines
- Shadow program (with faculty, staff, and students)
- Observation of FIT Student Design Projects
- Joint proposals (curriculum development, etc.)

University of Central Florida

- 30 possible slots out of the 200 available held for graduates of BETA to enroll in the EXCEL program (5000 students applied for the 200 slots last year!)
The mission of the EXCEL program is to increase student success in the first two years of their college career in a STEM (Science, Technology, Engineering, and Math) discipline. This is accomplished via the feeling of a small college experience; on-campus housing to incoming freshmen; priority scheduling for the common EXCEL courses; and EXCEL Tutoring Center and an EXCEL Academic Advisor; a paid undergraduate research experience and the creation of a UCF-EXCEL learning community.
- UCF-CECS 2+1+1 Program priority consideration
Students interested in a degree in engineering may attend BCC Cocoa for two years to attain the Pre-Engineering AA Degree. Once the student completes the Pre-Engineering Degree and transfers to UCF, he or she will take the junior year of coursework for the Bachelor of Science in Aerospace or Mechanical Engineering Degree at UCF Cocoa. Students will attend UCF Orlando during their senior year to complete the fourth year, lab-intensive, degree requirements.
- Outreach Programs
 - Minority Engineering and Computer Science Programs
 - Women in Engineering and Computer Science
 - Florida Foundation for Future Scientists
- John Tuttle and Joan Taddie were asked to be on the panel during the 2007 Florida Engineering Education Conference
- Engineering forums for High School and Middle School teachers, administrators, and students
- Infinity Project

Curriculum and teacher training with stipends – i.e. High School teachers trained to teach Introduction to Engineering and Engineering Concepts and Methods (students would receive 1 college credit)

Brevard Community College

- Dual Enrollment Courses
- Possible program to align the BETA program to the Electronics Engineering Technology program at BCC to shorten the time it requires for BETA students to get their Associate of Applied Science in Electronic Engineering Technology degree from BCC

NASA

- To be decided at a later date

Solar Center

- Tours of center
- Hands-on solar energy kits available for teacher check-out
- Speaker series
- Solar energy themes with Brevard Museum of History and Planetarium

BETA Assessment Criteria

The Bayside Engineering and Technical Academy will meet standards of assessment criteria based on NCAC standards.

National Career Academy Coalition Self-Assessment Rubric for Career Academies

1. **Defined Mission & Goals:** The career academy has a written definition of its mission and goals. These are available to the administrators, teachers, students, parents, advisory board, and others involved in the academy.
 - a. To focus on college and career
 - b. To raise student aspirations and commitment
 - c. To increase student achievement
2. **Academy Structure:** An academy needs to have a well-defined structure within the high school, reflecting its status as a small learning community.
 - a. Cross-grade articulation
 - b. Student selection
 - c. Cohort scheduling
 - d. Physical space
 - e. Small size, supportive atmosphere

3. **Host District and High School:** Career academies exist in a district and high school context. These contexts are important determinants of an academy's success.
 - a. Support from the Board of Education and Superintendent
 - b. Support from the principal and high school administration
 - c. Adequate funding, facilities, equipment, and materials
4. **Faculty & Staff:** Appropriate teacher selection, leadership, credentialing and cooperation are critical to an academy's success.
 - a. Teacher Leader(s) / Coordinator(s)
 - b. Teachers are credentialed in their field, volunteer in the academy, and are committed to its mission and goals
 - c. Counselors, non-academy teachers, and certificated staff are supportive
5. **Professional Development:** Since an academy places teachers and other adults into roles not normally included in their previous training, providing adequate professional development time, leadership, and support is critical.
 - a. Common planning time
 - b. Teacher professional development
 - c. Employer & parent orientation
6. **Governance & Leadership:** The academy has a governing structure that incorporates the views of all stakeholders.
 - a. Advisory board with broad representation
 - b. Regular meetings
 - c. A healthy partnership
 - d. A student voice
7. **Curriculum & Instruction:** The curriculum and instruction within an academy meet external standards and college entrance requirements while differing from a regular high school by focusing learning around a theme.
 - a. Meets external standards
 - b. Meets college entrance requirements
 - c. Curriculum is sequenced, integrated, rigorous, and relevant
 - d. Post-graduate planning
 - e. Dual credit options
8. **Employer, Higher Education, & Community Involvement:** A career academy links high school to its host community and involves members of the employer, higher education and civic community in certain aspects of its operation.
 - a. Career theme fits the local economy
 - b. Community involvement
 - c. Incorporates citizenship
 - d. Work-/community-based learning

9. **Student Assessment:** Improvements in student performance are central to an academy's mission. It is important to gather data that reflect whether students are showing improvement and to report these accurately and fairly to maintain the academy's integrity.
 - a. Student data are collected
 - b. Multiple academic measures are included
 - c. Technical learning is assessed
 - d. Accurate reporting
 - e. Evidence of impact

10. **Cycle of Improvement:** No new academy functions perfectly. Even well established and operated academies benefit from self-examination and refinement. Ensuring and improving the quality of a career academy requires engaging in a regular cycle of improvement.
 - a. Academy implementation is examined
 - b. Academy refinements are planned
 - c. Changes reflect the academy's mission and goals

Summary

Through this unique Engineering Academy Program, students will:

- Increase the number of accelerated courses in a their four-year schedule to prepare them for the rigor of the nation's most prestigious Engineering schools
- Have the opportunity to graduate with a sequential program of study in Engineering Technology, resulting in an industry credential endorsed by a national, state, or local industry
- Develop communication skills necessary for success in the "team concept" of today's workplace
- Participate in internships and mentoring programs at local engineering corporations during the school year and summers, to enhance the relevance of their Engineering-based coursework and to establish important career networking
- Be eligible for scholarships and special Engineering programs offered by numerous colleges and universities
- Be prepared to compete in the global market of the 21st Century