

Florida Institute of Technology's application submitted in  
accordance with Code of Maryland Regulations  
13B.02.01.08I 'Further requests by institution' that has  
received extended approval



# *Florida Institute of Technology*

*High Tech with a Human Touch™*

October 25, 2017

Jacqueline M. Cade  
Education Policy Analyst & ACM State Coordinator  
Maryland Higher Education Commission  
6 N. Liberty Street, 10th Floor  
Baltimore, MD 21201

Re: Add-on Proposals for Southern Maryland Higher Education Center

Florida Institute of Technology (FIT) received extended operational approvals for several graduate programs and areas of concentration at the Patuxent River and Southern Maryland Higher Education Center (SMHEC) sites. FIT is pleased to submit herein add-on proposals for the following approved programs to be offered at SMHEC pursuant to COMAR 13B.02.01.06.

1. Master of Science in Flight Test Engineering
2. Post-Baccalaureate (Graduate) Certificate in Flight Test Engineering
3. Master of Science in Engineering Management
4. Master of Business Administration

These programs are all approved at the Patuxent River, MD site. Due to an unplanned discontinuation of classroom space at a teaching location on base at NAS Patuxent River, FIT sought alternative classroom space to continue operations. SMHEC, located 7 miles north provided the classrooms for a semester use fee. Starting in Fall 2016 and continuing, FIT has offered individual courses at SMHEC of programs approved at Patuxent River. The program proposals enclosed herein are part of the total approved Patuxent River programs that require approved for offer at SMHEC. FIT is working expeditiously toward timely program approvals at SMHEC.

Please let us know if you have any questions.

Sincerely,

Dr. Robert R. Schaller, Sr.

Director, Patuxent River and SMHEC Sites

cc: Dr. Mary Bonhomme, Associate Provost, Department of Extended Studies

## Attachments

- New Location Proposals, Master of Science and Post-Baccalaureate (Graduate) Certificate in Flight Test Engineering, Master of Science in Engineering Management, and Master of Business Administration
- SMHEC Program Approvals Letter for same
- MHEC Renewal Authorization Letters, Patuxent River 2015-2020, SMHEC 2015-2020
- MHEC Extended Operational Approvals for the Master of Science and Post-Baccalaureate (Graduate) Certificate in Flight Test Engineering at Patuxent River

## Educational Need

## A-1: Current Programs in MD – New Location/Southern Maryland Higher Education Center

(a) List of new programs

Program Title	Degree	Mode of Instruction	Total Credit Hours	Offered on Main Campus Yes/No
Flight Test Engineering	M.S.	Classroom/Lab	30	Yes
Flight Test Engineering	Post-Baccalaureate Certificate	Classroom/Lab	12	Yes
Engineering Management	M.S.	Classroom	30	Yes
Business Administration	M.B.A.	Classroom	36	Yes

These program are presented following the guidance provided in COMAR 13B.02.01.06.

(b) See University Catalog for program information, see [http://catalog.fit.edu/preview\\_program.php?catoid=1&poid=166](http://catalog.fit.edu/preview_program.php?catoid=1&poid=166)

(c) Brief description of student population to be served by the proposed new programs

Florida Institute of Technology is committed to supporting a diverse community of learners, which includes offering career-relevant programs that advance students in their professions and in their communities. The Department of Extended Studies of the Nathan M. Bisk College of Business is particularly interested in serving the needs of the professional adult learner, and often those connected with a military activity. This student population can include active duty military, reservists, veterans, civil servants, and government service contractors along with people from the broader community. The proposed new programs are in response to a growing local demand to increase the knowledge, skills and abilities of personnel in the fields of Flight Test Engineering, Engineering Management, and Business Administration. Program descriptions in the University Catalog provide explanations of the student population to be served by the program along with the opportunities for academic and professional achievement. See also A-1a immediately following for program descriptions, and A-2: Educational Need for each proposed new program.

## **A-1a: Program Descriptions**

### **Master of Science in Flight Test Engineering**

The Master of Science in Flight Test Engineering seeks to expand student knowledge, skills, ability and competency in the field of aircraft flight testing. Flight test engineering views the aircraft design problem from the perspective of evaluating the performance of an existing aircraft, rather than from the perspective of designing an airplane to meet performance specifications. The core courses teach the engineer how to test an aircraft safely, measure aircraft performance and determine its flying qualities. The program teaches students the necessary measurement techniques, instrumentation, and the data analysis methods required to collect and reduce flight test data to standard atmospheric conditions, expand the results for publication in pilot operating handbooks, and for use in improving the design of future aircraft. Additionally, the program teaches students how to test and evaluate the aircraft's various mechanical and electrical subsystems including propulsion, structure and avionics. Career paths for individuals who earn a master in flight test engineering vary based on their chosen industry, but their demand will be high due to the lack of specialized training and the increasing need as globalization and unmanned air vehicles continue to grow.

### **Post-Baccalaureate Certificate in Flight Test Engineering**

The Flight Test Engineering Graduate Certificate seeks to expand student knowledge, skills, ability and competency in the field of aircraft flight testing. Flight test engineering views the aircraft design problem from the perspective of evaluating the performance of an existing aircraft, rather than from the perspective of designing an airplane to meet performance specifications. The core courses that comprise the Certificate teach the engineer how to test an aircraft safely, measure aircraft performance and determine its flying qualities. The program teaches students the necessary measurement techniques, instrumentation, and the data analysis methods required to collect and reduce flight test data to standard atmospheric conditions, expand the results for publication in pilot operating handbooks, and for use in improving the design of future aircraft.

### **Master of Science in Engineering Management**

The Master of Science in Engineering Management degree program is designed for professionals in engineering and related technical fields seeking to enhance their technical expertise and lead dynamic work teams. This degree gives individuals a unique blend of engineering and management expertise, preparing them with the leadership skills they need to oversee complex technical projects. The core competencies of the master's in engineering management include quality and project engineering encompassing need and requirement identification, design and implementation planning and budgets, measurement of objectives and product/process engineering to improve system performance in addition to engineering operations and logistics and team dynamics and productivity. Since many graduates are already working professionals, these individuals often find new engineering management jobs through career advancement opportunities within their current organization or by running/creating their own companies.

**Master of Business Administration (MBA)**

The Master of Business Administration (MBA) degree program is designed for professionals from diverse backgrounds seeking advanced leadership positions in the private, public, and military sectors. MBA students gain comprehensive knowledge in accounting, economics, finance, marketing and organizational behavior from a managerial perspective. Students expand their depth of knowledge on the inter-relatedness of business functions with executive decision-making and corporate leadership. The objective of the masters in business administration is to equip students with the knowledge, critical thinking and leadership skills necessary to solve complex business situations applicable to any industry. Students who graduate with a master's degree in business administration from Florida Tech are likely to find careers in executive leadership roles in management, business, finance, economics or marketing. Armed with a foundation centered on innovation, diversity, ethics and leadership, graduates are prepared for executive-level decision-making and corporate leadership.

## **A-2: Educational Need**

### **M.S. Flight Test Engineering Post-Baccalaureate Certificate in Flight Test Engineering**

- (a) What critical and compelling Regional or Statewide (Maryland) need and demand does your proposed program meet?

FIT is proposing the addition of an M.S. and Post-Baccalaureate Certificate in Flight Test Engineering at the SMHEC site. NAS Patuxent River is one of four “Major Range and Test Facilities Bases (MRTFB)” dedicated to flight test in the United States and employs more than 20,000 military, civilian, and contractor personnel. There are two military schools that offer education and training in Flight Test Engineering and one civilian school. Together, the Air Force and Navy Test Pilot Schools graduate about 100 students per year. National Test Pilot School (the one civilian school similar to the two military schools) graduates about 40 students per year, many of which are foreign and return to their native countries after graduation. The number of graduates for the three major schools is limited due to the high cost of the training (about \$1M per graduate). Having no more than 140 flight test graduates per year to support the 80,000 employees of all four MRTFBs is inadequate. The FIT program offers a lower-cost alternative to educate and train more people in Flight Test Engineering. FIT expects at least 15 NAS Patuxent River personnel to enroll in the FIT programs per year.

At this time, only the Air Force and National Test Pilot Schools award M.S. degrees in Flight Test Engineering. Despite having nearly identical curricula with the Air Force Test Pilot School, the Navy Test Pilot School at NAS Patuxent River does not award the M.S. degree or Graduate Certificate. FIT has agreed with the Navy to articulate 12 of the 30 required semester hours toward the M.S. degree for Navy Test Pilot School graduates. FIT expects as many as 10 Navy Test Pilot School graduates to enroll in the FIT program per year, since they can finish the program easily within the remainder of their two-year follow-on tour at NAS Patuxent River, MD.

Department of Defense (DoD) Acquisition Programs in the Washington DC Region could benefit from employees with education and training in Flight Test Engineering. Teams on Major Acquisition Programs are responsible for the planning, budgeting, and execution of development and operational test programs. Knowing the requirements of flight test helps ensure test programs are properly scoped in terms of technical requirements, schedule, and budget. The Navy alone employs over 70,000 personnel in the Washington DC Region. FIT expects at least 10 Washington DC Region personnel to enroll in the FIT programs per year.

FIT currently has the capacity to comfortably handle 20 Maryland-campus students per year and could readily expand to the forecasted 35 students per year by adding condensed courses during summer semesters.



According to the United States DoD Fiscal Year 2015 Budget Request published by the Office of the Under Secretary of Defense (Comptroller) / Chief Financial Officer in March 2014, defense budgets are expected to remain above \$500 billion for the next 5 years (see Figure 1-3 from the report shown below). Thus, the market for Flight Test Engineering professionals should continue to remain strong in the Patuxent River area.

**Figure 1-3. DoD Proposed Outyear Topline for the Base Budget**

<b>Current \$ in billions</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY15 – FY19 TOTAL</b>
FY 2014 PB	540.8	551.4	560.0	568.6	577.1	2,797.9
FY 2015 PB	495.6	535.1	543.7	551.4	559.0	2,684.9
Delta	-45.2	-16.2	-16.2	-17.2	-18.1	-113.0
<b>Real Growth</b>		<b>+6.3%</b>	<b>-0.1%</b>	<b>-0.5%</b>	<b>-0.6%</b>	<b>+1.3%*</b>

*Numbers may not add due to rounding*

*\*Average annual real growth of the FY 2015 President's Budget for FY 2015 – FY 2019.*

Maryland is expecting strong employment in aviation-related industry through 2022 as shown in the table below. While most of these jobs may not require M.S. degrees in Flight Test Engineering, the increasing amount of specialized knowledge required for technical evaluation of complex engineering systems makes the Flight Test Engineer a valuable asset.

Industry Sector	2012	2022	Change	% Chg
Federal Government, Excluding Post Office	133,907	132,056	-1,851	-1.38
Professional, Scientific, and Technical Services	242,093	284,648	42,555	17.58
Air Transportation	4,459	4,771	312	7.00

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2012 – 2022, Maryland Industry Projections  
<http://www.dlrl.state.md.us/lmi/iandoproj/industry.shtml> (updated March 16, 2015)

### (1) Occupational Need

Flight Test Professionals are highly valued at any MRTFB. The desired learning outcomes for a Flight Test Engineer are:

- Demonstrate mastery of fundamental aircraft performance, stability & control, and avionics theory.
- Efficiently plan and conduct airborne flight test.
- Satisfactorily reduce and standardize raw flight test data.
- Critically analyze flight test data, draw logical conclusions, and form sensible recommendations.
- Cogently report results in written, oral, and graphical flight test formats.
- Work effectively within a flight test team, in the air and on the ground.

Formal academics consist of lessons in three airplane disciplines. Airplane performance topics

include weight & balance, airspeed calibration, stall speed, reciprocating engine power, propeller theory, level-flight (cruise); climb, energy, takeoff and landing. Stability & control topics include longitudinal static stability, maneuvering flight stability, lateral-directional static stability, dynamic stability, and high angle-of-attack flight (stalls and spins). Avionics topics include communication equipment, navigation, surveillance, weather radar, human factors considerations, landing systems, and flight management systems. Each academic lesson is reinforced with flight laboratories. In total, students receive at least 12 flights, 2 tours, and 3 simulator demonstrations.

On-the-job education and training is limited at MRTFB's by the fact that not everyone is authorized or qualified to fly in military aircraft. FIT's program is open to anyone (including foreign students). No physical exam is required. No previous flight experience is necessary. Students fly with an instructor test pilot and gather in-flight data. All flight gear (e.g. headsets) are provided. Students need only a pencil, paper, and a watch.

The knowledge, skills, and abilities acquired in Flight Test Engineering apply to any other test position or systems engineering occupation. Flight Test Engineers deal with an entire system as a whole. They learn a process of theory, plan, fly (test), reduce, deduce, and report. They practice sound technical and safety planning. Given any system, the Flight Test Engineer can build answers to the following test questions:

- WHY** is the test being conducted?
- WHO** will conduct the test?
- WHO** are the customers?
- WHAT** will be tested?
- WHAT** are the objectives of the test?
- WHAT** are the measures of performance (MOP) for each objective?
- WHAT** are the evaluation criteria for each MOP?
- WHAT** are the success criteria for each MOP?
- WHAT** final data products will be produced to answer each MOP?
- WHAT** tests will be conducted?
- WHERE** will the tests be conducted?
- WHEN** will the tests be conducted?
- HOW** will the tests be conducted?
- WHAT** data need to be acquired, reduced, and analyzed?
- HOW** will the data be acquired, reduced, and analyzed?
- WHAT** are the expected results of the tests?
- WHAT** test reporting will be accomplished?
- WHAT** logistics support is required for the test?

(2) Societal Need – N/A

(b) If similar programs exist in the State, what are the similarities or differences in your program in terms of the degrees awarded, the areas of specialization, and the specific academic content of the programs?

There is no similar Flight Test Engineering graduate degree program available in Southern Maryland or throughout the state of Maryland.

(c) Is a Maryland employer sponsoring/supporting the application for the program to be offered at this location? **No**

## **A-2: Educational Need**

### **M.S. Engineering Management**

(c) What critical and compelling Regional or Statewide (Maryland) need and demand does your proposed program meet?

#### **(3) Occupational Need**

FIT is proposing the addition of an M.S. in Engineering Management at the SMHEC site. The program is designed for professionals in engineering and related technical fields seeking to enhance their technical expertise and lead dynamic work teams. This degree gives individuals a unique blend of engineering and management expertise, preparing them with the leadership skills they need to oversee complex technical projects. The core competencies of the master's in engineering management include quality and project engineering encompassing need and requirement identification, design and implementation planning and budgets, measurement of objectives and product/process engineering to improve system performance in addition to engineering operations and logistics and team dynamics and productivity.

The objective of the master's in engineering management degree program is to create individuals who are well prepared for executive leadership roles in engineering, technology, management or even running their own companies. Since many graduates are already working professionals, these individuals often find new engineering management jobs through career advancement opportunities within their current organization.

Gary Hinkle, president and founder of Auxilim, wrote an article for SPIE.org (International Society for Optics and Photonics) where he pointed out that "the technical skills that an engineer's job requires are really a small percentage of the competencies that are needed to be successful. Interpersonal competencies, business acumen, and, yes, leadership and management skills are all required in engineering work. As engineers advance in the profession, leadership and management competencies become more important". This sentiment was further expanded as a notable future concern by senior engineering and executive managers in a Deloitte and Touche LLC survey of 1,900 engineers from various engineering societies highlighting the need for "...managers well-versed in the disciplines of both technology and business to remain successful in a world where product innovation is increasingly becoming a matter of multidisciplinary, international, and often multicultural collaboration."

The major tenant command at NAS Patuxent River is Naval Air Warfare Center Aircraft Division (NAWCAD) where thousands of technical and engineering employees address the unique challenges of naval aviation. Many seek advanced degrees in specific engineering fields such as aerospace, mechanical, electrical, and computer engineering. Some seek the M.S. in Engineering Management if their career goal is program management of engineering programs. The FIT program is the only face-to-face program of its kind in Southern Maryland.

Maryland is expecting continued growth in technology industries as a major source of future employment. BioMaryland characterizes the MD 270 corridor while CyberMaryland defines the vast swath around Ft. Meade. The emerging field of autonomy and unmanned systems is a key driver for Southern Maryland as Naval Aviation advances quickly into this area with NAVAIR/NAWCAD serving as the anchor. The region is rapidly evolving into AeroMaryland. Science and technology development is at the heart of this boom.

Department of Defense (DoD) Acquisition Programs in the Washington DC Region could benefit from employees with education and training in Engineering Management. Teams on major acquisition programs are responsible for the planning, budgeting, and execution of development and operational engineering programs. Knowing technical requirements helps ensure test programs are properly scoped in terms of technical requirements, schedule, and budget. The Navy alone employs over 70,000 personnel in the Washington DC Region. FIT expects at least 10 Washington DC Region personnel to enroll in the FIT programs per year.

The M.S. in Engineering Management degree is suitable for individuals from fields other than technology and computing, including business, mathematics, science and engineering, education, health care and government administration. Career paths for individuals who earn this degree vary widely based on this developing field bridging the gap between traditional business and engineering technology roles. According to the Bureau of Labor Statistics 2014-15 Occupational Outlook Handbook, management roles are anticipated to remain stable at 11% job growth through 2022 while information systems management is predicted to grow 15% faster than average through that same time period.

The primary source of students for this program is the employee population at NAS Patuxent River including civilians, contractors, and military personnel. Additionally, this program has appeal to working professionals in the broader Southern Maryland community in the computing, energy and environmental sciences fields, education, health care, government administration, and related industries.

Maryland is expecting strong employment in professional, scientific, and technical services industries and in technology management occupations through 2022 as shown in the table below. While most of these jobs may not require the M.S. in Engineering Management degree, the need for specialized knowledge required for management of complex technical systems is increasing much faster than all needs in the management labor force.

Industry/Occupational Sector	2012	2022	Change	% Chg
Professional, Scientific, and Technical Services	242,093	284,648	42,555	17.58%
Computer and Information Systems Managers	10,671	12,245	1,574	14.8%
Management Occupations	185,303	196,575	11,272	6.1%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2012 – 2022, Maryland Industry Projections  
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml> (updated March 16, 2015)

List of possible career paths for students with a M.S. Engineering Management degree:

CTO (Chief Technology Officer)  
Chief Engineer  
Management Information Systems Director  
Information Systems Manager  
Program Manager  
Project Manager  
IT Project Manager  
Senior Engineering Analyst  
Engineering Consultant

(4) Societal Need – N/A

- (d) If similar programs exist in the State, what are the similarities or differences in your program in terms of the degrees awarded, the areas of specialization, and the specific academic content of the programs?

There is no similar face-to-face Engineering Management graduate degree program available in Southern Maryland. Both Johns Hopkins University and George Washington University formerly offered similar Systems Engineering Management programs at SMHEC but converted these to online delivery.

- (d) Is a Maryland employer sponsoring/supporting the application for the program to be offered at this location? **No**

## **A-2: Educational Need**

### **Master of Business Administration (MBA)**

(a) What critical and compelling Regional or Statewide (Maryland) need and demand does your proposed program meet?

(1) Occupational Need

#### Southern Maryland Need Analysis

For the last two decades, the growth of Southern Maryland's population and workforce has been the fastest of any region in Maryland (source: 2010 Census, 2000 Census). This is largely due to Base Realignment and Closure (BRAC) decisions made in the early 1990s that brought thousands of jobs to NAS Patuxent River through consolidation of several Naval Aviation Enterprise facilities from other states including Naval Air Systems Command (NAVAIR), the headquarters from Virginia. The makeup of the workforce at the Naval Air Station has changed immensely as a result. Prior to BRAC NAS Patuxent River had a focused test and evaluation mission that was very technical in nature. The base was established 50 years earlier as the Naval Air Test Center (NATC) and conducted all naval aviation test and evaluation as new aircraft entered the fleet as well as for upgrades and improvements to existing aircraft and related systems. The workforce at NAS Pax in the mid-1980s totaled about 12,000 and consisted of roughly half military and the other half civilian and to much a lesser degree, contractor support personnel. The occupational makeup was largely technical with aviation engineers and technicians representing the major skill sets.

In the early 1990s NAS Patuxent River reorganized as the Naval Air Warfare Center, consolidating research and development which included more front-end science and technology functions requiring a more highly educated workforce. The further consolidation of NAVAIR brought program acquisition to NAS Patuxent River which further required higher levels of education to manage major systems and programs. Today, the workforce at NAS Pax is about 23,000 of which 20,000 or so are civilian (half Navy and half contractor), and the remaining active duty military. Not only has the number of workers greatly increased but the need for proportionally more senior leadership positions in the GS-14, GS-15, Senior Executive Service (SES) civilian jobs along with the military equivalent of flag officers (Admiral) is very evident. The test and evaluation mission, still a central part of NAS Patuxent's work, is but one of the many functions carried on at Pax River.

There are a number of schools offering technical programs at the baccalaureate, master's, and doctorate levels at SMHEC. Programs in business, finance and management have also followed as these skills are now essential to successful conduct of NAVAIR's program management mission. Consistent with this, Florida Institute of Technology began offering the Master of Science in Project Management at SMHEC in 2014.

The MBA is FIT’s largest degree program in Southern Maryland with more than 30 active students each semester. While NAS Patuxent River employees represent most of these enrollments, there is increasing demand for the MBA in commercial, institutional, and non-profit sectors in the region. FIT has awarded approximately 325 MBA (including PMBA) degrees at Patuxent River since 1982. The list includes several local leaders in industry and government service.

### Maryland Workforce Analysis

Continued growth is expected in the workforce in Maryland for the next decade. The table below indicates that all industries in the Maryland workforce will grow by 179,314 or 6.5% by 2022. Five industry sectors are selected where the MBA program can assist leadership to address increasingly challenging economic realities. These five sectors represent one-third of the total industrial workforce, but more than half (58%) of expected new job creation, totaling more than 100,000. Management levels from these sectors, whether from existing ranks or projected new jobs is another potential source of enrollment interest.

Industry Sector	2012	2022	Change	% Chg
Professional, Scientific, and Technical Services	242,093	284,648	42,555	17.6%
Management of Companies and Enterprises	25,970	27,790	1,820	7.0%
Educational Services	251,316	275,034	23,718	9.4%
Healthcare and Social Assistance	351,939	384,934	32,995	9.4%
Arts, Entertainment and Recreation	41,796	45,976	4,180	10.0%
Subtotal 5 Sectors	913,114	1,018,382	105,268	11.5%
Total All Industries	2,740,196	2,919,510	179,314	6.5%
5 Sectors as % of All Industries	33.3%	34.9%	58.7%	

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2012 – 2022, Maryland Industry Projections  
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml> (updated December 3, 2014)

Also note that the Government sector represents one of the largest employers in Maryland with 283,183 workers including federal, state and local governments. While only modest employment growth is expected (0.9%), the concentration of senior staff in the GS-14, GS-15, and Senior Executive Service (SES) wage grades, are another potential source of students.

Finally, the military community in Maryland, and Southern Maryland in particular represents another source of potential MBA enrollments. This population includes active duty, reserves, and veterans.

According to web sources, military active-duty personnel including civilians by state (current as of Aug, 30, 2013) <http://www.governing.com/gov-data/military-civilian-active-duty-employee->



[workforce-numbers-by-state.html](#) ranks Maryland 12<sup>th</sup> among the states in active duty military population, but 4<sup>th</sup> in terms of total military and Navy civilians as follows:

State	Total Military Civilians	Navy Civilians
Virginia	94,506	43,851
California	61,986	35,457
Washington	50,253	16,347
Maryland	45,658	15,824

The Navy civilian population is especially important because approximately half of the state total works at NAS Patuxent River and its major tenant commands NAVAIR and NAWCAD.

In terms of veterans, Maryland averages more than the U.S. with 9.6% of its civilian population 18 years and over who are veterans. St. Mary's County has the highest concentration of veterans in Maryland. Neighboring Southern Maryland counties, Charles County ranks 2<sup>nd</sup> and Calvert County ranks 5<sup>th</sup> as follows:

Geographic Area	% of Pop.
St. Mary's County	16.7
Charles County	14.5
Talbot County	13.6
Anne Arundel County	13.3
Calvert County	13.0
Maryland	9.6

Source: Percent of the Civilian Population 18 Years And Over Who Are Veterans – State and County, 2009-2013 American Community Survey (ACS) 5-Year Estimates, U.S. Census Bureau <http://factfinder.census.gov>

## (2) Societal Need

While the MBA is a professional degree program, there is great societal and community benefit to be derived from offering this curriculum at this particular time. The region's rapid growth has attracted a highly skilled and educated workforce to Southern Maryland. This represents a global competitive advantage in know-how that's leveraged further by expanding this knowledge base with a local, residential cohort doctoral program in business. The MBA benefits regional recruitment and retention of skilled talent. Additionally, rapid regional growth has also brought major challenges in addressing public needs, both by local government agencies and community nonprofit organizations. Leadership in these sectors are prospective students who will learn new tools and techniques to address growth challenges. Additionally, the region will be improved by a greater number of highly educated community leaders putting in practice new business tools and techniques learned through the MBA.

- (b) If similar programs exist in the State, what are the similarities or differences in your program in terms of the degrees awarded, the areas of specialization, and the specific academic content of the programs?

There are several online or residential MBA programs offered throughout Maryland. For Southern Maryland students seeking traditional classroom delivery, Webster University offers a similar face-to-face MBA at SMHEC. The FIT MBA offers a face-to-face option for students in Southern Maryland.

- (c) Is a Maryland employer sponsoring/supporting the application for the program to be offered at this location? **No**

Course descriptions from the College's catalog

## **Master of Business Administration**

Major Code: 8300

Degree Awarded: Master of Business Administration

Age Restriction: N

Admission Status: graduate, online graduate, Extended Studies

Delivery Mode/s: online, blended online, classroom, off-site

Admission Materials: GMAT, GRE recommended

Location/s: Main Campus, Florida Tech University Online, Aberdeen, Fort Dix, Hampton Roads, Lakehurst, Melbourne Graduate Center, National Capital Region, Northeast, Orlando, Patuxent, Redstone/Huntsville, Spaceport - COB

The applicant to the master of business administration program must have a bachelor's degree; however, the degree need not be in business administration. Applicants who are graduates of non-business programs are also encouraged to apply. An applicant is assigned an advisor soon after acceptance into the MBA program, and should meet with the advisor to prepare a program plan outlining the courses needed for the MBA degree.

The admissions decision is based on a review of the application documentation including work experience, academic performance, references and written statement of purpose. Although taking the Graduate Management Admissions Test (GMAT) is not a requirement, it is highly recommended for admission consideration. Individuals who take the GMAT and obtain a satisfactory score can compensate for other criteria in their application (such as academic performance or work experience). Preference for graduate scholarships will be given to applicants who take the GMAT.\*

General admission requirements, student classifications and the process for applying are presented in the Academic Overview section. Additional requirements regarding admission and MBA requirements may be obtained from the associate dean of academics in the Nathan M. Bisk College of Business.

*\*The GRE may be substituted.*

### **Degree Requirements**

The MBA degree is conferred on a student who have successfully completed 36 credit hours of required and elective courses as listed on the student's approved Graduate Program Plan.

### **Program Prerequisites**

The following foundation courses are considered prerequisites to this program and will be waived for any student with an undergraduate degree in business or who has taken

undergraduate courses in accounting, economics and finance with a minimum grade of B.

BUS 5601 Essentials of Business Development 1 .....	3
BUS 5602 Essentials of Business Development 2 .....	3

The MBA degree requires completion of a common set of six core courses including the capstone course in strategic management, and an additional two directed electives (BUS 5000-level or higher) chosen with the approval of the faculty advisor. These required courses are designed to prepare the student to respond to the complex business decisions that arise in today’s rapidly changing environment. As such, these courses incorporate either case studies or projects that require extensive qualitative and/or quantitative analysis

**Core Courses**

BUS 5421 Managerial Economics.....	3
BUS 5431 Managerial Accounting.....	3
BUS 5440 Financial Management .....	3
BUS 5450 Organizational Behavior.....	3
BUS 5470 Marketing Management.....	3
BUS 5480 Strategic Management** .....	3
Directed Electives (BUS 5000-level or higher).....	6

\*\*This course serves as the Capstone for the MBA program.

In addition to the courses outlined above, students are also required to take four elective courses (three credit hours each). Electives can be taken with the faculty advisor’s approval from other graduate-level offerings in the Nathan M. Bisk College of Business or other colleges or academic units.

**Electives (4 courses)**

Students select their four electives from the catalog.....12

TOTAL CREDITS REQUIRED.....36

**Prerequisite and Required Courses and Course Descriptions**

<p><b>BUS 5601 ESSENTIALS OF BUSINESS DEVELOPMENT 1 (prerequisite, 0 credits)</b>  <i>Examines necessary tools required to plan and run a successful business venture. Requires integration of concepts, methods and models from accounting, economics and marketing in forming a business plan for a product or service in a case study. Requirement(s): First course in a two-course sequence</i></p>
<p><b>BUS 5602 ESSENTIALS OF BUSINESS DEVELOPMENT 2 (prerequisite, 0 credits)</b>  <i>Builds on BUS 5601. Examines and uses concepts, methods and models from the functional business areas of statistics, finance, management and law. Requires students to integrate each component into a complete business plan. Requirement(s): Second course in a two-course sequence. Prerequisite: BUS 5601</i></p>
<p><b>BUS 5421 MANAGERIAL ECONOMICS (3 credits)</b>  <i>Provides an understanding of the microeconomic forces that influence firm decision-making. Includes</i></p>

*competitive markets and market failure, benefit-cost analysis, demand estimation and forecasting, decision-making under risk and uncertainty, production and cost estimation, and market structure analysis.*

**BUS 5431 MANAGERIAL ACCOUNTING (3 credits).**

*Focuses on internal reporting to managers for use in planning and control, in making nonroutine decisions and in formulating major plans and policies. Covers cost-volume-profit relationships, flexible budgets and standards, job order and process cost, and cost allocation and accumulation.*

**BUS 5440 FINANCIAL MANAGEMENT (3 credits)**

*Studies the concepts and tools of corporate financial management and financial planning, including capital budgeting, capital structure and net working capital. Considers the importance of ethics in financial decision-making.*

**BUS 5450 ORGANIZATIONAL BEHAVIOR (3 credits)**

*Presents existing research, theories and models explaining how individual and group behavior and processes shape the internal dynamics of organizations. Provides the foundation to understand contemporary debates, concerning alternative organizational designs and management practices.*

**BUS 5470 MARKETING MANAGEMENT (3 credits)**

*Examines the tools and techniques of managing marketing activities as well as an analysis of the marketing process. Emphasizes decision-making, the refinement of skills needed to recognize and solve marketing problems, and effective communication of recommendations. Uses case analysis extensively.*

**BUS 5480 STRATEGIC MANAGEMENT (3 credits)**

*In-depth analysis of industries and competitors, and how to build and defend competitive advantages in forming a successful competitive strategy. Case analysis and management simulation convey the multifunctional nature of decision making at the top management level. Augmented by live-case analyses.*

*Requirement(s): Must be taken in the final semester before graduation.*

**Electives (4 courses)**

In addition to the eight required courses, students are also required to take four elective courses (three credit hours each). Electives can be taken with the faculty advisor's approval from other graduate-level offerings in the Nathan M. Bisk College of Business or other colleges or academic units.

TOTAL CREDITS REQUIRED.....36

## **Flight Test Engineering, Graduate Certificate**

Major Code: 8245

Degree Awarded: Graduate Certificate

Age Restriction: No

Admission Status: Graduate

Delivery Mode/s: Classroom

Admission Materials: GRE\*

Location/s: Main Campus-Melbourne, Patuxent

The Flight Test Engineering program seeks to expand student knowledge, skills, ability and competency in the field of aircraft flight testing. Flight test engineering views the aircraft design problem from the perspective of evaluating the performance of an existing aircraft, rather than from the perspective of designing an airplane to meet performance specifications.

The core courses that comprise the Certificate teach the engineer how to test an aircraft safely, measure aircraft performance and determine its flying qualities. The program teaches students the necessary measurement techniques, instrumentation, and the data analysis methods required to collect and reduce flight test data to standard atmospheric conditions, expand the results for publication in pilot operating handbooks, and for use in improving the design of future aircraft.

### **Admission Requirements**

An applicant should have an undergraduate major in a field related to aerospace engineering. Applicants whose bachelor's degrees are in other fields are normally required to take some undergraduate coursework in addition to the program described below, as determined by the department head. Applications are also invited from graduates with undergraduate degrees in the physical sciences or mathematics. In these cases, at least one year of undergraduate coursework in aerospace or mechanical engineering is normally required before starting the certificate program. In evaluating an international application, due consideration is given to academic standards in the country where the undergraduate studies have been performed.

\*Certificate applicants may need to take the GRE (general test only).

Applicants from foreign countries must meet the same requirements as applicants from the United States.

General admission requirements and the process for applying are presented in the Academic Overview section.

### **Required Courses (4 courses)**

ENM 5200 Project Engineering .....	3
MAE 5701 Airplane Performance Flight Test Engineering .....	3
MAE 5702 Airplane Stability and Control Flight Test Engineering .....	3
MAE 5703 Airplane Avionics Flight Test Engineering .....	3
TOTAL CREDITS REQUIRED.....	12

**Required Courses and Course Descriptions**

<p><b>ENM 5200 PROJECT ENGINEERING (3 credits)</b>  <i>Principles of project management to design and develop products and services within budget, on time and to specification. Includes work planning, organization design, requirements analysis, project control and PERT/CPM.</i></p>
<p><b>MAE 5701 AIRPLANE PERFORMANCE FLIGHT TEST ENGINEERING (3 credits).</b>  <i>Examines flight test engineering techniques to determine airplane performance. Includes flight labs for data collections. Presents data analysis and interpretation methods, and uses airplane performance theory to develop the equations necessary to reduce flight test data taken at altitude to sea-level. Covers both propeller and jet aircraft.</i>  <i>Requirement(s): Program chair approval</i></p>
<p><b>MAE 5702 AIRPLANE STABILITY AND CONTROL FLIGHT TEST ENGINEERING (3 credits)</b>  <i>Examines techniques to evaluate airplane stability and control by flight testing. Includes flight labs for flight test data collection. Presents methods for stick fixed and stick free extrapolation of stability neutral points and control characteristics. Also includes effects of high speed and transonic flight due to aircraft configuration.</i>  <i>Requirement(s): Program chair approval</i></p>
<p><b>MAE 5703 AIRPLANE AVIONICS FLIGHT TEST ENGINEERING (3 credits)</b>  <i>Reviews current avionics systems for testing in flight. Includes flight labs to demonstrate testing methods and data collection. Also includes communications and navigation systems, sensor systems, avionics systems integration, human factors and radar for severe weather avoidance systems and tests to determine stability.</i>  <i>Requirement(s): Program chair approval</i></p>

TOTAL CREDITS REQUIRED.....	12
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Taken from 2017-2018 University Catalog:  
<http://catalog.fit.edu/content.php?catoid=5&navoid=175>

## **Flight Test Engineering, M.S.**

Major Code: 8233

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode/s: Classroom

Admission Materials: GRE

Location/s: Main Campus-Melbourne, Patuxent, Northeast

The Master of Science in Flight Test Engineering seeks to expand student knowledge, skills, ability and competency in the field of aircraft flight testing. Flight test engineering views the aircraft design problem from the perspective of evaluating the performance of an existing aircraft, rather than from the perspective of designing an airplane to meet performance specifications.

The core courses teach the engineer how to test an aircraft safely, measure aircraft performance and determine its flying qualities. The program teaches students the necessary measurement techniques, instrumentation, and the data analysis methods required to collect and reduce flight test data to standard atmospheric conditions, expand the results for publication in pilot operating handbooks, and for use in improving the design of future aircraft.

Elective courses provide advanced graduate instruction in fundamental disciplines pertinent to the flight test engineer, such as structural dynamics, propulsion, aerodynamics, stability and control, signal processing, radar, communications and engineering project management.

Additionally, the program teaches students how to test and evaluate the aircraft's various mechanical and electrical subsystems including propulsion, structure and avionics.

### **Admission Requirements**

An applicant should have an undergraduate major in a field related to aerospace engineering. Applicants whose bachelor's degrees are in other fields are normally required to take some undergraduate coursework in addition to the program described below, as determined by the department head. Applications are also invited from graduates with undergraduate degrees in the physical sciences or mathematics. In these cases, at least one year of undergraduate coursework in aerospace or mechanical engineering is normally required before starting the master's program. In evaluating an

international application, due consideration is given to academic standards in the country where the undergraduate studies have been performed. Master's applicants should take the GRE (general test only). Applicants from foreign countries must meet the same requirements as applicants from the United States.

General admission requirements and the process for applying are presented in the [Academic Overview](#) section.

### **Degree Requirements**

The Master of Science in Flight Test Engineering is offered with both thesis and nonthesis options requiring a minimum of 30 semester credit hours of coursework. Up to six credit hours of thesis may be included in the 30-credit-hour requirement. Before completing nine credit hours, the student must submit a master's degree program plan to indicate the specific courses to be taken.

### **Thesis Option**

The thesis may be primarily analytical, computational or experimental; or it can be some combination of these. In each case, students must demonstrate the ability to read the appropriate engineering literature, to learn independently and to express themselves well technically, both orally and in writing.

### **Nonthesis Option**

The nonthesis option replaces the six credit hours of theses with approved electives and a final program examination, following approval of a written petition submitted to the program chair.

### **Required Courses (6 courses)**

ENM 5200 Project Engineering .....	3
MAE 5701 Airplane Performance Flight Test Engineering .....	3
MAE 5702 Airplane Stability and Control Flight Test Engineering .....	3
MAE 5703 Airplane Avionics Flight Test Engineering .....	3
Mathematics (2 courses)	
Students select their two mathematics courses from the list .....	6

### **Electives (4 courses)**

Students select their four electives from the list (may include 6 credit hours of thesis).....	12
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TOTAL CREDITS REQUIRED.....	30
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## Required Courses and Course Descriptions

<p><b>*ENM 5200 PROJECT ENGINEERING (3 credits)</b>  <i>Principles of project management to design and develop products and services within budget, on time and to specification. Includes work planning, organization design, requirements analysis, project control and PERT/CPM.</i></p>
<p><b>*MAE 5701 AIRPLANE PERFORMANCE FLIGHT TEST ENGINEERING (3 credits).</b>  <i>Examines flight test engineering techniques to determine airplane performance. Includes flight labs for data collections. Presents data analysis and interpretation methods, and uses airplane performance theory to develop the equations necessary to reduce flight test data taken at altitude to sea-level. Covers both propeller and jet aircraft.</i>  <i>Requirement(s): Program chair approval</i></p>
<p><b>*MAE 5702 AIRPLANE STABILITY AND CONTROL FLIGHT TEST ENGINEERING (3 credits)</b>  <i>Examines techniques to evaluate airplane stability and control by flight testing. Includes flight labs for flight test data collection. Presents methods for stick fixed and stick free extrapolation of stability neutral points and control characteristics. Also includes effects of high speed and transonic flight due to aircraft configuration.</i>  <i>Requirement(s): Program chair approval</i></p>
<p><b>*MAE 5703 AIRPLANE AVIONICS FLIGHT TEST ENGINEERING (3 credits)</b>  <i>Reviews current avionics systems for testing in flight. Includes flight labs to demonstrate testing methods and data collection. Also includes communications and navigation systems, sensor systems, avionics systems integration, human factors and radar for severe weather avoidance systems and tests to determine stability.</i>  <i>Requirement(s): Program chair approval</i></p>

\* These courses comprise the Graduate Certificate

## Mathematics (2 courses)

<p><b>MTH 5102 LINEAR ALGEBRA (3 credits)</b>  <i>Linear algebra, systems of linear equations and Gauss elimination method; inverses, rank and determinants; vector spaces; linear transformations, linear functional and dual spaces; eigenvalues, eigenvectors; symmetric, Hermitian and normal transformations; and quadratic forms.</i>  <i>Requirement(s): Undergraduate course in multivariable calculus or linear algebra</i></p>
<p><b>MTH 5130 THEORY OF COMPLEX VARIABLES (3 credits)</b>  <i>Topology of the complex plane, analytic functions, Cauchy's integral formula, Liouville's theorem, maximum modulus theorem, Taylor and Laurent series, singularities, residue theorem, analytic continuation, entire functions, infinite product representation and conformal mapping.</i>  <i>Prerequisite: MTH 2202, MTH 4101</i></p>
<p><b>MTH 5201 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 1 (3 credits)</b>  <i>Fourier series and their convergence properties; Sturm-Liouville eigenfunction expansion theory; Bessel and Legendre functions; solution of heat, wave and Laplace equations by separation of variables in Cartesian coordinates.</i>  <i>Prerequisite: MTH 2001, MTH 2201</i></p>
<p><b>MTH 5202 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 2 (3 credits)</b>  <i>Solution of heat, wave and Laplace equations by separation of variables in cylindrical and spherical coordinates. Associated Legendre functions, hypergeometric functions and spherical harmonics. Fourier transforms and separation of variable for heat and wave equations on infinite intervals. Vector integral calculus.</i>  <i>Prerequisite: MTH 5201</i></p>
<p><b>MTH 5401 APPLIED STATISTICAL ANALYSIS (3 credits)</b>  <i>Covers statistical distributions, statistical tests for data, least squares and regression, estimations, tests of hypotheses, analysis of variance, planning and designing research experiments, randomized blocks, Latin and Graeco-Latin squares and data reduction, analysis using ANOVA (analysis of variance) and other</i></p>

methods.

Prerequisite: MTH 2001

**MTH 5411 MATHEMATICAL STATISTICS 1 (3 credits)**

Covers discrete and continuous random variables, generating and moment generating functions, multivariate distributions, covariance and correlation, sums of independent random variables, conditional expectation, Central Limit Theorem, Markov and Chebyshev inequalities and the Law of Large Numbers.

Requirement(s): Undergraduate courses in multivariable calculus and linear algebra

**MTH 5412 MATHEMATICAL STATISTICS 2 (3 credits)**

Includes maximum likelihood and Bayes estimators, confidence intervals, testing hypotheses, uniformly most powerful tests, nonparametric methods (chi-square and Kolmogorov-Smirnov goodness-of-fit tests) and regression analysis.

Prerequisite: MTH 5411

**Electives (4 courses)**

**AVF 5303 AIRPLANE AVIONICS FLIGHT TEST ENGINEERING (3 credits)**

Consists of lectures and flight laboratories involving airplane avionics flight test evaluation theory and practice. Includes flight test profile planning, data collection in an instrumented airplane, and data reduction for analysis and publication.

Requirement(s): Requires prior completion of foundation requirements

**ECE 5245 DIGITAL SIGNAL PROCESSING 1 (3 credits)**

Describes discrete-time signals in the time and frequency domains; z-transform, discrete Fourier transform, FFT algorithms; introduction to classical digital filter design techniques; and filter banks.

**ECE 5251 RADAR SYSTEMS (3 credits)**

Covers characteristics of radar, prediction of range and performance, types of radar (pulse-Doppler, MTI, CW, etc.); modern radar technologies, phased-array systems, clutter, jamming and introduces signal processing methods.

**ECE 5350 OPTICAL ELECTRONICS (3 credits)**

Principles of stimulated emission; electromagnetic field modes in optical resonators; ray tracing techniques in laser resonators and beam delivery systems; Gaussian beam profiles and laser linewidths; noise in lasers and optical amplifiers; excitation methods; mode locking and Q-switching techniques; picosecond and femtosecond laser pulse generation; optical bitable devices.

**ECE 5425 ANTENNAS 1 (3 credits)**

Reviews basic electromagnetic principles; radiation from infinitesimal electric and magnet dipoles; antenna directivity and gain; the one-way and radar range equations; array theory and phased arrays; and wire antennas and broadband antennas.

**MAE 4024 MECHANICAL VIBRATIONS (3 credits)**

Focuses on both discrete and continuous systems. Includes free and forced vibration of single and multiple degrees of freedom systems, and vibration control techniques.

Prerequisite: MAE 2082, MAE 3083, MTH 2201

**MAE 5120 AERODYNAMICS OF WINGS AND BODIES (3 credits)**

Approximate analytic solution of nonlinear problems in aerodynamics (including those associated with the effects of compressibility) by iterative methods that exploit the smallness of small parameter; flow about slender wings and bodies; flow about wings with high-aspect ratio.

**MAE 5320 INTERNAL COMBUSTION ENGINES (3 credits)**

Investigates the applications of thermodynamic, fluid dynamic and combustion principles to spark- and compression-ignition engines, and direct-injection stratified charge engines; ideal and actual cycle analyses; exhaust emissions, air pollution and control; engine heat transfer, and engine modeling.

Prerequisite: MAE 5310

**MAE 5486 CRASHWORTHINESS (3 credits)**

Introduces the design of vehicles to protect occupants during collision. Includes trauma biomechanics, crash

*mechanics, structural crashworthiness, computer simulation of occupant motion and dynamic structural behavior. Draws examples from aeronautical and automotive applications.*

*Requirement(s): Instructor approval*

**MAE 5801 ADVANCED FLIGHT DYNAMICS AND CONTROLS (3 credits)**

*Includes static and dynamic stability of flight, modern treatment of flight dynamics, detailed longitudinal and lateral-directional flight motions, effect of nonlinearity, flight under disturbances and handling qualities. Reviews classical and modern control theories, flight control strategies, and flight augmentation systems and autopilots.*

*Prerequisite: MAE 4014, MAE 4242*

**MAE 5802 MULTIVARIABLE FEEDBACK CONTROL SYSTEMS (3 credits)**

*Includes modern analysis and control design approaches for linear multivariable systems. Includes modeling of dynamic systems, concept of controllability and observability, eigenstructure assignment technique, singular value decomposition, stability robustness and optimum control methods.*

*Prerequisite: MAE 4014*

**MAE 5803 NONLINEAR CONTROL SYSTEMS (3 credits)**

*Includes nonlinear system fundamentals (stability and dynamic peculiarities, methods of nonlinear analysis); basic nonlinear control methods (sliding control and feedback linearization, multidimensional extension); advanced nonlinear control methods (adaptive control, neural networks); and nonlinear control applications.*

*Prerequisite: MAE 5802*

**MAE 5804 GUIDANCE AND NAVIGATION OF AEROSPACE VEHICLES (3 credits)**

*Includes the principles for guidance and navigation of spacecraft, launch vehicles and missiles. Applied nonlinear programming, calculus of variations and optimal control to flight and trajectory optimization. Covers ballistic and adaptive pursuit guidance; orbit determination and celestial navigation; recursive navigation; GPS and Kalman filtering.*

*Prerequisite: MAE 5802.*

**SYS 5360 ELECTROOPTICS/INFRARED SYSTEMS ENGINEERING (3 credits)**

*Introduces optical systems engineering and associated principles, methods and techniques. Provides a systems engineering view of the optical system including source characterization, optical propagation, the effects of the atmosphere, optics and imaging, detectors, image and signal processing and displaying the resulting information.*

TOTAL CREDITS REQUIRED.....30

## **Engineering Management, M.S.**

Major Code: 8075

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode/s: Classroom

Admission Materials: 2 letters of recommendation, resume, objectives, GRE\*

Location/s: Main Campus-Melbourne, Aberdeen, Hampton Roads, Northeast, Orlando, Patuxent, Redstone/Huntsville

The Master of Science in Engineering Management meets the professional needs of the engineer who, although working in a technical field, finds it necessary to update his or her skills in engineering, as well as acquire knowledge in the management of other engineers. Typically, engineers find that as they advance in their chosen fields, the challenges of management increasingly play a role in the overall responsibilities of the position. Many find their careers would best be served by a program addressing the management challenges of their job responsibilities. This interdisciplinary program is designed for those individuals.

### **Admission Requirements**

An applicant for the master's program in engineering management should have a bachelor's degree from an ABET-accredited engineering program, though applicants with bachelor's degrees in physical sciences, computer science or mathematics will also be considered.

\*Applicants who have an undergraduate GPA of less than 3.0 on a 4.0 scale may be asked to submit two letters of recommendation, a résumé, a statement of objectives and GRE results. All students are required to have a combined verbal/quantitative GRE score of 300 or higher (using the 130-170 point per part scoring system).

International applicants for whom English is not their primary language must submit paper-based TOEFL scores of 550 (or the equivalent computer- or Internet-based scores) or higher in addition to the GPA requirement.

General admission requirements and the process for applying are presented in the Academic Overview section.

### **Degree Requirements**

The Master of Science in Engineering Management is conferred upon students who have successfully completed 30 credit hours of graduate coursework plus other course requirements as outlined below. Students without adequate undergraduate courses in linear and matrix algebra, calculus, probability theory and/or statistics will be required to make up these deficiencies. Courses taken to satisfy these deficiencies or any other

admission prerequisites cannot be counted toward the degree requirements. Thesis students must complete a minimum of six semester credit hours of thesis ([ENM 5999](#)). More credit hours may be necessary to satisfactorily complete the thesis requirements, but only six may be counted toward the degree requirements. Nonthesis students must pass a final program examination during their final semester before graduation.

**Curriculum**

The master of science degree program consists of a set of required core courses and a set of elective courses as outlined below. Students who are newly admitted to the program must submit a program plan of study and have that program plan approved by their designated advisor and department head before registering for any course to be applied toward graduation requirements. Students must not register for any courses not on their approved program plan without the approval of their advisor and department head. Students pursuing this degree as a second or subsequent graduate degree must complete the change of major process and new program plan at least two semesters before graduation and no later than four weeks after starting the program. Only graduate courses in engineering, physical sciences, computer science or mathematics may be counted as transfer credit from the first graduate degree program.

There are five required core courses that all students must take, as listed below. Nonthesis students must take an additional five elective courses, subject to the restriction shown. Thesis students will substitute six semester credit hours of thesis for two elective courses.

**Required Courses (5 courses)**

ENM 5100 Quality Engineering .....	3
ENM 5200 Project Engineering .....	3
ENM 5330 Topics in Engineering Operations and Logistics .....	3
ENM 5420 Technology Commercialization Strategies .....	3
ENM 5430 Strategic Situation Analysis Using Game Theory .....	3

**Electives (5 courses)**

Students may select elective courses from a comprehensive list of elective courses maintained by the department (see addendum) and may include up to six credit hours of Thesis .....15

TOTAL CREDITS REQUIRED.....30

**Required Courses and Course Descriptions**

<p><b>ENM 5100 QUALITY ENGINEERING (3 credits)</b>  <i>Principles and techniques for establishing quality goals, identification of customer needs and requirements, measurement of quality objectives and product/process engineering to improve system performance.</i></p>
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<p><b>ENM 5200 PROJECT ENGINEERING (3 credits).</b>  <i>Principles of project management to design and develop products and services within budget, on time and to specification. Includes work planning, organization design, requirements analysis, project control and PERT/CPM.</i></p>
<p><b>ENM 5330 TOPICS IN ENGINEERING OPERATIONS AND LOGISTICS (3 credits)</b>  <i>Topics such as forecasting, plant location, facility layout, inventory systems, maintenance, process engineering supply chains, scheduling, manufacturing and materials handling.</i></p>
<p><b>ENM 5420 TECHNOLOGY COMMERCIALIZATION STRATEGIES (3 credits)</b>  <i>Systematically covers state-of-the-art technical, marketing and business aspects of technology commercialization in 18 steps through three phases and the investigation, feasibility, development, introduction, growth and maturity stages.</i></p>
<p><b>ENM 5430 STRATEGIC SITUATION ANALYSIS USING GAME THEORY (3 credits)</b>  <i>Presents a study of situations encountered on a regular basis by managers and engineers. Introduces and uses principles of game theory to analyze those situations in order to develop sound bases for drawing appropriate conclusions and achieving optimal results. Also provides insight into why certain situations function the way they do.</i></p>

**Electives (5 courses)**

<p><i>Students may select elective courses from a comprehensive list of elective courses maintained by the department (see addendum and <a href="http://coe.fit.edu/se/electives.php">http://coe.fit.edu/se/electives.php</a> for complete list) and may include up to six credit hours of Thesis.</i></p>
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TOTAL CREDITS REQUIRED.....30



## Recent Approval Letter



**MHEC**

Creating a state of achievement

Larry Hogan  
Governor

Boyd K. Rutherford  
Lt. Governor

Anwer Hasan  
Chairperson

Jennie C. Hunter-Cevera  
Acting Secretary

August 28, 2015

Dr. Anthony James Catanese  
President  
Florida Institute of Technology  
150 West University Blvd.  
Melbourne, FL 32901

Dear President Catanese:

The Maryland Higher Education Commission has received an application from Florida Institute of Technology to renew eight existing programs and two areas of concentration within an approved program at Aberdeen Proving Ground, located at 320 Johnson Street, MD 21005, to renew one program and two areas of concentration within an approved program and offer one new program at the Southern Maryland Higher Education Center, located at 44219 Airport Road, California, MD 20619, and to discontinue all operations at Fort Detrick. I am pleased to inform you that Florida Institute of Technology is authorized to offer the programs listed below at these locations until August 31, 2020.

Approved programs:

Aberdeen Proving Ground (APG)

- I. Master of Business Administration (M.B.A.)
- II. M.S. in Acquisition and Contract Management
- III. M.S. in Engineering Management
- IV. M.S. in Management
- V. M.S. in Human Resource Management
- VI. M.S. in Operations Research
- VII. M.S. in Project Management
  - a. A.O.C. in Information Systems
  - b. A.O.C. in Operations Research
- VIII. M.S. in Systems Management

Southern Maryland Higher Education Center (SMHEC)

- I. Master of Science (M.S.) in Project Management
  - a. A.O.C. in Information Systems
  - b. A.O.C. in Operations Research
- II. Doctor of Business Administration (DBA)

Discontinued program:


Fort Detrick

- I. P.B.C. in Project Management

An electronic renewal form and the regulations for out-of-state institutions are available on the Commission's website under "Academic Approval Process" at [www.mhec.state.md.us](http://www.mhec.state.md.us). In order to operate at the approved location after the stated expiration date, the renewal application should be completed and submitted to this office no later than five months before the institution proposes to commence operation for the academic year 2020-2021. If applicable, the use of VA benefits for these programs should be coordinated through Ms. Trish Gordon-McCown, Associate Director -Veterans Affairs. She can be reached at 410-767-3098.

Please keep us informed of any changes contemplated in your offerings in Maryland. We look forward to continuing the cooperative relationship developed between your institution and the Maryland Higher Education Commission.

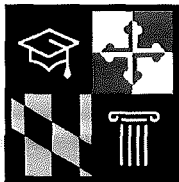
Sincerely,



Jennie C. Hunter-Cevera, Ph.D.  
Acting Secretary of Higher Education

JCHC:JVF:mrw

C: Dr. Robert Schaller, Site Director, Florida Institute of Technology



**MHEC**

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Governor

Boyd K. Rutherford  
Lt. Governor

Anwer Hasan  
Chairperson

James D. Fielder, Jr., Ph.D.  
Secretary

December 22, 2016

Dr. Anthony James Catanese  
President  
Florida Institute of Technology  
150 West University Blvd.  
Melbourne, FL 32901

Dear President Catanese:

The Maryland Higher Education Commission has received a request from the Florida Institute of Technology to add four new programs to its current extended approval at the Southern Maryland Higher Education Center. I am pleased to inform you that the Florida Institute of Technology is authorized to offer the programs as listed below until August 31, 2020.

Approved programs:

- I. Master of Science (M.S.) in Technology Management
- II. Master of Science (M.S.) in Logistics Management
- III. Master of Science (M.S.) in Management – Area of Concentration in Logistics Management
- IV. Bachelor of Science (B.S.) in Logistics Management (completion program)

An electronic renewal form and the regulations for out-of-state institutions are available on the Commission's website under "Academic Approval Process" at [www.mhec.maryland.gov](http://www.mhec.maryland.gov). In order to operate at the approved locations after the stated expiration date, the renewal application should be completed and submitted to this office no later than five months before the institution proposes to commence operation for the academic year 2020-2021. If applicable, the use of VA benefits for these programs should be coordinated through Ms. Trish Gordon-McCown, Associate Director of Veterans Affairs. She can be reached at 410-767-3098.

Please keep us informed of any changes contemplated in your offerings in Maryland. We look forward to continuing the cooperative relationship developed between your institution and the Maryland Higher Education Commission.

Sincerely,

James D. Fielder, Jr., Ph.D.  
Secretary

JDF:MK:jmc

C: Dr. Robert Schaller, Director, Patuxent Site, Florida Institute of Technology