

Florida Institute of Technology's renewal application to
operate as an out-of-state institution in Maryland in
accordance with COMAR 13B.02.01

Aberdeen Proving Ground

MARYLAND HIGHER EDUCATION COMMISSION

Application for Renewal Approval for Out-of-State Degree-Granting Institutions to Operate in Maryland

Please Note: A separate application form must be completed and submitted with all supporting documentation for each proposed location in Maryland. If an additional, new location is being proposed, an Application for Renewal of Approval must be submitted for that location.

PREVIOUSLY APPROVED LOCATION IN MARYLAND.

Please provide the complete mailing address.

Florida Institute of Technology
6488 Rodman Road, Building 4305 Room 211
Aberdeen Proving Ground, MD 21005

PROPOSED START DATE OF CONTINUED OPERATION. August 15, 2020

Applications should be submitted at least 5 months prior to the proposed start date.

NAME AND ADDRESS OF INSTITUTION APPLYING FOR APPROVAL.

Name of Institution: Florida Institute of Technology
150 West University Boulevard
Melbourne, FL 32901-6975

Web Address: <http://www.fit.edu/>

OPEID Code: 146900

U.S. Department of Education, Office of Postsecondary Education, ID Code -- Title IV eligibility.

Chief Executives Officer: T. Dwayne McCay

Mailing Address: Florida Institute of Technology
150 West University Boulevard
Melbourne, FL 32901-6975

Telephone: 321-674-7232

Email: dmccay@fit.edu

Institutional Liaison: Name and title of the individual who will serve as liaison to the Maryland Higher Education Commission:

Name: Robert R. Schaller, Sr.

Title: Director

Mailing Address: 44219 Airport Rd., Bldg 2
California, MD 20619

Telephone: 301-737-2500 x219

Email: schaller@fit.edu

***** CERTIFICATION *****

I hereby affirm that the answers given in this application and its attachments are accurate and complete and further agree to comply with the *Annotated Code of Maryland* and State regulations governing the operation of out-of-State degree-granting institutions (COMAR 13B.02.01).

<u>3/23/2020</u> Date	 Signature of Chief Executive Officer
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Please Submit All Information To:

Maryland Higher Education Commission
Division of Planning and Academic Affairs
6 N. Liberty Street, 10th Floor
Baltimore, MD 21201
410-767-3268
acadprop@mhec.state.md.us

A copy of these regulations can be found at the Maryland Higher Education Commission's web site www.mhec.state.md.us (under Academic Approval Process) along with an on-line application form.

I. DURATION OF APPROVAL

Approval to operate at a previously approved location in Maryland must be renewed annually. However, "during of after the fifth year of operation in Maryland and during any subsequent renewal cycle, an out-of-State institution may apply for approval to operate in Maryland for an extended period of time up to 5 years." COMAR 13B.02.01.08C(1)

If the location for which you are applying has been annually approved for at least five years, do you wish to seek approval to operate in the State for an extended period of time of up to 5 years?

☒ Yes, we wish to be approved for 5 years.

II. SUPPORTING DOCUMENTATION

Only a complete application can be acted upon. While separate application forms must be completed and submitted for each approved location, the following Supporting Documentation needs to be included only once for each entire package of applications. **CHECK EACH ITEM AS ATTACHED.**

☒ Catalogs and Other Institutional Publications. COMAR 13B.02.01.20A(1)

Have your catalogs, other institutional publications, or awards changed since they were last submitted? ☒ Yes ☐ No If yes, please submit new copies.

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The institution shall submit a non-refundable application fee in the amount of (a) \$7,500 for up to two degree programs and (b) an additional \$850 for each degree program over two programs. The institution's check should be made payable to: Maryland Higher Education Commission. The application renewal fee will be waived for renewals of out-of-state institutions operating at Regional Maryland Higher Education Center.

- ☒ Accreditation. (Must accompany all renewals) COMAR 13B.02.01.08B(4)(g)

Provide a copy of the most recent letter of approval (notification) from an organization recognized as an accrediting agency by the U.S. Department of Education. Along with your most recent notification of institutional accreditation, please provide evidence that you are in compliance with that organization's policies and procedures related to off-campus educational activities. If any of your proposed programs require program accreditation provide evidence of that accreditation.

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COMAR 13B.02.01.08B(4)(f)

To transact interstate business in Maryland, the institution must qualify with the State Department of Assessments and Taxation by making the certification required in the Corporations and Associations Article, §7-202, Annotated Code of Maryland. A public institution is not required to qualify as a foreign corporation. However, a business entity affiliated with a public institution or a private institution (profit or non-profit) must qualify as a foreign corporation. The Foreign Corporation Qualification Form may be obtained from the Maryland Department of Assessments and Taxation, Room 809, 301 West Preston Street, Baltimore, Maryland 21201 or on-line at: www.dat.state.md.us. Once qualified, the institution must provide a copy of the certificate of good standing issued by the State Department of Assessments and Taxation.

- ☒ Certificate of Compliance With Fire and Safety Codes (Must accompany all renewals)
COMAR 13B.02.01.08B(4)(o)

Please provide a certificate for each approved location for indicating that the proposed facility has been inspected and is found in compliance with local and State ordinances pertaining to fire and safety.

- ☒ Board of Trustees Resolution of Financial Solvency (Must accompany all renewals)
COMAR 13B.02.01.08B(4)(e)

Please provide a resolution from your Board of Trustees addressed to the Secretary of Higher Education stating that your institution is financially solvent.

- ☒ Advertisements COMAR 13B.02.01.07D(3)(p)

Are there new advertisements in print format related to your programs in Maryland?
☒ Yes ☐ No **If yes, please provide copies of the new advertisements.**

- ☒ Enrollment Data as Prescribed by the Secretary. (Must accompany all renewals)
COMAR 13B.02.01.08B(4)(q)

Please provide the information requested on the Student Enrollment Data Form found at the end of this application.

- ☒ Teach-out Plan (Must accompany all renewals) COMAR 13B.02.01.08B(4)(j)(iv)

The institution must provide a copy of its teach-out plan allowing enrolled students to complete their programs if the institution decides to cease operation in Maryland.

II. APPLICATION QUESTIONNAIRE

This questionnaire, properly completed with supporting documentation, shall serve as an application for approval to operate in Maryland under the *Code of Maryland Regulations* (COMAR) 13B.02.01. It must be completed for each proposed location.

1. Programs.

➤ CURRENTLY OFFERED PROGRAMS.

INSTRUCTIONS. Please enter the requested information on your **CURRENTLY OFFERED PROGRAMS** in the spaces provided below, or create an attachment (labeled "A-1: Current Programs") to this application with the required information.

(a) Provide a list of your currently offered programs at this location. For each program provide the following information: (1) the full title of the program; (2) the degree or certificate to be awarded; (3) the mode of instructional delivery; (4) the number of credit hours (semester or quarter); and (5) whether they are offered at the parent campus.

Program Title	Degree	Mode of Instruction	Total Credit Hours	Offered on Main Campus Yes / No
<i>Example: Organizational Management</i>	<i>M.S.</i>	<i>Classroom</i>	<i>36 sem</i>	<i>Yes</i>
<i>Example: Business Administration</i>	<i>B.S.B</i>	<i>Distance Ed.</i>	<i>120 sem</i>	<i>Yes</i>

➤ NEW PROGRAMS

INSTRUCTIONS. Is the institution proposing any new programs at this location? ☐ Yes ☒ No
If yes, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-1: New Programs") to this information with your responses to the following for each new program:

- (a) Provide a list of the new programs at this location. For each new program provide the following information: (1) the full title of the program; (2) the degree or certificate to be awarded; (3) the mode of instructional delivery; (4) the number of credit hours (semester or quarter); and (5) whether they are offered at the parent campus.

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- (b) If the information does not appear in the catalog or publication you submitted provide (1) a description of the curriculum; (2) the objectives of each course; and (3) a course schedule for the proposed location

- (c) Please provide a brief description of the student population to be served by the proposed new programs.

2. Educational Need. Before the Commission may evaluate the readiness of an out-of-State institution to operate or award new degrees in the State, including the offering of an instructional program or a degree level not previously approved, the institution shall present evidence demonstrating the educational need to establish operations, offer programs, and award the degrees in question in the State. In addition, the out-of-State institution shall demonstrate that the proposed program, for which the institution is making application, meets a critical and compelling regional or Statewide need and is consistent with the Maryland Postsecondary Education. COMAR 13B.02.01.06A&C

INSTRUCTIONS: Please enter the requested information in the spaces provided below, or create an attachment (labeled "A-2: Educational Need") to this application and respond to the following questions for each new program:

- (a) What critical and compelling Regional or Statewide (Maryland) need and demand do your proposed programs meet? In responding to this question provide documentation as indicated below:

(1) If the programs serve occupational needs, present data projecting market demand and the availability of openings in the job market to be served by the new programs for which the

institution is making application. This information may include workforce and employment projections prepared by the federal and State governments, the availability of graduates in the State or region, marketing studies done by the institution or others, and material from professional and trade associations.

(2) If the programs serve societal needs (include the traditional liberal arts education), provide a Description of how the proposed programs will enhance higher education in Maryland and contribute society

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

(c) Is a Maryland employer sponsoring/supporting the application for the program(s) to be offered at this location?

☐ Yes ☐ No

If yes, please attach a letter of support from the employer addressed to the Assistant Secretary, Planning and Academic Affairs. The letter should outline the employer's reasons for selecting the institution and its programs and state the benefits to the employees who participate in the program

3. Administrative Staff. The out-of-State institution shall provide for an on-site administrative staff responsible for overall administrative operation of educational activities including counseling, advising, testing orientation, financial aid services, and maintenance of academic records. In addition to being responsible for the administration of the policies and procedures of the parent institution, the designated administrators are responsible for meeting the expectations set forth in this chapter [of the Regulatory Standards of the State of Maryland for Out-of-State Institutions]. The duties and size of the staff shall be adequate for the size of the educational activities offered. COMAR 13B.02.01.15

INSTRUCTIONS: Has any previously reported Administrative Staff information changed since your last approval at this location? ☒ Yes ☐ No

If yes, please enter the requested information in the spaces provided below, or create an attachment labeled (labeled "A-3: Administrative Staff Changes") to this application with any changes to the following questions:

(a) How are you planning to meet the above standard on Administrative Staff?

(b) Who will be assigned to carry-out each of these duties? Please include a curriculum vitae/resume for each administrator.

4. Faculty

INSTRUCTIONS: Has any previously reported Faculty information changed since your last approval at this location? ☒ Yes ☐ No

If yes, please enter the requested information in the spaces provided below, or create an attachment labeled (labeled "A-4: Faculty Changes") with any changes to the following questions:

(a) List all faculty that are to teach in the first year (or cycle) of the programs at this location. For each faculty member provide the following information: COMAR 13B.02.01.08(4)(m)

- (1) the course(s) the faculty might soon teach;
- (2) the degrees the individual holds
- (3) the degrees areas of specialization; and
- (4) whether or not the faculty member is full-time or part-time (adjunct) at your parent institution

(b) Please include a curriculum vitae/resume for each potential faculty member. For those faculty who are yet to be hired include a job description and minimal qualifications.

5. Library Resources. Out-of-State Institutions offering programs or courses, or both, in Maryland, shall provide adequate and appropriate library resources within State boundaries and within reasonable distance of the instructional site. Usage statistics shall be kept to determine to what extent these resources are available and accessible. COMAR 13B.02.01.17A

INSTRUCTIONS: Has any previously reported library information changed since your last approval at this location? ☐ Yes ☒ No

If yes, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-5: Library Changes") to this application with any changes to the following questions.

(a) How are you planning to meet this standard on Library Resources? Briefly describe the types of materials and titles that you will make available to your students and how they will access them. Will there be provision for bibliographic instruction and/or library orientation?

6. Student Services. COMAR 13B.02.01.18 concerns student services and activities. These shall realistically reflect the stated objectives, purposes, and philosophy of the out-of-State institution. Further, an out-of-State institution shall ensure that all students have access to a well developed program of counseling, testing, advisement, orientation, financial aid, career development, and placement. The institution may determine the specific organization of services, as well as the resources and staffing provided, as long as provision for these services are made. Student activities that complement the

instructional program are particularly encouraged. COMAR Section .18 also requires that the out-of-State institutions keep complete and accurate records of admission, enrollment, grades, scholarships, transfer of credits, transcripts, graduates, and other essentials in accordance with standard practice. This includes the physical security and confidentiality of such records. The Section requires as well, a published statement of student rights, privileges, and responsibilities and the school's adherence to its student grievance procedures.

INSTRUCTIONS: Has any previously reported Student Services information changed since your last approval at this location? ☐ Yes ☒ No

If yes, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-6: Student Services") to this application with any changes to the following questions.

(a) How do you plan to implement the requirements for Student Services cited above?

(b) Regarding student records describe the security measures the institution takes to ensure the confidentiality, physical, and electronic security of your record-keeping system.

(c) Does the institution have a published statement of rights, privileges, and responsibilities of students?

☐ Yes ☐ No How will it make this available to its students at the proposed instructional site? _____

If this statement is in the Catalog you submitted with the application, please indicate the page number: _____

If not in the Catalog you submitted, please provide us with a copy of the statement.

(d) Does the institution have a published student grievance procedure? ☐ Yes ☐ No If this procedure is in the Catalog you submitted with the application, please indicate the page number _____. If not in the Catalog you submitted, please provide us with a copy of the grievance procedure.

7. Facilities. (See COMAR 13B.02.01.19).

INSTRUCTIONS: Has any previously reported Student Services information changed since your last approval at this location? ☐ Yes ☒ No

If yes to either question, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-7: Facilities") to this application with any changes to the following questions.

(a) Has a specific facility been inspected and approved for use as a classroom/laboratory space and been found in compliance with local and State ordinance pertaining to fire and safety? ☐ Yes ☐ No

(1) If yes, please provide a copy of the Certificate of Compliance.

(2) If no, the Certificate of Compliance must be submitted at least 30 days prior to the start of classes.

(b) Describe any special instructional facilities and equipment (computers, audio-visual equipment, etc.) that will be used and available to students in this location.

(c) Describe what provisions are being made for periodic repair and maintenance of buildings and grounds. What measures are being taken for campus security and fire protection? If dangerous or toxic materials are being handled, what provisions are being made for safe storage, handling and disposal?

(d) Describe the office (and conference) space available to full and part-time faculty and administrators.

8. Distance Education. "Distance education" means course work for academic credit delivered by telecommunicated instruction to a physical space specifically reserved for the purpose of receiving the instruction, for example, a teleclassroom, and requires the payment of tuition or fees for the instruction. "Distance education" does not include telecommunicated instruction at the student's initiation via an individual personal computer. COMAR 13B.02.01.03(8). An institution operating in Maryland and delivering instruction in Maryland by distance education shall provide evidence to the Secretary of compliance with the standards of good practice found in COMAR 13B.02.01.21.

INSTRUCTIONS. Is the institution providing distance education as defined above? ☒ Yes ☐ No
If yes, please contact the staff at the Maryland Higher Education Commission for a copy of the Standards of Good Practice and provide evidence of compliance as an attachment (labeled "A-8: Distance Education") to this application

A-1: Current Programs – Florida Tech Aberdeen at APG, Maryland

Program Title	Degree	Mode of Instruction	Total Credit Hours	Offered on Main Campus Yes/No
Business Administration	M.B.A.	Classroom	36	Yes
Acquisition & Contract Management	M.S.	Classroom	33	Yes
Human Resource Management	M.S.	Classroom	33	Yes
Management	M.S.	Classroom	33	Yes
Management – AoC in Acquisition & Contract Management	M.S.	Classroom	33	Yes
Management – AoC in Information Systems	M.S.	Classroom	33	Yes
Management – AoC in Logistics Management	M.S.	Classroom	33	Yes
Project Management	M.S.	Classroom	33	Yes
Project Management – AoC in Information Systems	M.S.	Classroom	33	Yes
Project Management – AoC in Operations Research	M.S.	Classroom	33	Yes

University System of Maryland at Southern Maryland
(USMSM)

OOS RENEWAL

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Southern MD Higher Education Center	21803 A Three Notch Road
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California, MD 20619	(closed February 28, 2018)

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

(c) Is a Maryland employer sponsoring/supporting the application for the program(s) to be offered at this location?

☐ Yes ☐ No

If yes, please attach a letter of support from the employer addressed to the Assistant Secretary, Planning and Academic Affairs. The letter should outline the employer's reasons for selecting the institution and its programs and state the benefits to the employees who participate in the program

3. Administrative Staff. The out-of-State institution shall provide for an on-site administrative staff responsible for overall administrative operation of educational activities including counseling, advising, testing orientation, financial aid services, and maintenance of academic records. In addition to being responsible for the administration of the policies and procedures of the parent institution, the designated administrators are responsible for meeting the expectations set forth in this chapter [of the Regulatory Standards of the State of Maryland for Out-of-State Institutions]. The duties and size of the staff shall be adequate for the size of the educational activities offered. COMAR 13B.02.01.15

INSTRUCTIONS: Has any previously reported Administrative Staff information changed since your last approval at this location? ☒ Yes ☐ No

If yes, please enter the requested information in the spaces provided below, or create an attachment labeled (labeled "A-3: Administrative Staff Changes") to this application with any changes to the following questions:

(a) How are you planning to meet the above standard on Administrative Staff?

(b) Who will be assigned to carry-out each of these duties? Please include a curriculum vitae/resume for each administrator.

4. Faculty

INSTRUCTIONS: Has any previously reported Faculty information changed since your last approval at this location? ☒ Yes ☐ No

If yes, please enter the requested information in the spaces provided below, or create an attachment labeled (labeled "A-4: Faculty Changes") with any changes to the following questions:

(a) List all faculty that are to teach in the first year (or cycle) of the programs at this location. For each faculty member provide the following information: COMAR 13B.02.01.08(4)(m)

- (1) the course(s) the faculty might soon teach;
- (2) the degrees the individual holds
- (3) the degrees areas of specialization; and
- (4) whether or not the faculty member is full-time or part-time (adjunct) at your parent institution

(b) Please include a curriculum vitae/resume for each potential faculty member. For those faculty who are yet to be hired include a job description and minimal qualifications.

5. Library Resources. Out-of-State Institutions offering programs or courses, or both, in Maryland, shall provide adequate and appropriate library resources within State boundaries and within reasonable distance of the instructional site. Usage statistics shall be kept to determine to what extent these resources are available and accessible. COMAR 13B.02.01.17A

INSTRUCTIONS: Has any previously reported library information changed since your last approval at this location? ☐ Yes ☒ No

If yes, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-5: Library Changes") to this application with any changes to the following questions.

(a) How are you planning to meet this standard on Library Resources? Briefly describe the types of materials and titles that you will make available to your students and how they will access them. Will there be provision for bibliographic instruction and/or library orientation?

6. Student Services. COMAR 13B.02.01.18 concerns student services and activities. These shall realistically reflect the stated objectives, purposes, and philosophy of the out-of-State institution. Further, an out-of-State institution shall ensure that all students have access to a well developed program of counseling, testing, advisement, orientation, financial aid, career development, and placement. The institution may determine the specific organization of services, as well as the resources and staffing provided, as long as provision for these services are made. Student activities that complement the

instructional program are particularly encouraged. COMAR Section .18 also requires that the out-of-State institutions keep complete and accurate records of admission, enrollment, grades, scholarships, transfer of credits, transcripts, graduates, and other essentials in accordance with standard practice. This includes the physical security and confidentiality of such records. The Section requires as well, a published statement of student rights, privileges, and responsibilities and the school's adherence to its student grievance procedures.

INSTRUCTIONS: Has any previously reported Student Services information changed since your last approval at this location? ☐ Yes ☒ No

If yes, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-6: Student Services") to this application with any changes to the following questions.

(a) How do you plan to implement the requirements for Student Services cited above?

(b) Regarding student records describe the security measures the institution takes to ensure the confidentiality, physical, and electronic security of your record-keeping system.

(c) Does the institution have a published statement of rights, privileges, and responsibilities of students?

☐ Yes ☐ No How will it make this available to its students at the proposed instructional site? _____

If this statement is in the Catalog you submitted with the application, please indicate the page number: _____

If not in the Catalog you submitted, please provide us with a copy of the statement.

(d) Does the institution have a published student grievance procedure? ☐ Yes ☐ No If this procedure is in the Catalog you submitted with the application, please indicate the page number _____. If not in the Catalog you submitted, please provide us with a copy of the grievance procedure.

7. Facilities. (See COMAR 13B.02.01.19).

INSTRUCTIONS: Has any previously reported Student Services information changed since your last approval at this location? ☐ Yes ☐ No

If yes to either question, please enter the requested information in the spaces provided below, or create an attachment (labeled "A-7: Facilities") to this application with any changes to the following questions.

(a) Has a specific facility been inspected and approved for use as a classroom/laboratory space and been found in compliance with local and State ordinance pertaining to fire and safety? ☒ Yes ☐ No

(1) If yes, please provide a copy of the Certificate of Compliance.

(2) If no, the Certificate of Compliance must be submitted at least 30 days prior to the start of classes.

(b) Describe any special instructional facilities and equipment (computers, audio-visual equipment, etc.) that will be used and available to students in this location.

(c) Describe what provisions are being made for periodic repair and maintenance of buildings and grounds. What measures are being taken for campus security and fire protection? If dangerous or toxic materials are being handled, what provisions are being made for safe storage, handling and disposal?

(d) Describe the office (and conference) space available to full and part-time faculty and administrators.

8. Distance Education. "Distance education" means course work for academic credit delivered by telecommunicated instruction to a physical space specifically reserved for the purpose of receiving the instruction, for example, a teleclassroom, and requires the payment of tuition or fees for the instruction. "Distance education" does not include telecommunicated instruction at the student's initiation via an individual personal computer. COMAR 13B.02.01.03(8). An institution operating in Maryland and delivering instruction in Maryland by distance education shall provide evidence to the Secretary of compliance with the standards of good practice found in COMAR 13B.02.01.21.

INSTRUCTIONS. Is the institution providing distance education as defined above? ☒ Yes ☐ No
If yes, please contact the staff at the Maryland Higher Education Commission for a copy of the Standards of Good Practice and provide evidence of compliance as an attachment (labeled "A-8: Distance Education") to this application

A-1: Current Programs – Florida Tech Southern Maryland at University System of Maryland at Southern Maryland (USMSM), formerly Southern Maryland Higher Education Center (SMHEC)

Program Title	Degree	Mode of Instruction	Total Credit Hours	Offered on Main Campus Yes/No
Business Administration	D.B.A.	Classroom/ Distance Ed.	42	Yes
Logistics Management	M.S.	Classroom/ Distance Ed.	33	Yes
Logistics Management	B.S.	Classroom/ Distance Ed.	121	Yes
Management – AoC in Logistics Management	M.S.	Classroom/ Distance Ed.	33	Yes
Project Management	M.S.	Classroom/ Distance Ed.	33	Yes
Project Management – AoC in Information Systems	M.S.	Classroom/ Distance Ed.	33	Yes
Project Management – AoC in Operations Research	M.S.	Classroom/ Distance Ed.	33	Yes
Technology Management	M.S.	Classroom/ Distance Ed.	30	Yes

(a) List of new programs

Program Title	Degree/ Award	Mode of Instruction	Total Credit Hours	Offered on Main Campus	Year MHEC Program Approval
Acquisition & Contract Management	M.S.	Classroom/ Distance Ed.	33	Yes	1990 est
Acquisition & Contract Management	P.B.C.	Classroom/ Distance Ed.	15	Yes	2015
Aerospace Engineering	M.S.	Classroom/ Distance Ed.	30	Yes	1993
Business Administration	M.B.A.	Classroom/ Distance Ed.	36	Yes	1980 est
Computer Information Systems	M.S.	Classroom/ Distance Ed.	30	Yes	1993
Computer Science	M.S.	Classroom/ Distance Ed.	30	Yes	1982*
Electrical Engineering	M.S.	Classroom/ Distance Ed.	30	Yes	1972*
Engineering Management	M.S.	Classroom/ Distance Ed.	30	Yes	1990 est
Flight Test Engineering	M.S.	Classroom/ Distance Ed./ Lab	30	Yes	2016
Flight Test Engineering	P.B.C.	Classroom/ Distance Ed./ Lab	12	Yes	2016
Management	M.S.	Classroom/ Distance Ed.	33	Yes	1985 est
Management – AoC in Acquisition & Contract Management	M.S.	Classroom/ Distance Ed.	33	Yes	1988 est
Management – AoC in Information Systems	M.S.	Classroom/ Distance Ed.	33	Yes	1988 est

*Maryland State Board for Higher Education (SBHE)

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

(b) University Catalog is available online at <https://catalog.fit.edu/>

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

(a) List of new programs

Program Title	Degree	Mode of Instruction	Total Credit Hours	Offered on Main Campus
Information Technology, with Specializations in Cybersecurity and Database Administration	M.S.	Classroom/ Distance Ed.	33	Yes

Accreditation

[Back to Results](#)

Florida Institute of Technology

As of 7/23/2020

Former Name: Brevard Engineering College (1964 - 1965)

The information on this page describes the accreditation relationship between this institution and the Southern Association of Colleges and Schools Commission on Colleges. General information about the Commission and the accreditation process is provided at the end of this document. In addition, links to definitions are provided for many of the terms used.

General Information

+ CEO Name

Dr. T. Dwayne McCay

+ Address

150 West University Boulevard
Melbourne, FL 32901-6975

+ Country

United States

+ Institutional Phone

(321) 674-8000

+ Approved to Offer

Associate's Degree
Baccalaureate Degree
Master's Degree
Education Specialist Degree
Doctoral Degree

+ [View Available Programs](#)

+ [View Student Achievement Data](#)

Accreditation Information

- + **Status**
Accredited
- + **Public Sanctions**
- + **Candidacy Date**
- + **Accreditation Granted**
1964
- + **Reaffirmation**
2015
- + **Next Reaffirmation**
2025
- + **Next Fifth-Year Review**
2021
- + **Degree Level**
VI
- + **Control**
Private, Not-For-Profit

SACSCOC Staff Member

Mary Kirk

(404) 994-6545

[Email](#)

In-Progress Reviews

2021 Fifth-Year Interim Report

Off-campus Instructional Sites (Additional Locations)

Types

- **Approved $\geq 50\%$:** Site is approved to offer any portion of a program. Additional programs may be offered with no further site notification or approval. Only sites offering 50% or more of a program require approval.
- **Approved Branch $\geq 50\%$:** Site is approved as a branch campus to offer any portion of a program. Additional programs may be offered with no further site notification or approval.
- **Approved Cert $\geq 50\%$:** Site is approved to offer any portion of a certificate program only. Additional certificate programs, or up to 50% of non-certificate programs, may be offered with no further site notification or approval.
- **Notified 25-49%:** Less than 50% of a program may be offered at the site. Less than 50% of additional programs may be offered with no further site notification.
- Sites offering less than 25% of a program do not require notification or approval.

Status

- **Open:** Instruction may be offered at the site consistent with the site type defined above.
- **Closed:** Closed sites are not shown. A site is closed when (1) the institution has stopped admitting students to the site and (2) SACSCOC has approved the site teach-out plan. Therefore, instruction may continue at a site under the teach-out plan after the site is closed.

+ 7th SFG Liberty Chapel

Soto Cano Loop
Elgin Air Force Base, FL 32542-6838
United States
Type: Approved $\geq 50\%$
Status: Open

+ 7th Support

4385 El Salvador Way, Room 162
Eglin Air Force Base, FL 32542
United States

Type: Approved >= 50%

Status: Open

+ **Aberdeen Graduate Center**

Building 4305, 6488 Rodman Road

Aberdeen Proving Grd, MD 21005

United States

Type: Approved >= 50%

Status: Open

+ **Applied Behavior Consultants**

4540 Harlin Drive

Sacramento, CA 95826

United States

Type: Notified 25-49%

Status: Open

+ **Brevard County Fire and Rescue Office**

1040 South Florida Avenue

Rockledge, FL 32955

United States

Type: Approved >= 50%

Status: Open

+ **Brevard County Sheriff's Office**

575 North Courtenay Parkway

Merritt Island, FL 32953

United States

Type: Approved >= 50%

Status: Open

+ **City of Palm Bay**

120 Malabar Road, S.E.

Palm Bay, FL 32907

United States

Type: Approved >= 50%

Status: Open

+ **Debus Conference Facility**

Kennedy Space Center Visitor Complex 405 FL-405

Titusville, FL 32780

United States

Type: Approved >= 50%

Status: Open

+ **Eglin Education Center**

96 FSS/FSDE 502 West D Avenue

Eglin Air Force Base, FL 32542

United States

Type: Approved >= 50%

Status: Open

+ Florida Tech Spaceport

Space Coast Airport Business Center 6855 Tico Road

Titusville, FL 32780

United States

Type: Approved >= 50%

Status: Open

+ Florida Tech-New Hampshire

20 University Drive

Nashua, NH 03063

United States

Type: Approved >= 50%

Status: Open

+ Fort Lee Graduate Center

Building 12500 2401 Quarters Road

Fort Lee, VA 23801-1705

United States

Type: Approved >= 50%

Status: Open

+ Hampton Roads Graduate Center

1500 Madison Avenue Room 206

Fort Eustis, VA 23604-0323

United States

Type: Approved >= 50%

Status: Open

+ Huntsville Education Center

Building 3495 Patton Road Room 105A

Redstone Arsenal, AL 35898

United States

Type: Approved >= 50%

Status: Open

+ Melbourne Police Department

701 S. Babcock Street

Melbourne, FL 32901

United States

Type: Approved >= 50%

Status: Open

+ National Capital Region Graduate Center

3089 Roan Street Marine Corps Base

Quantico, VA 22134

United States

Type: Approved >= 50%

Status: Open

+ **New England Center for Children-Abu Dhabi**

Building No. 31, Zone 23 Mohammed Bin Zayed City

Abu Dhabi

United Arab Emirates

Type: Notified 25-49%

Status: Open

+ **Newport News Shipbuilding**

4101 Washington Avenue Building 901

Newport News, VA 23607

United States

Type: Approved >= 50%

Status: Open

+ **Northrop Grumman Corporation**

3990 South Babcock Street

Melbourne, FL 32901

United States

Type: Approved >= 50%

Status: Open

+ **Orlando Graduate Center-Baldwin Park Location**

2420 Lakemont Avenue Suite 190

Orlando, FL 32814

United States

Type: Approved >= 50%

Status: Open

+ **Orlando Graduate Site-Lockheed-Martin Location**

5600 Sand Lake Road

Orlando, FL 32819

United States

Type: Approved >= 50%

Status: Open

+ **Redstone Site-Huntsville Location**

Building 7 6767 Old Madison Pike

Huntsville, AL 35806

United States

Type: Approved >= 50%

Status: Open

+ **Southern Maryland Higher Education Center**

44219 Airport Drive

California, MD 20619

United States

Type: Approved >= 50%
Status: Open

+ **Spaceport Graduate Center**

6855 Tico Road Suite 12
Titusville, FL 32780
United States
Type: Approved >= 50%
Status: Open

+ **The City of Titusville Police Department**

1100 John Glenn Boulevard
Titusville, FL 32780
United States
Type: Notified 25-49%
Status: Open

+ **UTP Escuela de Avation y Logistica (School of Avation and Logistics)**

Howard
Panama City
Panama
Type: Notified 25-49%
Status: Open

+ **Valencia College-Lake Nona Campus**

12350 Narcoossee Road
Orlando, FL 32832
United States
Type: Approved >= 50%
Status: Open

ABOUT SACSCOC AND ACCREDITATION

The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) is the regional commission responsible for accrediting degree-granting institutions in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and some institutions in Latin America and other international sites approved by the SACSCOC Board of Trustees. The SACSCOC Board of Trustees is the representative body of the member institutions also known as the College Delegate Assembly. To gain or maintain accreditation, an institution must comply with SACSCOC policies, procedures, and with all standards contained in the *Principles of Accreditation: Foundations for Quality Enhancement* in the professional judgment of peer reviewers. SACSCOC's institutional accreditation includes all degree levels regardless of location or mode of instruction.

Regional accreditation agencies are recognized by the U.S. Department of Education to accredit degree-granting colleges and universities. There are six regions of the United States which regional agencies oversee. Regional accreditation validates the quality of an institution as a whole and evaluates multiple aspects of an institution, including its academic offerings, governance and administration, mission, finances, and resources. Institutions of higher education in the United States may also seek accreditation through national or specialized accreditation agencies. National accreditation associations, like regional accreditors, accredit the institution as a whole. Specialized accreditation agencies accredit programs, departments or schools within a college or university.

Components of the Review Process

The SACSCOC Board of Trustees conducts several types of institutional reviews: (1) Candidate Committee reviews of applicant institutions seeking candidacy, (2) Accreditation Committee reviews of candidate institutions seeking initial membership, (3) Reaffirmation Committee reviews of member institutions seeking continued accreditation following a comprehensive review, (4) Special Committee reviews of member institutions seeking continued accreditation following evaluation of institutional circumstances that are accreditation related, and (5) Substantive Change Committee reviews of member institutions seeking approval and continued accreditation following the review of a change of a significant modification or expansion to the institution's nature and scope. Each of the above type of reviews has its own evaluation documents and peer review procedures and can be found on the SACSCOC website at www.sacscoc.org.

The Committees on Compliance and Reports (C&R), standing committees of the SACSCOC Board of Trustees, review reports prepared by evaluation committees and the institutional responses to those reports. A C&R Committee's recommendation regarding an institution's accreditation-related matters is forwarded to the Executive Council for review. The Executive Council recommends action to the SACSCOC Board of Trustees, which makes the final decision on reaffirmation and any monitoring activities that it may require of an institution. The SACSCOC Board of Trustees convenes twice a year.

Complaints Against SACSCOC Accredited Institutions

The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) recognizes the value of information provided by students, employees, and others in determining whether an institution's performance is consistent with SACSCOC standards for obtaining or maintaining accreditation. The Commission's interest also is in ensuring that member institutions maintain appropriate grievance procedures and standards of procedural fairness and that the procedures are applied appropriately and consistently. The procedures for the review of complaints involving member institutions enable SACSCOC to address possible violations of its *Principles of Accreditation*, its Core Requirements and Standards, SACSCOC policies or procedures, as well as to address possible violations of an institution's own policies and procedures, if related to the *Principles*.


Since SACSCOC's complaint procedures are for the purpose of addressing any significant non-compliance with SACSCOC *Principles of Accreditation*, policies, or procedures, **the procedures are not intended to be used to involve SACSCOC in disputes between individuals and member institutions, or cause SACSCOC to interpose itself as a reviewing authority in individual matters of admission, grades, granting or transferability of credits, application of academic policies, fees or**

other financial matters, disciplinary matters or other contractual rights and obligations. Nor does SACSCOC seek redress on an individual's behalf. Under no circumstances does SACSCOC respond to, or take action on, any complaint or any allegation that contains defamatory statements. Further, SACSCOC will not serve as a grievance panel when the outcome of institutional grievance or appeal processes is unsatisfactory to the complainant.

SACSCOC expects individuals to attempt to resolve the issue through all means available to the complainant, including following the institution's own published grievance procedures, before submitting a complaint to SACSCOC. Therefore, SACSCOC is under no obligation to consider additional information submitted by the complainant subsequent to the receipt of the formal complaint. SACSCOC's usual practice is not to consider a complaint that is currently in administrative proceedings, including institutional proceedings, or in litigation. However, if there is substantial, credible evidence that indicates systemic problems with an accredited institution, SACSCOC may, at its discretion, choose to proceed with the review.

In order for review by SACSCOC personnel, a formal complaint must be submitted **in writing** using the [SACSCOC "Complaints Against Institutions: Information Sheet and Form,"](#) **signed**, and **two copies** mailed to: **President, Southern Association of Colleges and Schools Commission on Colleges, 1866 Southern Lane, Decatur, Georgia, 30033-4097.** SACSCOC will not review oral or anonymous complaints, and it will not consider complaints sent electronically or through facsimile transmission. In addition, SACSCOC will not act on complaints submitted on behalf of another individual or complaints forwarded to SACSCOC from another entity.

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 1866 Southern Lane,
Decatur, GA 30033

 404.679.4500

 [Email Us](#)



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Commissioner of Education

January 16, 2020

Dr. T. Dwayne McCay
President
Florida Institute of Technology
150 West University Blvd.
Melbourne, FL 32901-6988

Dear Dr. T. Dwayne McCay,

Florida Institute of Technology is a private, not-for profit college that is located and chartered in the State of Florida. Pursuant to section 1005.06(c), Florida Statutes, "[a]ny institution that is under the jurisdiction of the Florida Department of Education, eligible to participate in the William L. Boyd, IV, Effective Access to Student Education Program and that is a nonprofit independent college or university located and charter in this state and accredited by the Commission on Colleges of the Southern Association of College and Schools to grant baccalaureate degrees" is not required to obtain licensure.

During the 2020 calendar year, Florida Institute of Technology is included among the independent colleges and universities that fall under this law in Florida. These institutions are exempt from Florida licensure.

Sincerely,

Rod Duckworth
Executive Director

c: tdmccay@fit.edu
oir@fit.edu

Course descriptions from the College's catalog

A-1: New Location of Current Programs – University System of Maryland at Southern Maryland (USMSM), formerly Southern Maryland Higher Education Center (SMHEC)

Background

All of the following programs were approved at the Patuxent River, MD location for 2015-2020. Unfortunately, the Patuxent River, MD location was closed during this time, and program delivery continued at a regional higher education center located 7 miles north. Here is a short explanation of how this came about, and the necessary actions that followed.

Starting in Fall 2016, NAS Patuxent River abruptly discontinued use of classrooms by outside institutions at the teaching location on the naval base where instruction had taken place since the Florida Tech site was created in the 1970s. Participating schools were directed to seek alternative classroom space to continue operations. Florida Tech chose classroom space at the Southern Maryland Higher Education Center (SMHEC), as it was then called, where a subset of programs was also approved for 2015-2020. Florida Tech administrative staff served both teaching locations out of an office across the road from the base gate. When the office lease ended in February 2018, the office was closed and staff and operations permanently moved to SMHEC. Florida Tech notified MHEC of the change, and MHEC granted Florida Tech conditional approval to offer all previously approved Patuxent River programs at SMHEC, now the sole teaching location.

Following action by the 2018 Maryland Legislature, SMHEC was made a University System of Maryland Regional Higher Education Center on March 1, 2019 and rebranded University System of Maryland at Southern Maryland (USMSM). All the SMHEC University Partners, including Florida Tech, were retained under USMSM.¹

As USMSM Regional Higher Education Center is a different location than approved by MHEC for 2015-2020 for these programs, they are required to be submitted as new programs. Note again that all 13 programs have been previously approved, one as far back as 1972. Note also that USMSM serves the same student body as the closed Patuxent River location. Section A-2 Education Need that follows includes a summary of enrollments and graduates from these programs over the approved period of Academic Year (AY) 2016 through AY 2020, and total graduates since the start of each program.

¹ Southern Maryland University System of Maryland Partnership Act of 2018 (HB 1143/SB 903). This bill repeals the Southern Maryland Higher Education Center (SMHEC) from statute. The bill also specifies that SMHEC, as enacted in statute, ceases to exist on the effective date of the bill and that its operations, facilities, and resources must become part of a regional higher education center (RHEC) established by the Board of Regents of the University System of Maryland (USM). The bill takes effect March 1, 2019. Based on the long history of collaboration that independent colleges and universities have with the Southern Maryland Higher Education Center and to state, included in the bill is the commitment from USM to continue to allow non-USM institutions to offer programs at the Center.

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 off-campus Education Centers are particularly interested in serving the needs of the professional adult learner, and often those connected with a military activity. The University System of Maryland at Southern Maryland (USMSM) student population can include active duty military, reservists, veterans, civil servants, and government service contractors primarily employed by the U.S. Navy at Naval Air Station (NAS) Patuxent River, Naval Support Facility (NSF) Indian Head, and Naval Surface Warfare Center (NSWC), Dahlgren Division, along with students from the broader community. The proposed new programs are in response to the long-standing local demand for technical professionals in the fields of Aerospace, Electrical, and Flight Test Engineering; Computer Science and Information Systems; and several Management Specialties including Acquisition and Contract Management. These programs serve a student population that seeks traditional, face-to-face classroom instruction. Program descriptions in the University Catalog provide explanations of the student population to be served by each program along with the opportunities for academic and professional achievement. See also A-1a immediately following for program descriptions, A-1b: Program Curricula, and A-2: Educational Need for each proposed new program.

A-1a: Program Descriptions

Master of Science in Acquisition & Contracts Management

The Master of Science in Acquisition and Contracts Management is designed for adult working professionals in the public and private sectors of acquisition and contract management. The curriculum provides coverage of federal procurement practices, current issues in contracting and contract administration, legal and financial aspects of government contracting and policy issues associated with acquisition and contract management. Individuals without current experience in acquisition and contract management may be accepted into this program; however, all program prerequisite courses must be fulfilled. The goal of the program is to prepare individuals for advanced leadership positions in the private, public and military sectors with specific skills and competencies in acquisition and contract administration. Graduates with a master's degree in acquisition and contract management fulfill a variety of positions including contract/purchasing officer, project manager, and analyst. As an Acquisition Command, NAVAIR Contracts departments depend heavily on this curriculum, which matches well with Defense Acquisition University (DAU) Contracting Certification curriculum.

GCP Acquisition & Contracts Management

The certificate is awarded to students who complete the 15-credit-hour program consisting of essentials of contracting management including contract changes, subcontracts, cost principles, and contract negotiations, with a minimum 3.0 cumulative GPA.

Master of Science in Aerospace Engineering

The Master of Science in Aerospace Engineering seeks to expand student knowledge, skills, ability and competency in the field of aerospace and aeronautical engineering. The master of science degree can be earned in one of four major areas: aerodynamics and fluid dynamics, aerospace structures and materials, combustion and propulsion, and flight mechanics and controls. Employers seek out graduates with a master's degree in aerospace engineering from Florida Tech. Those choosing to enter the workforce after graduation can expect to find an abundance of job opportunities in design and development, test and evaluation, and research at activities aboard Naval Air Station Patuxent River, MD and with leading aerospace firms such as Lockheed Martin, Northrop Grumman, Boeing, Raytheon, KBR Wyle, Harris Corp., GE, Pratt and Whitney, and others.

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 master's 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.

Master of Science in Computer Information Systems

The master of science in computer information systems at Florida Tech emphasizes problem solving within the computing field, paying special attention to software and services construction, database integration, design and maintenance of data-driven systems and knowledge of emerging technologies on a wide variety of platforms. This can include mobile and enterprise systems, wireless and system administration. Graduates with a computer information systems degree develop in-depth technical expertise in areas such as computer programming, database management, system design, implementation and maintenance. The program also prepares students for many other segments of the industry including: systems administration, network administration, enterprise management and modeling, computer programming, data driven real-time systems, web-based and mobile computing applications.

Master of Science in Computer Science

A master's degree in computer science provides students with the technical expertise needed to enter top jobs such as information technology, database administration, systems engineering, software development, computer security, software and network architecture, and systems analysis. Graduates develop algorithmic thinking and the ability to design, develop and test software and information systems in order to create new methods of human-computer interaction, design intelligent systems or program high-powered software applications. Graduates with a master's degree in computer science find employment opportunities in nearly every market segment as technology expands into every aspect of our lives: work, home, social and recreation. Employers that have recruited Florida Tech students for internships and careers include the U.S. Navy, NASA, IBM, Microsoft, Electronic Arts, Google, Zynga and Texas Instruments.

Master of Science in Electrical Engineering

The master's in electrical engineering program prepares graduates to meet the technological challenges of the 21st century. Specialization in the master's in electrical engineering degree is offered in: Wireless Communication, Photonics, Spacecraft Systems, Systems and Information Processing, and Wireless Systems and Technology. Electrical and computer engineering graduates design, develop, test and supervise the manufacturing of electrical equipment such as motors, radar and navigation systems, communications systems and power equipment. Graduates with a master's in electrical engineering work primarily in research and development, engineering services, manufacturing, federal government, and in a variety of industries including electronics, communications, energy, railway and automotive.

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 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 Management

The goal of the Master of Science in Management is to prepare individuals for advanced leadership positions in the private, public and military sectors with specific skills and competencies in management and identified concentration areas. In a highly competitive workforce, ambitious business professionals must develop the type of skills that are relevant to diverse organizations. The master's in management combines advanced business skills in

accounting, organizational behavior, communications, planning and development, leadership, critical thinking, and human resources to create graduates who are ready to lead in senior-level positions. During their final year of study, students in the master's in management degree program obtain practical experience working with organizations in need of advanced management expertise. This project takes the place of a traditional research thesis or a comprehensive program examination. Working on complex challenges facing an operating business, students consult in teams and apply the research skills they have acquired and the curriculum they have learned to formulate solutions that address the organization's needs.

Master of Science in Management, AOC in Acquisition & Contracts Management

The Master of Science in Management with a Concentration in Acquisition and Contracts Management degree program is designed for professionals from diverse backgrounds seeking a degree that prepares them with the strategic decision-making skills necessary for management positions in any organization. The management master's degree with a concentration in acquisition and contract management focuses on procurement, contract negotiations, cost principles, and subcontract formulation, among other topics related to acquisition and contract management as well as the core competencies of the master's degree in management. Career paths for individuals who earn a master's degree in management, especially with a concentration in acquisition and contract management, vary widely as the program is suited for any individual who is advancing their career in the private, public, and military sector.

Master of Science in Management, AOC in Information Systems

The Master of Science in Management with a concentration in information systems is designed for professionals from diverse backgrounds seeking a degree that prepares them with the strategic decision-making skills necessary for management positions in any organization. The degree focuses on database and computers systems and other topics related to information systems, as well as the core competencies of the master's degree in management. Career paths are varied for individuals who earn a master's in management, especially those with a concentration in information systems, as the program is suited to everyone advancing their career in the private, public, or military sectors.

A-1b: Program Curricula

Taken from 2020-2021 University Catalog, see

https://catalog.fit.edu/preview_program.php?catoid=9&poid=3219&returnto=371

Acquisition and Contract Management, M.S.

Major Code: 8399

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Online, Classroom, Off-site

Admission Materials: Résumé, transcripts

Location(s): Aberdeen, MD; Fort Lee, VA; Hampton Roads, VA; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Spaceport, FL; Virtual Site

Degree Requirements

The degree of Master of Science in Acquisition and Contract Management is conferred upon students who have successfully completed 33 credit hours of graduate coursework plus other course requirements as listed on the student's approved graduate program plan. Students without an adequate undergraduate background will be required to complete all or part of the program prerequisites. Students may choose elective courses from those listed below. Students with undergraduate credits for courses that they believe are equivalent to the program prerequisites should consult with their advisor concerning waiver of those courses.

Curriculum

Candidates for the degree must successfully complete the following curriculum.

Program Prerequisite

Prerequisite is noncredit for this program.

MTH 1701 College Algebra

Note: Computer literacy is required as a prerequisite. It can be demonstrated by the applicant's undergraduate coursework, passing a proficiency examination offered by the extended studies department or by completing a suitable computer course.

Core Courses

MGT 5000 Financial Accounting

MGT 5211 Procurement and Contract Management

MGT 5212 Advanced Procurement and Contract Management

MGT 5213 Contract Changes, Terminations and Disputes

MGT 5214 Cost Principles, Effectiveness and Control

MGT 5217 Contract and Subcontract Formulation

MGT 5218 Contract Negotiations and Incentive Contracts

MGT 5220 Contract Management Research Seminar (serves as the capstone course for the program)

MGT 5231 Government Contract Law

Electives Credit Hours: 6

Note: Electives may be taken with the approval of both the faculty advisor and the program head from other graduate-level offerings in the extended studies department, or other colleges or academic units.

Total Credits Required: 30

Required Courses and Course Descriptions

MGT 5000 Financial Accounting

Credit Hours: 3

Studies accounting concepts, the accounting model, measurement processes, financial statements, financial analysis, the accounting cycle, monetary and fixed assets, inventory, current and long-term liabilities, and equity structures of partnerships, proprietorships and corporations.

MGT 5211 Procurement and Contract Management

Credit Hours: 3

Overviews in depth the federal acquisition process and introduces the basic concepts, policies and procedures incident to government contracting through the FAR and supplementing directives.

MGT 5212 Advanced Procurement and Contract Management

Credit Hours: 3

Covers principles, policies, concepts and procedures in management of contracts and subcontracts. Includes rules of interpretation, subcontracting terms and conditions, in-depth examination of significant contract clauses, patent/data provisions, risk allocation and assumption, impossibility of performance, product liability, warranties and claims. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5213 Contract Changes, Terminations and Disputes

Credit Hours: 3

Uses case studies and lectures to examine in depth the post-award management problems associated with contract administration. Covers contract changes, terminations, disputes and other issues. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5214 Cost Principles, Effectiveness and Control

Credit Hours: 3

Includes financial and accounting overviews of government acquisition policy and procedures. Requires completion of foundation requirements. Recommended: Background knowledge equivalent to MGT 5001 Managerial Accounting and MGT 5211 Procurement and Contract Management.

MGT 5217 Contract and Subcontract Formulation

Credit Hours: 3

Studies in depth the pre-award phase of the federal acquisition process. Uses class discussions and case studies to examine the management problems from the perspective of the contracting office, requiring activity, courts, Congress and the contractors. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

<p>MGT 5218 Contract Negotiations and Incentive Contracts Credit Hours: 3 <i>Explores, analyzes and discusses negotiation concepts and techniques, and places them into practice using mock negotiations. Examines all types of contracts. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.</i></p>
<p>MGT 5220 Contract Management Research Seminar Credit Hours: 3 <i>Advanced study and research of topical government contract management issues. Involves a significant research paper or challenging capstone project designed to demonstrate mastery over the complete curriculum. Requirement(s): Must be taken during the last 12 credit hours of the program</i></p>
<p>MGT 5231 Government Contract Law Credit Hours: 3 <i>Focuses on the method rather than the material. Uses the case method of study and basic source material to cover all facets of procurement law. Emphasizes legal methods, logic and the developmental concepts of procurement law.</i></p>

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3405&returnto=371

Acquisition and Contract Management Graduate Certificate

Major Code: 8271

Degree Awarded: Graduate Certificate

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Hybrid

Admission Materials: Transcripts

Location(s): Fort Lee, VA; Hampton Roads, VA; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Virtual Site

Curriculum

The certificate is awarded to students who complete the 15-credit-hour program with a minimum 3.0 cumulative GPA.

Required Courses

MGT 5211 Procurement and Contract Management

MGT 5213 Contract Changes, Terminations and Disputes

MGT 5214 Cost Principles, Effectiveness and Control

MGT 5217 Contract and Subcontract Formulation

MGT 5218 Contract Negotiations and Incentive Contracts

Total Credits Required: 15

Required Courses and Course Descriptions

MGT 5211 Procurement and Contract Management
Credit Hours: 3
<i>Overviews in depth the federal acquisition process and introduces the basic concepts, policies and procedures incident to government contracting through the FAR and supplementing directives.</i>
MGT 5213 Contract Changes, Terminations and Disputes
Credit Hours: 3
<i>Uses case studies and lectures to examine in depth the post-award management problems associated with contract administration. Covers contract changes, terminations, disputes and other issues. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.</i>
MGT 5214 Cost Principles, Effectiveness and Control
Credit Hours: 3
<i>Includes financial and accounting overviews of government acquisition policy and procedures. Requires completion of foundation requirements. Recommended: Background knowledge equivalent to MGT 5001 Managerial Accounting and MGT 5211 Procurement and Contract Management.</i>
MGT 5217 Contract and Subcontract Formulation
Credit Hours: 3

Studies in depth the pre-award phase of the federal acquisition process. Uses class discussions and case studies to examine the management problems from the perspective of the contracting office, requiring activity, courts, Congress and the contractors. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5218 Contract Negotiations and Incentive Contracts

Credit Hours: 3

Explores, analyzes and discusses negotiation concepts and techniques, and places them into practice using mock negotiations. Examines all types of contracts. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

Taken from 2020-2021 University Catalog, see

https://catalog.fit.edu/preview_program.php?catoid=9&poid=3300&returnto=396

Aerospace Engineering, M.S.

Major Code: 8134

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Classroom

Admission Materials: Letters of recommendation, résumé, objectives, transcripts

Location(s): Main Campus - Melbourne, Southern Maryland

Degree Requirements

The Master of Science in Aerospace Engineering is offered with both thesis and nonthesis options. Each option requires a minimum of 30 credit hours of coursework. Prior to the completion of nine credit hours, the student must submit for approval a master's degree program plan to indicate the path chosen and the specific courses to be taken. For the thesis option, up to six credit hours of thesis work may be included in the 30-credit-hour requirement. The thesis can 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. For the nonthesis option, a student may replace the thesis with additional elective courses and a final program examination, following approval of a written petition submitted to the department head. Generally, students wishing to pursue an academic career are encouraged to choose the thesis option.

Curriculum

The program of study leading to the master's degree in aerospace engineering is offered in the four listed areas of specialization. The minimum program requirements consist of nine credit hours of core courses, six credit hours of mathematics and 15 credit hours (which may include six credit hours of thesis) of electives. Within the 15 credit hours of electives, six credit hours of coursework are restricted electives. The department maintains a list of restricted electives for each specialization.

The nine credit hours of core courses must be chosen in consultation with the student's advisor from one of the following lists.

Aerodynamics and Fluid Dynamics

AEE 5120 Aerodynamics of Wings and Bodies

AEE 5130 Viscous Flows

AEE 5140 Experimental Fluid Dynamics

AEE 5150 Computational Fluid Dynamics

AEE 5160 Gas Dynamics

AEE 5180 Turbulent Flows
AEE 6130 Experimental Methods in Turbulence

Aerospace Structures and Materials

AEE 5050 Finite Element Fundamentals
AEE 5060 Applications in Finite Element Methods
AEE 5430 Design of Aerospace Structures
AEE 5470 Principles of Composite Materials
AEE 5480 Structural Dynamics
MEE 5410 Elasticity
MEE 5460 Fracture Mechanics and Fatigue of Materials

Combustion and Propulsion

AEE 5130 Viscous Flows
AEE 5150 Computational Fluid Dynamics
AEE 5160 Gas Dynamics
AEE 5360 Hypersonic Air-Breathing Engines
MEE 5310 Combustion Fundamentals
MEE 5320 Internal Combustion Engines
MEE 5350 Gas Turbines

Flight Mechanics and Controls

AEE 5801 Advanced Flight Dynamics and Control
AEE 5802 Multivariable Feedback Control Systems
AEE 5803 Nonlinear Control Systems
AEE 5804 Guidance and Navigation of Aerospace Vehicles
AEE 5805 Spaceflight Mechanics and Controls
AEE 5806 Dynamics and Robotics of Spacecraft Rendezvous and Capture

MEE 5610 Advanced Dynamics or MEE 5630 Modeling and Simulation of Dynamic Systems

Total Credits Required: 30

Electives are selected from these course offerings and appropriate courses in mathematics, in consultation with the student's advisor and committee. The topics of emphasis for aerospace engineering in the four areas of specialization include aerodynamics, computational fluid dynamics, experimental fluid dynamics, flow instability theory, combustion, aerospace propulsion and power, aerospace structures, composite materials, fracture mechanics and fatigue of materials, and flight dynamics and control.

Required Courses and Course Descriptions (3 core courses)

<p>AEE 5120 Aerodynamics of Wings and Bodies Credit Hours: 3 <i>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.</i></p>
<p>AEE 5130 Viscous Flows Credit Hours: 3 <i>Theory of Navier-Stokes equations; exact solutions for steady and unsteady plane, duct, jet and stagnation point flows; Stokes and Oseen approximations; the Prandtl concept of the boundary layer and similarity solutions Blasius, Hiemenz, Faulkner and Skan, Hartree, etc.; approximate solutions for nonsimilar boundary layers.</i></p>
<p>AEE 5140 Experimental Fluid Dynamics Credit Hours: 3 <i>Introduces students to test facilities such as wind tunnels and water tanks. Includes measurements of force and pressure distribution on airfoil principles and applications of laser Doppler velocimetry, hot-wire anemometry, flow visualization methods and modern data acquisition systems (LabView). Background knowledge in fluid mechanics.</i></p>
<p>AEE 5150 Computational Fluid Dynamics Credit Hours: 3 <i>Elliptic, parabolic and hyperbolic PDEs; finite-difference formulations; explicit and implicit methods, stability analysis; operator splitting, multistep methods; boundary conditions; grid generation techniques; applications involving Euler boundary layer and full Navier-Stokes equations. Requirement(s): Instructor approval Background knowledge in Fortran, C/C++ or another programming language (other than MATLAB or similar) and partial differential equations.</i></p>
<p>AEE 5160 Gas Dynamics Credit Hours: 3 <i>Differential conservation equations; one-dimensional steady flows; unsteady wave motion; small perturbations and linearized flows; bodies of revolution, conical flows, and slender body theory; blunt-body flows; three-dimensional supersonic flows; transonic flows; the method of characteristics and numerical computation for supersonic flows; real gas effects.</i></p>
<p>AEE 5180 Turbulent Flows Credit Hours: 3 <i>General introduction, isotropic, homogeneous and shear-flow turbulence, transport processes in turbulent flows, wall and free turbulent shear flows, atmospheric turbulence. Prerequisite: AEE 5130</i></p>
<p>AEE 6130 Experimental Methods in Turbulence Credit Hours: 3 <i>Physical description; hot-wire anemometry; correlation and spectrum analysis; fluctuating pressure and shear-stress measurements; use of laser Doppler velocimetry and particle velocimetry for fluid flow measurements; and flow visualization method. Prerequisite: AEE 5140</i></p>
<p>AEE 5050 Finite Element Fundamentals Credit Hours: 3 <i>Includes finite element formulation of a continuum, virtual work and energy principles, one- and two-dimensional problems; Ritz method, weighted residuals; time-dependent problems; isoparametric formulations</i></p>

<i>and recent developments using elementary finite element methods and existing software. Background knowledge of mechanics of materials.</i>
AEE 5060 Applications in Finite Element Methods Credit Hours: 3 <i>Emphasizes finite element simulation methods for problems in mechanical design; static solutions; eigenvalue techniques in stability and dynamic analysis; direct and reduced basis formulation of dynamical equations; analyses of structures; use of commercially available software. Background knowledge of mechanics of materials.</i>
AEE 5410 Elasticity Credit Hours: 3 <i>Analyzes stress and strain in two and three dimensions, equilibrium, compatibility and constitutive equations, energy methods, flexure, stretching, torsion and contact stress formulations, axially symmetric problems.</i>
AEE 5430 Design of Aerospace Structures Credit Hours: 3 <i>Applications of mechanics to lightweight structures. Considers designing with monolithic and advanced composite materials; stiffened shell structures; buckling instability; failure analysis; variable section beams subjected to nonuniform loads; and computer formulations used in solving structural problems. Background knowledge of aerospace structures.</i>
AEE 5460 Fracture Mechanics and Fatigue of Materials Credit Hours: 3 <i>Static and dynamic design and maintenance to prevent structural failure; presence of cracks, stress intensity factor, linear elastic and elastic-plastic fracture mechanics, fracture tests, fatigue crack initiation and propagation, environmental and corrosion effects, fatigue life prediction.</i>
AEE 5470 Principles of Composite Materials Credit Hours: 3 <i>Particulate and fiber composites; forms, properties and processing of constituent materials; manufacture of composites, interaction of constituents, micro- and macro-mechanics and design of composite materials; stress-strain tensors and their transformation; laminate theory of orthotropic materials; strength properties.</i>
AEE 5480 Structural Dynamics Credit Hours: 3 <i>Principles of dynamics applied to structural analysis, analysis of continuous media and discretized models, free vibration and forced response of structures, modal analysis, energy methods and approximate methods, applications in structural design and experimentation.</i>
AEE 5130 Viscous Flows Credit Hours: 3 <i>Theory of Navier-Stokes equations; exact solutions for steady and unsteady plane, duct, jet and stagnation point flows; Stokes and Oseen approximations; the Prandtl concept of the boundary layer and similarity solutions Blasius, Hiemenz, Faulkner and Skan, Hartree, etc.; approximate solutions for nonsimilar boundary layers.</i>
MEE 5310 Combustion Fundamentals

<p>Credit Hours: 3</p> <p><i>Includes equilibrium chemical thermodynamics and thermochemistry, chemical kinetics, transport phenomena and conservation equations; Rankine-Hugoniot theory, Chapman-Jouguet waves and detonation and deflagration; diffusion flames and premixed flames; flammability, ignition and quenching.</i></p>
<p>MEE 5320 Internal Combustion Engines</p> <p>Credit Hours: 3</p> <p><i>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.</i></p>
<p>MEE 5350 Gas Turbines</p> <p>Credit Hours: 3</p> <p><i>Introduces characteristics, performance analyses and design methodologies for stationary aircraft gas turbines. Topics include gas turbine cycle analyses, component design of combustors, compressors, turbines and nozzles, fluid dynamics and heat transfer, gas turbine fuels and emissions.</i></p>
<p>AEE 5360 Hypersonic Air-Breathing Engines</p> <p>Credit Hours: 3</p> <p><i>Introduces the analysis of hypersonic aerospace vehicles, with emphasis on air-breathing propulsion concepts and systems. Topics include performance behavior and cycle analysis of ramjets and scramjets, supersonic mixing and combustion processes, and component design. Prerequisite: AEE 5310</i></p>
<p>AEE 5610 Advanced Dynamics</p> <p>Credit Hours: 3</p> <p><i>Newtonian and analytical mechanics; rigid-body dynamics, Euler's equations and spinning bodies; Lagrange's equations, Routhian and Hamiltonian mechanics, canonical transformations and Hamilton-Jacobi theory; dissipative, gyroscopic and circulatory systems; applications of numerical methods to complex dynamics problems.</i></p>
<p>AEE 5801 Advanced Flight Dynamics and Control</p> <p>Credit Hours: 3</p> <p><i>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. Background in flight stability/dynamics and controls.</i></p>
<p>AEE 5802 Multivariable Feedback Control Systems</p> <p>Credit Hours: 3</p> <p><i>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. Background in control systems.</i></p>
<p>AEE 5803 Nonlinear Control Systems</p> <p>Credit Hours: 3</p> <p><i>Includes nonlinear system fundamentals (stability and dynamic peculiarities, methods of nonlinear analysis); basic nonlinear control methods (sliding control and feedback linearization, multidimensional extension);</i></p>

advanced nonlinear control methods (adaptive control, neural networks); and nonlinear control applications. Background in control systems.

AEE 5804 Guidance and Navigation of Aerospace Vehicles

Credit Hours: 3

Includes the principles for guidance and navigation of spacecraft, launch vehicles and missiles. Applies 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: AEE 5802

AEE 5805 Spaceflight Mechanics and Controls

Credit Hours: 3

Includes orbit determination and prediction; advanced orbit maneuvers, multiple-impulse and finite-duration thrust profiles; 3-D rigid-body dynamics, satellite stability and attitude control; Earth gravity field models and harmonics; orbit perturbations and variational methods; relative orbital mechanics and CWH equations; and 3-body problem. Background in spaceflight mechanics.

Mathematics (2 courses)

MTH 5102 LINEAR ALGEBRA

Credit Hours: 3

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. Requirement(s): Undergraduate course in multivariable calculus or linear algebra.

MTH 5130 THEORY OF COMPLEX VARIABLES

Credit Hours: 3

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. Prerequisite: MTH 2202, MTH 4101

MTH 5201 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 1

Credit Hours: 3

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. Prerequisite: MTH 2001, MTH 2201

MTH 5202 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 2

Credit Hours: 3

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. Prerequisite: MTH 5201

MTH 5401 APPLIED STATISTICAL ANALYSIS

Credit Hours: 3

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 methods. Prerequisite: MTH 2001

MTH 5411 MATHEMATICAL STATISTICS 1

Credit Hours: 3

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

Credit Hours: 3

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 (5 courses)

MTH 5007 Introduction to Optimization

Credit Hours: 3

An applied treatment of modeling, analysis and solution of deterministic (e.g., nonprobabilistic) problems. Topics include model formulation, linear programming, network flow, discrete optimization and dynamic programming. At least one upper-level undergraduate math course.

MTH 5009 Introduction to Probabilistic Models

Credit Hours: 3

An applied treatment of modeling, analysis and solution of problems involving probabilistic information. Topics chosen from decision analysis, inventory models, Markov chains, queuing theory, simulation, forecasting models and game theory. Requirement(s): Instructor approval or prerequisite course. Prerequisite: MTH 2401

MTH 5102 LINEAR ALGEBRA

Credit Hours: 3

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. Requirement(s): Undergraduate course in multivariable calculus or linear algebra.

MTH 5107 Optimization Models and Methods

Credit Hours: 3

Surveys popular optimization models and algorithms. Topics chosen from linear, integer, nonlinear, dynamic and combinatorial optimization. At least one upper-level undergraduate math course.

MTH 5201 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 1

Credit Hours: 3

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. Prerequisite: MTH 2001, MTH 2201

MTH 5301 Numerical Analysis

Credit Hours: 3

Includes Gaussian elimination and solution of linear systems of equations, root finding methods, systems of nonlinear equations, interpolation, numerical integration, initial value problems for ODEs and fast Fourier transform. Prerequisite: CSE 1502 or CSE 1503 or CSE 2050, MTH 2201

MTH 5401 APPLIED STATISTICAL ANALYSIS

Credit Hours: 3

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 methods. Prerequisite: MTH 2001

ECE 5201 Linear Systems 1

Credit Hours: 3

Studies linear spaces, linear operators and matrix calculus; mathematical description of linear dynamic systems, the relation between state variable descriptions and system transfer functions; controllability and observability of systems, realization of rational transfer function matrices and introduces nonlinear analysis. Prerequisite: ECE 4231 or MTH 2201

PHY 5015 Analytical Mechanics 1

Credit Hours: 3

A general treatment of dynamics of particles and rigid bodies, rotational dynamics, potential theory; Hamilton's principle and principle of least action, Lagrange's equations; and applications. Prerequisite: PHY 3011

SPC 5001 Introduction to Space Systems

Credit Hours: 3

Includes systems engineering, space flight history, space environment, astrodynamics, rocket propulsion, launch vehicle selection, space telecommunications, remote sensing, spacecraft configuration, structures, materials, power and thermal systems, launch and space mission operations, spacecraft navigation, guidance, control and military space applications.

SPC 5004 Space Propulsion Systems

Credit Hours: 3

Includes principles of rocket propulsion, liquid and solid chemical rockets, throttling and thrust vectoring, electric and electromagnetic propulsion, solar sailing, space tethers and nuclear radioisotope, fission reactor and fusion propulsion systems.

SPC 5010 Spacecraft Guidance, Navigation and Control

Credit Hours: 3

The principles and practice of electronic, inertial and stellar navigation, onboard and ground-controlled; attitude control methods and systems; and orbital guidance technology and systems.

SPC 5011 Human Space Systems

Credit Hours: 3

The role of astronauts in space. Astronaut and cosmonaut achievements in space research, extravehicular activity, long-duration space flight and lunar exploration. The space shuttle, space stations, future space habitats, lunar bases and expansion into heliocentric space.

<p>SPC 5012 Spacecraft Environment Credit Hours: 3 <i>The pre- and post-launch interactions between a space vehicle and its environment, including atmospheric density and composition; gravity and free-fall; mechanical, thermal electromagnetic field and energetic particle stresses; space debris impacts; and conducting space tether applications.</i></p>
<p>SPC 5014 Spacecraft Dynamics and Control Credit Hours: 3 <i>Studies the dynamics of spacecraft attitude motion and pointing controls. Includes coordinate conversions, spacecraft principle axes, attitude control thrusters, spin and momentum exchange devices. Also includes spacecraft control transfer functions, disturbance torques and stability.</i></p>
<p>SPC 5017 Aerospace Remote Sensing Systems Credit Hours: 3 <i>Principles and applications of remote sensing from the atmosphere and space; sensors for various wavelengths, imaging systems, data handling, image reconstruction and processing; contemporary remote sensing applications; geographic information systems and nonterrestrial atmospheres.</i></p>

Thesis Option (up to 6 credits)*

<p>AEE 5899 Final Semester Thesis Credit Hours: (0-2) <i>Variable registration for thesis completion after satisfaction of minimum registration requirements. (Requirements: Accepted petition to graduate and approval by Office of Graduate Programs.)</i></p>
<p>AEE 5999 Thesis Credit Hours: (3-6 credits) <i>Individual work under the direction of a member of the AEE graduate faculty on a selected topic.</i></p>

*A thesis committee of 3 members is established per graduate policy. Faculty participating as thesis committee members are approved by Graduate Council.

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3203&returnto=371

Master of Business Administration, M.B.A.

Major Code: 8300

Degree Awarded: Master of Business Administration

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Classroom, Online, Blended Online, Off-site

Admission Materials: Résumé, transcripts

Location(s): Aberdeen, MD; Eglin Air Force Base, FL; Florida Tech Online; Hampton Roads, VA; Main Campus - Melbourne; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Spaceport, FL

Degree Requirements

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

Curriculum

Candidates for the degree must successfully complete the following curriculum.

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

BUS 5602 Essentials of Business Development 2

Required Courses

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

BUS 5421 Managerial Economics

BUS 5431 Managerial Accounting

BUS 5440 Financial Management

BUS 5450 Organizational Behavior

BUS 5470 Marketing Management

BUS 5480 Strategic Management

Directed Electives

Six credit hours of directed electives (BUS 5000-level or higher) are required if BUS 5601 Essentials of Business Development 1 and BUS 5602 Essentials of Business Development 2 are waived.

Electives

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.

Total Credits Required: 36

Prerequisite and Required Courses and Course Descriptions

BUS 5601 Essentials of Business Development 1 Credit Hours: 0 <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 of a two-course sequence.</i>
BUS 5601 Essentials of Business Development 2 Credit Hours: 0 <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 of a two-course sequence. Prerequisite: BUS 5601</i>
BUS 5421 Managerial Economics Credit Hours: 3 <i>Provides an understanding of the microeconomic forces that influence firm decision-making. Includes 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.</i>
BUS 5431 Managerial Accounting Credit Hours: 3 <i>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.</i>
BUS 5440 Financial Management Credit Hours: 3 <i>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.</i>
BUS 5450 Organizational Behavior Credit Hours: 3

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

Credit Hours: 3

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

Credit Hours: 3

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.

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3263&returnto=396

Computer Information Systems, M.S.

Major Code: 8372

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode/s: Classroom, Online, Off-site

Admission Materials: Résumé, transcripts

Location/s: Main Campus - Melbourne; Hampton Roads, VA; Redstone/Huntsville, AL; Southern Maryland; Virtual

Degree Requirements

The program requires a minimum of 30 credit hours of courses including 15 hours of required computer information systems courses and 15 credit hours of graduate-level elective courses. The selection of electives requires program chair approval and can include CIS, CSE, CYB, ECE, ENM or SWE courses. CIS 5999 Thesis may be substituted for six elective credit hours. Students not completing a thesis must complete CIS 5898 Projects in Computer Information Systems that will count as three elective credits. The final program examination assessment is based on either CIS 5898 or CIS 5999.

Required Courses (15 credit hours)

CIS 5100 Data Structures and Programming	3
CIS 5200 Advanced Programming	3
CIS 5210 Integration of Database Systems.....	3
CIS 5240 Introduction to Computer Systems.....	3
CIS 5410 Computer Networks for Information Specialists 1.....	3

Electives (15 credit hours)

Electives must be approved by the student's advisor and can be selected from CIS, CSE, CYB, ECE, ENM or SWE courses numbered 5000 or above and must include completion of either CIS 5898 Projects in Computer Information Systems or CIS 5999 Thesis. The final program examination assessment is based on either CIS 5898 or CIS 5999.

Total Credits Required: 30

Required Courses and Course Descriptions

CIS 5100 DATA STRUCTURES AND PROGRAMMING

Credit Hours: 3

Introduces programming in an object-oriented language. Includes data structures. Aims to turn students with little or no programming experience into comfortable programmers. Also includes algorithms for use with stacks, queues and lists. Requirement(s): Required for CIS majors.

CIS 5200 ADVANCED PROGRAMMING**Credit Hours: 3**

Follows CIS 5100 and covers advanced programming techniques and methodologies for engineering the same. Encourages algorithm exploration and comparison, and demonstration of a superior level of programming expertise in an object-oriented language. Covers advanced data structures. Requirement(s): Required for CIS majors.

CIS 5210 INTEGRATION OF DATABASE SYSTEMS**Credit Hours: 3**

Studies database systems as an essential organization resource. Includes data architecture components and data storage configurations, and compares normalized and denormalized methods. Covers relational databases and the use of SQL for information retrieval. Also covers object databases.

CIS 5240 INTRODUCTION TO COMPUTER SYSTEMS**Credit Hours: 3**

Introduces computer system architecture including the CPU, memory, input/output and peripherals. Explores the services, protocols and mechanisms of a modern operating system including process and memory management, virtual memory and process scheduling. Provides an overview of cloud computing and virtualization. Prerequisite: CIS 5100 Corequisite: CIS 5100

CIS 5410 COMPUTER NETWORKS FOR INFORMATION SPECIALISTS 1**Credit Hours: 3**

Provides a broad set of fundamental topics related to computer networks including network layers, topologies, technologies, services and methods useful for the typical information systems specialists; TCP/IP; transmission protocols and client-server models. Introduces management and security of networks.

Program Completion Option (Capstone)**CIS 5898 PROJECTS IN COMPUTER INFORMATION SYSTEMS****Credit Hours: 3**

Acts as program capstone course that entails design and implementation of a significant project within the purview of information systems. Requires students to propose a project and have it approved by the instructor. Requirement(s): Not valid for credit for computer science or software engineering majors. Required for CIS majors. Satisfactory completion of 21 credit hours toward the degree.

Thesis Option (up to 6 credits)***CIS 5899 FINAL SEMESTER THESIS****Credit Hours: (0-2)**

Variable registration for thesis completion after satisfaction of minimum registration requirements. Requirements: Accepted petition to graduate and approval by Office of Graduate Programs.

CIS 5999 THESIS**Credit Hours: (3-6 credits)**

Research and preparation of a thesis under the direction of a member of the graduate faculty. A maximum of six credit hours may be applied toward the master of science degree requirements. Requirement(s): Program chair approval.

*A thesis committee of 3 members is established per graduate policy. Faculty participating as thesis committee members are approved by Graduate Council.

Taken from 2020-2021 University Catalog, see

https://catalog.fit.edu/preview_program.php?catoid=9&poid=3264&returnto=396

Computer Science, M.S.

Major Code: 8071

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode/s: Classroom

Admission Materials: Letters of recommendation, GRE, résumé, objectives, transcripts

Location/s: Main Campus-Melbourne, Southern Maryland

Degree Requirements

The Master of Science in Computer Science requires a minimum of 30 credit hours of approved graduate study. Students are encouraged to complete and successfully defend a thesis.

Students who decide not to write a thesis must pass a final program examination.

Curriculum

MTH 5051 Applied Discrete Mathematics

Core Courses Credit Hours: 9

Electives Credit Hours: 18

Seminar or Internship

Thesis or Final Program Examination

Core Courses

Select three courses from the following:

CSE 5210 Formal Languages and Automata Theory

CSE 5211 Analysis of Algorithms

CSE 5231 Compiler Networks

CSE 5251 Compiler Theory and Design

CSE 5290 Artificial Intelligence

Electives

Electives are selected from computer science, cybersecurity or software engineering courses (CSE, CYB or SWE) numbered 5000 or above. With approval from the academic advisor, courses from other disciplines can be counted toward the program requirements.

Seminar or Internship

Must be passed twice in any combination:

CSE 5500 Computer Science Seminar

CSE 5501 Computer Science Internship

Final Program Examination Option

Final Program Examination

Thesis Option

CSE 5999 Thesis Credit Hours: 6 (minimum)

Total Credits Required: 30**Required Computer Science Courses and Course Descriptions (3 courses)****CSE 5210 FORMAL LANGUAGES AND AUTOMATA THEORY****Credit Hours: 3**

Presents abstract models of computers (finite automata, pushdown automata and Turing machines) and the language classes they recognize or generate (regular, context-free and recursively enumerable). Also presents applications in compiler design, algorithms and complexity theory. Prerequisite: CSE 2010

CSE 5211 ANALYSIS OF ALGORITHMS**Credit Hours: 3**

Presents time and space complexity of computer algorithms. Includes algorithm classes, such as divide-and-conquer, greedy, dynamic programming and backtracking; techniques for solving recurrence equations; graph algorithms; searching and sorting; and deterministic and nondeterministic polynomial time problem classes. Prerequisite: CSE 2010 or CIS 5200, MTH 1002

CSE 5231 COMPUTER NETWORKS**Credit Hours: 3**

Introduces network design, protocol, function layering, networking architectures (TCP/IP, frame relay, ATM) and components (hubs, routers, switches), analytical issues (throughput, delay, bandwidth management, congestion and error control, sliding windows, retransmission strategies, contention resolution) and network traffic, analysis methodologies. Prerequisite: CSE 2400, MTH 1002

CSE 5251 COMPILER THEORY AND DESIGN**Credit Hours: 3**

Covers extensively the major topics of compiler design. Includes lexical analysis, scanner-generator tools, parsing, syntax-directed translation, static semantic checking, storage organizations, code generation and code optimization. Prerequisite: CSE 2010, CSE 3120

CSE 5290 ARTIFICIAL INTELLIGENCE**Credit Hours: 3**

Introduces the theoretical foundations of artificial intelligence, focusing on the areas of automated reasoning, search and heuristics. Introduces an AI language to implement concepts. Prerequisite: CIS 5200 or CSE 2010

Required Mathematics Course and Course Description (1 course)**MTH 5051 APPLIED DISCRETE MATHEMATICS****Credit Hours: 3**

Logic fundamentals, induction, recursion, combinatorial mathematics, discrete probability, graph theory fundamentals, trees, connectivity and traversability. Applications from several fields of science and engineering, including computer science, operations research, and computer and electrical engineering. Prerequisite: MTH 2051

Electives (3 courses)

Students select three electives from any computer science (CSE) 5000 series or software engineering (SWE) 5000 series offerings.

Advanced Electives (3 courses)

Students select three advanced electives from any computer science (CSE) 5600 series or above offering (may include up to 6 credits of thesis).

Program Requirement and Course Descriptions (1 course)

CSE 5500 COMPUTER SCIENCE SEMINAR

Credit Hours: 0

Presentations by faculty, graduate students and guest speakers on topics of current interest. May be repeated for credit.

CSE 5501 COMPUTER SCIENCE INTERNSHIP

Credit Hours: 0

Industry-based internship experience under the supervision of a graduate faculty member, to provide professional experience for graduate students without prior experience in a practical information technology setting. Requirement(s): At least nine graduate credit hours in computer sciences completed with at least a 3.0 GPA, and instructor approval.

Thesis Option (up to 6 credits)*

CSE 5899 Final Semester Thesis

Credit Hours: (0-2)

Variable registration for thesis completion after satisfaction of minimum registration requirements. Requirements: Accepted petition to graduate and approval by Office of Graduate Programs.

CSE 5999 Thesis

Credit Hours: (3-6 credits)

Individual work under the direction of a member of the CSE graduate faculty on a selected topic. Requirement(s): A maximum of six credit hours may be applied toward the master of science degree requirements. Thesis supervisor approval.

*A thesis committee of 3 members is established per graduate policy. Faculty participating as thesis committee members are approved by Graduate Council.

Taken from 2020-2021 University Catalog, see
http://catalog.fit.edu/preview_program.php?catoid=5&poid=1435

Electrical Engineering, M.S.

Major Code: 8042

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Classroom

Admission Materials: letters of recommendation, GRE, résumé, objectives, transcript

Location(s): Main Campus - Melbourne, Southern Maryland

Degree Requirements

The Master of Science in Electrical Engineering is offered with both thesis and nonthesis degree paths. Each requires a minimum of 30 credit hours of approved graduate study; however, course choices vary considerably depending on the student's area of interest. Prior to the completion of nine credit hours, a student must submit for approval a master's degree program plan to indicate the path chosen and the specific courses to be taken. Up to six credit hours of thesis may be included in the 30-credit-hour requirement. A nonthesis candidate must pass the master's final program examination. The master's final program exam measures the student's understanding of the technical concentration area they have chosen and corresponds to the department research areas.

Curriculum

To earn the master of science degree, the student must complete an approved program plan for a total of 30 credit hours. The program may be tailored to a specific area of study or it may follow the requirements for one of the available specialization areas.

Electromagnetics

ECE 5410 Electrodynamics 1

ECE 5425 Antennas 1

ECE 5431 Computational Electromagnetics

Approved electives (may include 6 credit hours of thesis) Credit Hours: 21

Photonics

ECE 5301 Semiconductor Device Theory

ECE 5350 Optical Electronics

ECE 5351 Fiber-Optic Communication Systems

Approved electives (may include 6 credit hours of thesis) Credit Hours: 21

Recommended Electives

ECE 5259 Medical Imaging

ECE 5311 Microelectronics Fabrication Lab

ECE 5355 Electrooptics Laboratory

ECE 5410 Electrodynamics 1
ECE 5418 Field Theory of Guided Waves 1
MTH 5201 Mathematical Methods in Science and Engineering 1
MTH 5202 Mathematical Methods in Science and Engineering 2
PHY 5020 Optics

Systems and Information Processing

ECE 5201 Linear Systems 1
ECE 5245 Digital Signal Processing 1
MTH 5425 Theory of Stochastic Signals
Mathematics Elective Credit Hours: 3
Approved electives (may include 6 credit hours of thesis) Credit Hours: 21

ECE 5223 Digital Communications or ECE 5234 Communications Theory

Wireless Systems and Technology

All courses from the core curriculum list Credit Hours: 15
Approved electives (may include 6 credit hours of thesis) Credit Hours: 15
ECE 5111 Radio Frequency Propagation
ECE 5201 Linear Systems
ECE 5234 Communication Theory
ECE 5245 Digital Signal Processing 1
MTH 5425 Theory of Stochastic Signals

Recommended Electives

ECE 5113 Wireless Local Area Networks
ECE 5115 Modern Wireless Design Concepts
ECE 5118 Wireless Sensor Networks
ECE 5221 Personal Communication Systems
ECE 5223 Digital Communications
ECE 5238 Error Control Coding
ECE 5248 Advanced Filtering
ECE 5251 Radar Systems
ECE 5418 Field Theory of Guided Waves 1
ECE 5425 Antennas 1
ECE 5246 Antennas 2

With the approval of the student's advisor, other 5000-level courses may be added to the list of the approved electives.

Total Credits Required: 30

Required Courses and Course Descriptions

<p>ECE 5111 Radio Frequency Propagation Credit Hours: 3 <i>Link budgets, free space antenna radiation patterns, multipath, fading, interference, propagation, antenna radiation patterns, multipath, fading, interference, reflection, refraction, rain attenuation, indoor propagation and RF safety. Considers applications to radar and terrestrial as well as satellite communication systems. Real world affects and impairment reduction methods.</i></p>
<p>ECE 5201 Linear Systems 1 Credit Hours: 3 <i>Studies linear spaces, linear operators and matrix calculus; mathematical description of linear dynamic systems, the relation between state variable descriptions and system transfer functions; controllability and observability of systems, realization of rational transfer function matrices and introduces nonlinear analysis.</i></p>
<p>ECE 5234 Communications Theory Credit Hours: 3 <i>Covers theory of signal spaces; dimensionality and distance; optimum methods of statistical detection and estimation; characteristics of noise; introduction to information theory, including channel capacity, source coding and channel coding; and time-bandwidth limitations and rate-distortion theory.</i></p>
<p>ECE 5245 Digital Signal Processing 1 Credit Hours: 3 <i>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.</i></p>
<p>MTH 5425 Theory of Stochastic Signals Credit Hours: 3 <i>Covers univariate and multivariate distributions, generating and moment generating functions; autocorrelation, wide-sense, strict-sense stationary, voltage, Poisson, Wiener, random telegraph signal and white noise processes; Direct delta function, Fourier transform, system response, transfer function and spectral analysis. Requirement(s): Instructor approval.</i></p>
<p>ECE 5410 Electrodynamics 1 Credit Hours: 3 <i>Electrostatics and boundary value problems; solutions of Laplace's and Poisson's equations in Cartesian, spherical and cylindrical coordinates; electrostatic multipole fields; fields in dielectrics; magnetostatics; Maxwell's equations; plane electromagnetic waves; guided waves and resonant cavities; antennas and vector diffraction.</i></p>
<p>ECE 5425 Antennas 1 Credit Hours: 3 <i>Reviews basic electromagnetic principles; radiation from infinitesimal electric and magnetic dipoles; antenna directivity and gain; the one-way and radar range equations; array theory and phased arrays; and wire antennas and broadband antennas.</i></p>
<p>ECE 5431 Computational Electromagnetics Credit Hours: 3 <i>Finite difference solutions of differential equations; moment method solutions of integral equations; FDTD, FEM and GTD in electrodynamics.</i></p>
<p>ECE 5301 Semiconductor Device Theory Credit Hours: 3</p>

Reviews basic semiconductor physics and band theory; development of detailed theory of p-n junctions; Schottky barrier diodes, bipolar transistors and heterojunctions. Introduction of field effect transistor theory include JFETs, MOSFETs and VLSI technologies.

ECE 5350 Optical Electronics

Credit Hours: 3

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 bistable devices.

ECE 5351 Fiber-Optic Communication Systems

Credit Hours: 3

Includes optical fiber links, comparison between optical and electronic communication links; data encoding and bit error rates; properties of single, multimode and polarization preserving optical fibers, including attenuation, pulse spreading, bandwidth and maximum bit rate; transmitter and receiver design considerations, link design.

ECE 5234 Communications Theory

Credit Hours: 3

Covers theory of signal spaces; dimensionality and distance; optimum methods of statistical detection and estimation; characteristics of noise; introduction to information theory, including channel capacity, source coding and channel coding; and time-bandwidth limitations and rate-distortion theory.

ECE 5223 Digital Communications

Credit Hours: 3

Covers physical media, digital modulation, detection, intersymbol interference, adaptive equalization, spectrum control, error control and synchronization.

Mathematics (3 credit elective)

MTH 5xxx

Any 5xxx math course. Course is required for MSEE Systems and Information Processing concentration.

Electives (5 courses)

ECE 5259 Medical Imaging

Credit Hours: 3

Presents the interdisciplinary principles of medical imaging techniques such as diagnostic ultrasound, radiography, x-ray computer tomography (CT) and magnetic resonance imaging (MRI). Includes the physical principles, noise modeling and signal processing for each imaging modality.

ECE 5311 Microelectronics Fabrication Lab

Credit Hours: 3

Hands-on fabrication and testing of integrated circuits including oxidation, diffusion, photolithography, metallization and etching. Students perform all process steps required, beginning with polished silicon wafers and ending with completed integrated circuits that are tested and characterized.

ECE 5352 Fiber-Optic Sensor Systems

Credit Hours: 3

<p><i>Studies fundamental theory and state-of-the-art fiber-optic sensor systems; comparison with conventional sensors for strain, temperature, electric and magnetic fields; specialized fiber-optic components; use of multimode, singlemode, polarization preserving and high birefringence optical fibers, interferometric- and intensity-based sensor architectures.</i></p>
<p>ECE 5355 Electrooptics Laboratory Credit Hours: 3 <i>Lectures and experiments in photonics with emphasis on fiber optics, and design, fabrication and testing of communications sensor systems.</i></p>
<p>ECE 5410 Electrodynamics 1 Credit Hours: 3 <i>Electrostatics and boundary value problems; solutions of Laplace's and Poisson's equations in Cartesian, spherical and cylindrical coordinates; electrostatic multipole fields; fields in dielectrics; magnetostatics; Maxwell's equations; plane electromagnetic waves; guided waves and resonant cavities; antennas and vector diffraction.</i></p>
<p>ECE 5418 Field Theory of Guided Waves 1 Credit Hours: 3 <i>Maxwell's equations; time-harmonic electromagnetic waves; vector and scalar wave equations, analysis of electromagnetic field modes in rectangular and circular cylindrical waveguides using vector potential methods; phase and group velocity; transverse wave impedance; propagating waves and evanescent fields; resonant cavities.</i></p>
<p>MTH 5201 Mathematical Methods in Science and Engineering 1 Credit Hours: 3 <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. Background knowledge equivalent to MTH 2001 Calculus 3 and MTH 2201 Differential Equations/Linear Algebra.</i></p>
<p>MTH 5202 Mathematical Methods in Science and Engineering 2 Credit Hours: 3 <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 variables for heat and wave equations on infinite intervals. Vector integral calculus. Prerequisite: MTH 5201</i></p>
<p>PHY 5020 Optics Credit Hours: 3 <i>Applications to physics, space sciences and engineering. Includes geometrical optics (briefly), physical optics, including Fraunhofer and Fresnel diffraction; interactions with dielectric materials; Fresnel equations; and applications including lasers, holography, polarization and nonlinear optics materials. Additional graduate-level projects will be assigned including computer ray tracing and computer lens design.</i></p>
<p>ECE 5113 Wireless Local Area Networks</p>

Credit Hours: 3 <i>Provides the basics of wireless networking and WLAN technologies, the leading WLAN standards, WLAN configurations, WLAN implementation considerations, the benefits and applications of WLANs, WLAN trends and case studies</i>
ECE 5115 Modern Wireless Design Concepts Credit Hours: 3 <i>Key design criteria, techniques and component technologies of major components or sub-systems for wireless applications are treated, including transmitters and power amplifiers, receivers, modems, synthesizers, mixers, and duplexers.</i>
ECE 5118 Wireless Sensor Networks Credit Hours: 3 <i>Pervasive networks and network embedded systems, power-aware issues in wireless sensor networks, collaborative signal and information processing, routing and MAC protocols in sensor networks, clustering and coordination in sensor networks, sensor networks applications.</i>
ECE 5221 Personal Communication Systems Credit Hours: 3 <i>Overviews the principles of operation, general architectures, access methods, modulation schemes and performance of cellular and personal communications systems. Presents design criteria for modern systems and use of real world tools to demonstrate design concepts.</i>
ECE 5223 Digital Communications Credit Hours: 3 <i>Covers physical media, digital modulation, detection, intersymbol interference, adaptive equalization, spectrum control, error control and synchronization.</i>
ECE 5238 Error Control Coding Credit Hours: 3 <i>Introduces algebra, linear block codes, Galois fields, cyclic codes, circuits for cyclic codes, BCH codes, spectral techniques for encoding and decoding, and convolutional codes.</i>
ECE 5248 Advanced Filtering Credit Hours: 3 <i>Bayesian estimation theory; filtering, smoothing and prediction for linear and nonlinear systems, Gaussian and non-Gaussian models, and for known or unknown models; fast algorithms for filter design and implementation; linear, nonlinear and adaptive filters; applications.</i>
ECE 5251 Radar Systems Credit Hours: 3 <i>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.</i>
ECE 5425 Antennas 1 Credit Hours: 3

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

ECE 5426 Antennas 2

Credit Hours: 3

Equivalence principles; vector diffraction and its application to horn and reflector antennas; antenna pattern synthesis.

Thesis Option (up to 6 credits)*

ECE 5899 Final Semester Thesis

Credit Hours: (0-2)

Variable registration for thesis completion after satisfaction of minimum registration requirements. (Requirements: Accepted petition to graduate and approval by Office of Graduate Programs.)

ECE 5999 Thesis

Credit Hours: (3-6 credits)

Individual work under the direction of a member of the ECE graduate faculty on a selected topic.

*A thesis committee of 3 members is established per graduate policy. Faculty participating as thesis committee members are approved by Graduate Council.

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3275&returnto=396

Engineering Management, M.S.

Major Code: 8075

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Classroom

Admission Materials: letters of recommendation, GRE, résumé, objectives, transcripts

Location(s): Main Campus - Melbourne; Redstone/Huntsville, AL; Southern Maryland, MD

Degree Requirements

The degree requires a minimum of 30 semester credit hours. 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 ENM 5999 Thesis Research. 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 before graduating. General degree requirements are presented under Graduate Academic Information.

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.

Required Courses

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.

ENM 5100 Quality Engineering

ENM 5200 Project Engineering

ENM 5330 Topics in Engineering Operations and Logistics

ENM 5420 Technology Commercialization Strategies
ENM 5430 Strategic Situation Analysis Using Game Theory

Elective Courses

A comprehensive list of elective courses is maintained by the department and is available on the department's website. Students must choose the appropriate number of courses from this list (five for nonthesis students and three for thesis students) to meet their elective course requirement.

Total Credits Required: 30

Required Courses and Course Descriptions

ENM 5100 Quality Engineering Credit Hours: 3 <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>
ENM 5200 Project Engineering Credit Hours: 3 <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>
ENM 5330 Topics in Engineering Operations and Logistics Credit Hours: 3 <i>Topics such as forecasting, plant location, facility layout, inventory systems, maintenance, process engineering, supply chains, scheduling, manufacturing and materials handling.</i>
ENM 5420 Technology Commercialization Strategies Credit Hours: 3 <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>
ENM 5430 Strategic Situation Analysis Using Game Theory Credit Hours: 3 <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>

Taken from 2020-2021 University Catalog, see

https://catalog.fit.edu/preview_program.php?catoid=9&poid=3301&returnto=396

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: Letters of recommendation, GRE, résumé, objectives, transcripts

Location(s): Main Campus - Melbourne, Eglin Air Force Base, FL; Southern Maryland, MD

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 the 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.

Curriculum

Candidates for the Master of Science in Flight Test Engineering must complete the minimum course requirements that consists of 12 credit hours of core courses, six credit hours of mathematics, and 12 credit hours of restricted electives (may include six credit hours of thesis).

Core Courses

ENM 5200 Project Engineering

FTE 5701 Airplane Performance Flight Test Engineering

FTE 5702 Airplane Stability and Control Flight Test Engineering

FTE 5703 Airplane Avionics Flight Test Engineering

Mathematics (6 credit hours)

MTH 5102 Linear Algebra

MTH 5130 Theory of Complex Variables

MTH 5201 Mathematical Methods in Science and Engineering 1
MTH 5202 Mathematical Methods in Science and Engineering 2
MTH 5401 Applied Statistical Analysis
MTH 5411 Mathematical Statistics 1
MTH 5412 Mathematical Statistics 2

Electives (12 credit hours)

Electives may include six credit hours of thesis.

AEE 5120 Aerodynamics of Wings and Bodies
AEE 5486 Crashworthiness
AEE 5801 Advanced Flight Dynamics and Control
AEE 5802 Multivariable Feedback Control Systems
AEE 5803 Nonlinear Control Systems
AEE 5804 Guidance and Navigation of Aerospace Vehicles
AVF 5303 Airplane Avionics Flight Test Evaluation
ECE 5245 Digital Signal Processing 1
ECE 5251 Radar Systems
ECE 5350 Optical Electronics
ECE 5425 Antennas 1
MEE 4024 Mechanical Vibrations
MEE 5320 Internal Combustion Engines
SYS 5360 Electrooptics/Infrared Systems Engineering

Total Credits Required: 30

Required Courses and Course Descriptions

ENM 5200 Project Engineering

Credit Hours: 3

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.

FTE 5701 Airplane Performance Flight Test Engineering

Credit Hours: 3

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. Requirement(s): Program chair approval

FTE 5702 Airplane Stability and Control Flight Test Engineering

Credit Hours: 3

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. Requirement(s): Program chair approval

FTE 5703 Airplane Avionics Flight Test Engineering**Credit Hours: 3**

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.

Requirement(s): Program chair approval

Mathematics (6 credit hours)**MTH 5102 LINEAR ALGEBRA****Credit Hours: 3**

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. Requirement(s): Undergraduate course in multivariable calculus or linear algebra.

MTH 5130 THEORY OF COMPLEX VARIABLES**Credit Hours: 3**

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. Prerequisite: MTH 2202, MTH 4101

MTH 5201 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 1**Credit Hours: 3**

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. Prerequisite: MTH 2001, MTH 2201

MTH 5202 MATHEMATICAL METHODS IN SCIENCE AND ENGINEERING 2**Credit Hours: 3**

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. Prerequisite: MTH 5201

MTH 5401 APPLIED STATISTICAL ANALYSIS**Credit Hours: 3**

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 methods. Prerequisite: MTH 2001

MTH 5411 MATHEMATICAL STATISTICS 1**Credit Hours: 3**

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**Credit Hours: 3**

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 (12 credit hours)

AEE 5120 Aerodynamics of Wings and Bodies

Credit Hours: 3

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.

AEE 5486 Crashworthiness

Credit Hours: 3

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.

AEE 5801 Advanced Flight Dynamics and Control

Credit Hours: 3

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. Background in flight stability/dynamics and controls.

AEE 5802 Multivariable Feedback Control Systems

Credit Hours: 3

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. Background in control systems.

AEE 5803 Nonlinear Control Systems

Credit Hours: 3

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. Background in control systems.

AEE 5804 Guidance and Navigation of Aerospace Vehicles

Credit Hours: 3

Includes the principles for guidance and navigation of spacecraft, launch vehicles and missiles. Applies 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: AEE 5802

AVF 5303 Airplane Avionics Flight Test Evaluation

Credit Hours: 3

<p><i>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): Prior completion of foundation requirements</i></p>
<p>ECE 5245 Digital Signal Processing 1 Credit Hours: 3 <i>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.</i></p>
<p>ECE 5251 Radar Systems Credit Hours: 3 <i>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.</i></p>
<p>ECE 5350 Optical Electronics Credit Hours: 3 <i>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 bistable devices.</i></p>
<p>ECE 5425 Antennas 1 Credit Hours: 3 <i>Reviews basic electromagnetic principles; radiation from infinitesimal electric and magnetic dipoles; antenna directivity and gain; the one-way and radar range equations; array theory and phased arrays; and wire antennas and broadband antennas.</i></p>
<p>MEE 4024 Mechanical Vibrations Credit Hours: 3 <i>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: AEE 3083 and MEE 2082 and (MTH 2201 or MTH 3200)</i></p>
<p>MEE 5320 Internal Combustion Engines Credit Hours: 3 <i>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.</i></p>
<p>SYS 5360 Electrooptics/Infrared Systems Engineering Credit Hours: 3 <i>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.</i></p>

Thesis Option (up to 6 credits)*

FTE 5899 Final Semester Thesis

Credit Hours: (0-2)

*Variable registration for thesis completion after satisfaction of minimum registration requirements.
(Requirements: Accepted petition to graduate and approval by Office of Graduate Programs.)*

FTE 5999 Thesis

Credit Hours: (3-6 credits)

Individual work under the direction of a member of the FTE graduate faculty on a selected topic.

*A thesis committee of 3 members is established per graduate policy. Faculty participating as thesis committee members are approved by Graduate Council.

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3415&returnto=396

Flight Test Engineering Graduate Certificate

Major Code: 8245

Degree Awarded: Graduate Certificate

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Classroom

Admission Materials: Transcripts

Location(s): Main Campus - Melbourne, Eglin Air Force Base, FL; Southern Maryland, MD

Curriculum

The certificate is awarded to students who complete the required courses with at least a 3.0 cumulative GPA.

Required Courses

FTE 5701 Airplane Performance Flight Test Engineering

FTE 5702 Airplane Stability and Control Flight Test Engineering

Select two of the following:

ENM 5200 Project Engineering

FTE 5703 Airplane Avionics Flight Test Engineering

FTE 5704 Helicopter Flight Test

FTE 5705 Weapon Systems Flight Test

FTE 5706 Propulsion Testing

FTE 5707 Hazardous Flight Test

Total Credits Required: 12

Required Courses and Course Descriptions

FTE 5701 Airplane Performance Flight Test Engineering

Credit Hours: 3

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. Requirement(s): Program chair approval

FTE 5702 Airplane Stability and Control Flight Test Engineering

Credit Hours: 3

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. Requirement(s): Program chair approval

Select Two (6 credit hours)

ENM 5200 Project Engineering

Credit Hours: 3

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.

FTE 5703 Airplane Avionics Flight Test Engineering

Credit Hours: 3

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. Requirement(s): Program chair approval

FTE 5704 Helicopter Flight Test

Credit Hours: 3

Examines flight test engineering techniques to determine helicopter performance. Includes flight labs for data collection. Presents theory and methods for measuring hover, climb and level-flight performance. Addresses differences between airplane and helicopter flight testing.

FTE 5705 Weapon Systems Flight Test

Credit Hours: 3

Examines flight test engineering techniques to evaluate aircraft weapon systems. Includes labs for data collection. Presents theory and methods for testing electrooptic, infrared, radar and electronic warfare systems. Covers weapons integration, night-vision imaging systems and helmet-mounted displays.

FTE 5706 Propulsion Testing

Credit Hours: 3

Examines ground and flight testing techniques to evaluate propulsion systems. Includes labs for data collection. Presents theory and methods for testing reciprocating and jet engines. Covers uninstalled and installed tests to determine thrust and power.

FTE 5707 Hazardous Flight Test

Credit Hours: 3

Examines planning and execution of hazardous flight tests. Includes case studies on historic mishaps. Covers the flight test safety review process including the development of general minimizing procedures and test-unique hazard analyses. Also includes demonstrations of control room equipment and protocols.

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3225&returnto=371

Management, M.S.

Major Code: 8381

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Online, Classroom, Off-site

Admission Materials: Résumé, transcripts

Location(s): Aberdeen, MD; Eglin Air Force Base, FL; Fort Lee, VA; Hampton Roads, VA; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Virtual Site

Degree Requirements

The degree of Master of Science in Management is conferred upon students who have successfully completed 33 credit hours of graduate coursework plus other course requirements as listed on the student's approved graduate program plan. Students without an adequate undergraduate background will be required to complete all or part of the program prerequisites. Students may choose elective courses with the approval of both the faculty advisor and the program head. Students with undergraduate credits for courses that they believe are equivalent to the program prerequisites should consult with their advisor concerning waiver of those prerequisites. In addition, computer literacy is required as a prerequisite. It can be demonstrated by the applicant's undergraduate coursework, passing a proficiency examination offered by the extended studies department or by completing a suitable computer course.

Curriculum

Candidates for the degree must successfully complete the following curriculum.

Program Prerequisite

Prerequisite is noncredit for this program.

MTH 1701 College Algebra

Note: Computer literacy is required as a prerequisite. It can be demonstrated by the applicant's undergraduate coursework, passing a proficiency examination offered by the extended studies department or by completing a suitable computer course.

Required Courses

MGT 5000 Financial Accounting

MGT 5002 Corporate Finance

MGT 5011 Management Theory and Thought

MGT 5013 Organizational Behavior

MGT 5015 Organizational Planning and Development

MGT 5020 Applied Management Project (*serves as the capstone course for the program*)

MGT 5033 Human Resources Management
MGT 5101 Leadership Theory and Effective Management
MGT 5106 Organizational Communication
Electives Credit Hours: 6

Note: Electives may be taken with approval from both the faculty advisor and the program head from other graduate-level offerings in other colleges or academic units.

Total Credits Required: 33

Required Courses and Course Descriptions

MGT 5000 Financial Accounting Credit Hours: 3 <i>Studies accounting concepts, the accounting model, measurement processes, financial statements, financial analysis, the accounting cycle, monetary and fixed assets, inventory, current and long-term liabilities, and equity structures of partnerships, proprietorships and corporations.</i>
MGT 5002 Corporate Finance Credit Hours: 3 <i>Covers concepts and tools of corporate financial management including corporate financial planning, forecasting, budgeting, quantitative techniques and practices. Considers the importance of ethics and the international aspects in financial decision-making. Recommended: Background knowledge equivalent to MGT 5000 Financial Accounting.</i>
MGT 5011 Management Theory and Thought Credit Hours: 3 <i>Overviews classical and contemporary management philosophies and theories. Focuses on managing enterprises in a rapidly changing global economy. Includes developing strategic vision, planning, organizing, directing and controlling, social responsibility and international management.</i>
MGT 5013 Organizational Behavior Credit Hours: 3 <i>Covers the contributions to management theory made by the behavioral sciences. Gives a better understanding of the human being and why he acts as he does. Studies individual and group behavior. Extensively uses current periodicals and case materials.</i>
MGT 5015 Organizational Planning and Development Credit Hours: 3 <i>Studies the concepts, theory, research and operational problems of modern organizations. Includes classical and modern organizational theory, emphasizing the latter. Covers recent research findings and the theory of human relations in industry. Involves students in case studies.</i>
MGT 5020 Applied Management Project Credit Hours: 3 <i>Covers concepts, tools and techniques for evaluation of research proposals and studies. Involves designing, conducting, evaluating and presenting oral and written forms of research. Assignments build on quantitative and qualitative research methods. Requirement(s): Recommended for the graduating semester. May serve as the capstone for certain majors. Must be taken during the last 12 credit hours of the program.</i>

<p>MGT 5033 Human Resources Management Credit Hours: 3 <i>Explores issues surrounding the employment of human resources in various organizational settings using lectures/guided discussions and case studies. May include recruitment/selection, job analyses/evaluation, equal employment opportunity, training/development, compensation/benefits, appraisal, labor relations, health and safety, and separation/retirement.</i></p>
<p>MGT 5101 Leadership Theory and Effective Management Credit Hours: 3 <i>Introduces and examines historical development of leadership theory and supporting research. Considers past and contemporary theory in self-analysis by students to define their own leadership styles. Recommended: Background knowledge equivalent to MGT 5013 Organizational Behavior.</i></p>
<p>MGT 5106 Organizational Communication Credit Hours: 3 <i>Includes basic communication theory and the effects of communication on human behavior and organizational effectiveness. Provides a basic understanding of organizational communication theory. Uses case studies and experiential exercises to improve communications skills.</i></p>

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3226&returnto=371

Management - Acquisition and Contract Management, M.S.

Major Code: 8403

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Online, Classroom, Off-site

Admission Materials: Résumé, transcripts

Location(s): Aberdeen, MD; Fort Lee, VA; Hampton Roads, VA; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Virtual Site

Degree Requirements

The degree of Master of Science in Management – Acquisition and Contract Management is conferred upon students who have successfully completed 33 credit hours of graduate coursework plus other course requirements as listed on the student's approved graduate program plan. Students without an adequate undergraduate background will be required to complete all or part of the program prerequisites. Students may choose elective courses with the approval of both the faculty advisor and the program head. Students with undergraduate credits for courses that they believe are equivalent to the program prerequisites should consult with their advisor concerning waiver of those prerequisites.

Curriculum

Candidates for the degree must successfully complete the following curriculum.

Program Prerequisite

Prerequisite is noncredit for this program.

MTH 1701 College Algebra

Note: Computer literacy is required as a prerequisite. It can be demonstrated by the applicant's undergraduate coursework, passing a proficiency examination offered by the extended studies department or by completing a suitable computer course.

Required Courses

MGT 5000 Financial Accounting

MGT 5002 Corporate Finance

MGT 5011 Management Theory and Thought

MGT 5013 Organizational Behavior

MGT 5020 Applied Management Project (*serves as the capstone course for the program*)

MGT 5033 Human Resources Management

MGT 5101 Leadership Theory and Effective Management

MGT 5106 Organizational Communication

Electives - Select three courses:

MGT 5084 Materiel Acquisition Management
 MGT 5211 Procurement and Contract Management
 MGT 5212 Advanced Procurement and Contract Management
 MGT 5213 Contract Changes, Terminations and Disputes
 MGT 5214 Cost Principles, Effectiveness and Control
 MGT 5217 Contract and Subcontract Formulation
 MGT 5218 Contract Negotiations and Incentive Contracts
 MGT 5231 Government Contract Law
 MGT 5240 Business and Legal Aspects of Intellectual Property
 MGT 5270 Special Topics in Contracts Management

Note: Electives may be taken with approval from both the faculty advisor and the program head from other graduate-level offerings in other colleges or academic units.

Total Credits Required: 33

Required Courses and Course Descriptions

MGT 5000 Financial Accounting Credit Hours: 3 <i>Studies accounting concepts, the accounting model, measurement processes, financial statements, financial analysis, the accounting cycle, monetary and fixed assets, inventory, current and long-term liabilities, and equity structures of partnerships, proprietorships and corporations.</i>
MGT 5002 Corporate Finance Credit Hours: 3 <i>Covers concepts and tools of corporate financial management including corporate financial planning, forecasting, budgeting, quantitative techniques and practices. Considers the importance of ethics and the international aspects in financial decision-making. Recommended: Background knowledge equivalent to MGT 5000 Financial Accounting.</i>
MGT 5011 Management Theory and Thought Credit Hours: 3 <i>Overviews classical and contemporary management philosophies and theories. Focuses on managing enterprises in a rapidly changing global economy. Includes developing strategic vision, planning, organizing, directing and controlling, social responsibility and international management.</i>
MGT 5013 Organizational Behavior Credit Hours: 3 <i>Covers the contributions to management theory made by the behavioral sciences. Gives a better understanding of the human being and why he acts as he does. Studies individual and group behavior. Extensively uses current periodicals and case materials.</i>
MGT 5020 Applied Management Project Credit Hours: 3 <i>Covers concepts, tools and techniques for evaluation of research proposals and studies. Involves designing, conducting, evaluating and presenting oral and written forms of research. Assignments build on quantitative</i>

and qualitative research methods. Requirement(s): Recommended for the graduating semester. May serve as the capstone for certain majors. Must be taken during the last 12 credit hours of the program.

MGT 5033 Human Resources Management

Credit Hours: 3

Explores issues surrounding the employment of human resources in various organizational settings using lectures/guided discussions and case studies. May include recruitment/selection, job analyses/evaluation, equal employment opportunity, training/development, compensation/benefits, appraisal, labor relations, health and safety, and separation/retirement.

MGT 5101 Leadership Theory and Effective Management

Credit Hours: 3

Introduces and examines historical development of leadership theory and supporting research. Considers past and contemporary theory in self-analysis by students to define their own leadership styles. Recommended: Background knowledge equivalent to MGT 5013 Organizational Behavior.

MGT 5106 Organizational Communication

Credit Hours: 3

Includes basic communication theory and the effects of communication on human behavior and organizational effectiveness. Provides a basic understanding of organizational communication theory. Uses case studies and experiential exercises to improve communications skills.

Elective Courses and Course Descriptions

MGT 5084 Materiel Acquisition Management

Credit Hours: 3

Examines the life cycle process of acquisition of materiel and materiel systems. Examines systems management and its application from acquisition to termination. Studies need requirements, cost and schedule considerations and procurement procedures. Requirement(s): May serve as the capstone for certain majors.

MGT 5211 Procurement and Contract Management

Credit Hours: 3

Overviews in depth the federal acquisition process and introduces the basic concepts, policies and procedures incident to government contracting through the FAR and supplementing directives.

MGT 5212 Advanced Procurement and Contract Management

Credit Hours: 3

Covers principles, policies, concepts and procedures in management of contracts and subcontracts. Includes rules of interpretation, subcontracting terms and conditions, in-depth examination of significant contract clauses, patent/data provisions, risk allocation and assumption, impossibility of performance, product liability, warranties and claims. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5213 Contract Changes, Terminations and Disputes

Credit Hours: 3

Uses case studies and lectures to examine in depth the post-award management problems associated with contract administration. Covers contract changes, terminations, disputes and other issues. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5214 Cost Principles, Effectiveness and Control

Credit Hours: 3

Includes financial and accounting overviews of government acquisition policy and procedures. Requires completion of foundation requirements. Recommended: Background knowledge equivalent to MGT 5001 Managerial Accounting and MGT 5211 Procurement and Contract Management.

MGT 5217 Contract and Subcontract Formulation

Credit Hours: 3

Studies in depth the pre-award phase of the federal acquisition process. Uses class discussions and case studies to examine the management problems from the perspective of the contracting office, requiring activity, courts, Congress and the contractors. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5218 Contract Negotiations and Incentive Contracts

Credit Hours: 3

Explores, analyzes and discusses negotiation concepts and techniques, and places them into practice using mock negotiations. Examines all types of contracts. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

MGT 5231 Government Contract Law

Credit Hours: 3

Focuses on the method rather than the material. Uses the case method of study and basic source material to cover all facets of procurement law. Emphasizes legal methods, logic and the developmental concepts of procurement law.

MGT 5240 Business and Legal Aspects of Intellectual Property

Credit Hours: 3

Examines patents, trademark, copyright and trade secret law.

MGT 5270 Special Topics in Contracts Management

Credit Hours: 3

Independent study with a faculty member in an area of contract management in greater depth than is normally possible in a regular class. Requires a comprehensive term paper. Requirement(s): Instructor approval. Recommended: Background knowledge equivalent to MGT 5211 Procurement and Contract Management.

Taken from 2020-2021 University Catalog, see
https://catalog.fit.edu/preview_program.php?catoid=9&poid=3228&returnto=371

Management - Information Systems, M.S.

Major Code: 8406

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Online, Classroom, Off-site

Admission Materials: Résumé, transcripts

Location(s): Aberdeen, MD; Hampton Roads, VA; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Virtual Site

Degree Requirements

The degree of Master of Science in Management – Information Systems is conferred upon students who have successfully completed 33 credit hours of graduate coursework plus other course requirements as listed on the student's approved graduate program plan. Students without an adequate undergraduate background will be required to complete all or part of the program prerequisites. Students may choose elective courses with the approval of both the faculty advisor and the program head. Students with undergraduate credits for courses that they believe are equivalent to the program prerequisites should consult with their advisor concerning waiver of those prerequisites.

Curriculum

Candidates for the degree must successfully complete the following curriculum.

Program Prerequisite

Prerequisite is noncredit for this program.

MTH 1701 College Algebra

Note: Computer literacy is required as a prerequisite. It can be demonstrated by the applicant's undergraduate coursework, passing a proficiency examination offered by the extended studies department or by completing a suitable computer course.

Required Courses

MGT 5000 Financial Accounting

MGT 5002 Corporate Finance

MGT 5011 Management Theory and Thought

MGT 5013 Organizational Behavior

MGT 5020 Applied Management Project (*serves as the capstone course for the program*)

MGT 5033 Human Resources Management

MGT 5101 Leadership Theory and Effective Management

MGT 5106 Organizational Communication

Electives - Select three courses:

MGT 5070 Special Topics in Business
MGT 5150 Management of Software Systems
MGT 5151 Database Systems Management
MGT 5152 Computer Systems Administration
MGT 5153 Telecommunications Systems Management
MGT 5154 Advanced Management Information Systems

Note: Electives may be taken with approval from both the faculty advisor and the program head from other graduate-level offerings in other colleges or academic units.

Total Credits Required: 33

Required Courses and Course Descriptions

MGT 5000 Financial Accounting Credit Hours: 3 <i>Studies accounting concepts, the accounting model, measurement processes, financial statements, financial analysis, the accounting cycle, monetary and fixed assets, inventory, current and long-term liabilities, and equity structures of partnerships, proprietorships and corporations.</i>
MGT 5002 Corporate Finance Credit Hours: 3 <i>Covers concepts and tools of corporate financial management including corporate financial planning, forecasting, budgeting, quantitative techniques and practices. Considers the importance of ethics and the international aspects in financial decision-making. Recommended: Background knowledge equivalent to MGT 5000 Financial Accounting.</i>
MGT 5011 Management Theory and Thought Credit Hours: 3 <i>Overviews classical and contemporary management philosophies and theories. Focuses on managing enterprises in a rapidly changing global economy. Includes developing strategic vision, planning, organizing, directing and controlling, social responsibility and international management.</i>
MGT 5013 Organizational Behavior Credit Hours: 3 <i>Covers the contributions to management theory made by the behavioral sciences. Gives a better understanding of the human being and why he acts as he does. Studies individual and group behavior. Extensively uses current periodicals and case materials.</i>
MGT 5020 Applied Management Project Credit Hours: 3 <i>Covers concepts, tools and techniques for evaluation of research proposals and studies. Involves designing, conducting, evaluating and presenting oral and written forms of research. Assignments build on quantitative and qualitative research methods. Requirement(s): Recommended for the graduating semester. May serve as the capstone for certain majors. Must be taken during the last 12 credit hours of the program.</i>
MGT 5033 Human Resources Management Credit Hours: 3

Explores issues surrounding the employment of human resources in various organizational settings using lectures/guided discussions and case studies. May include recruitment/selection, job analyses/evaluation, equal employment opportunity, training/development, compensation/benefits, appraisal, labor relations, health and safety, and separation/retirement.

MGT 5101 Leadership Theory and Effective Management

Credit Hours: 3

Introduces and examines historical development of leadership theory and supporting research. Considers past and contemporary theory in self-analysis by students to define their own leadership styles. Recommended: Background knowledge equivalent to MGT 5013 Organizational Behavior.

MGT 5106 Organizational Communication

Credit Hours: 3

Includes basic communication theory and the effects of communication on human behavior and organizational effectiveness. Provides a basic understanding of organizational communication theory. Uses case studies and experiential exercises to improve communications skills.

Elective Courses and Course Descriptions

MGT 5070 Special Topics in Business

Credit Hours: 3

Independent study with a faculty member in some area of business in greater depth than is normally possible in a regular class. Requires a comprehensive term paper.

MGT 5150 Management of Software Systems

Credit Hours: 3

Explores management's consideration of functional requirement specifications, design, development, implementation and maintenance of computer-based software systems that provide information technology-related services to organizations. Recommended: Background knowledge equivalent to MGT 5014 Information Systems or MGT 5113 Project Management for Information Technology.

MGT 5151 Database Systems Management

Credit Hours: 3

Investigates how database management system techniques are used to design, develop, implement and maintain modern database applications in organizations. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5152 Computer Systems Administration

Credit Hours: 3

Covers a chief information officer's multiple role in management of computer-based resources, both centralized and networked data center operations with wide-area networks and local-area networks; computer-based systems development/maintenance/security. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5153 Telecommunications Systems Management

Credit Hours: 3

Explores the legal and technical operation environment of telecommunications in organizations. Assesses organizational ramifications of government telecommunications laws, policies and deregulatory activities. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5154 Advanced Management Information Systems

Credit Hours: 3

Covers the relationship between information technology and the strategic operational and functional areas of organizations in both global and domestic environments. Requirement(s): May serve as the capstone for certain majors. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

A-2: Educational Need

As mentioned in the background of A-1, all 13 programs have been approved by MHEC for 2015-2020 at the former Patuxent River location, and most for many years prior. The following table is a summary of enrollments and graduates from these programs over the most recent approved period of Academic Year (AY) 2016 through AY 2020 (Fall 2015-Summer 2020), and the total program graduates including the year of the first graduate.

Program Title	Degree/ Award	Total Enroll- ments AY16-AY20	Total Credits Taken AY16-AY20	Total Graduates AY16- AY20	Year First Graduate	Total Graduates Since Start
Acquisition & Contract Management	M.S.	22	66	3	1995	68
Acquisition & Contract Management	P.B.C.	7	21	1	2017	1
Aerospace Engineering	M.S.	103	309	11	1994	46
Business Administration	MBA	275	825	36	1982	*345
Computer Information Systems	M.S.	7	21	2	1995	41
Computer Science	M.S.	13	39	3	1984	85
Electrical Engineering	M.S.	28	84	6	1976	76
Engineering Management	M.S.	21	63	2	1985	95
Flight Test Engineering	M.S.	84	252	8	2019	8
Flight Test Engineering	P.B.C.	51	153	6	2019	6
Management	M.S.	36	108	7	1990	225
Management – AoC in Acquisition & Contract Mgt.	M.S.	22	66	5	1992	124
Management – AoC in	M.S.	16	48	2	1991	**68

Information Systems						
Total		685	2055	92		***1,188

*includes 78 PMBA graduates 1998-2011

**includes 5 MSM-Data Processing graduates 1991-1994

***1,188 graduates from these 13 programs represents more than 86% of 1,378 total Southern Maryland Graduates.

A-2: Educational Need

M.S. Acquisition & Contracts Management Post-Baccalaureate Certificate in Acquisition & Contracts Management

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

At the Navy's request, Florida Tech has been offering graduate programs in Acquisition & Contracts Management program at NAS Patuxent River since about 1990. The M.S. and Post-Baccalaureate Certificate (P.B.C.) in Acquisition & Contracts Management are two of three similar curricular programs included here, but essentially packaged differently to meet the unique needs of a diverse population of NAVAIR students. Presented later is the M.S. Management, AOC in Acquisition & Contracts Management. These 3 options are available to students depending on their individual interests.

NAVAIR is a major Acquisition Command that purchases about \$40 billion annually. These procurements cover a wide range of needs from major weapon system platforms such as the F-35 Joint Strike Fighter to local contracted services. Relative to Acquisition & Contracts Management, NAVAIR employs several hundreds of contracts specialists organized in a dedicated competency that is vital to their overall mission. The Navy in Southern Maryland continues to seek contracts specialists familiar with the full spectrum of contracting activities. These can include: planning, establishing, or reviewing contracts, programs, policies, or procedures; negotiations techniques to conduct contract negotiations and deal with high level business and industry in support of naval aviation.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more capabilities through advanced hardware and software, the contracting process becomes more complex and challenging. Additionally, as fleet readiness has moved to the forefront of the Navy's priorities, new and novel forms of contracting are being implemented to increase new capability speed to the fleet. The Navy's inventory of aircraft continues to grow, and with it, acquisition support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River.

NAWCAD attracts business, finance, and related majors from undergraduate schools from around the country. Many of these seek advanced degrees. Almost 70 students in Southern

Maryland have received M.S. in Acquisition and Contracts Management degrees from Florida Tech.

Florida Tech accepts for transfer credit, DAWIA certification courses taught by Defense Acquisition University (DAU). In Contracting, a student who achieves Level III Certification is eligible to receive up to 12 transfer credits toward this degree. Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Acquisition & Contracts Management, the increasing amount of specialized knowledge required for acquisition evaluation of complex weapons systems makes the contracts specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
Telecommunications	13,780	14,875	1,095	7.9%
Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

(1) Occupational Need

Contracts specialists are highly valued at any MRTFB. The desired learning outcomes for a contracts specialist supporting naval aviation programs are:

- Comprehend the contracting life cycle and the multitude of key stakeholders involved
- Understand major requirements of the acquisition process including compliance, timeliness, efficiency, quality, and customer satisfaction
- Understand what constitutes appropriate standards of conduct including the difference between unethical and illegal activities
- Understand the essentials of acquisition planning including analysis of contracting requirements and planning for competition and source selection
- Know the fundamentals of contract formation including the drafting of solicitations, evaluation of quotes and offers, and awarding of contracts

- Understand the fundamentals of contract administration including planning for successful contract administration, monitoring contract quality, administering payments, as well as modifications, terminations and closing out the contracts.
- Incorporate improvements in acquisition processes including focus on acquisition best practices, promotion of innovation and competition, and increased speed to capability

(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?

We could not identify a campus in Maryland that offered the M.S. in Acquisition & Contracts Management. The following Maryland institution offers a similar M.S. degree online:

- UMGC offers the M.S. in Management: Acquisition and Supply Chain Management (36 credits)

For the graduate certificate, Mount St. Mary's University offers a similar 15-credit graduate certificate in Government Contracting, but is located 130 miles north.

USMSM has approved two options for Southern Maryland students seeking traditional classroom delivery in this discipline. Webster University offers a 36-credit M.A. in Procurement and Acquisitions Management and a 18-credit Graduate Certificate in Government Contracting. The curriculum is similar to Florida Tech programs in Acquisition & Contracts Management, but courses are delivered in shorter, 9-week terms.

(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. Aerospace Engineering

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

At the Navy's request, Florida Tech has been offering the M.S. in Aerospace Engineering program at NAS Patuxent River since 1993.

The Navy in Southern Maryland seeks aerospace engineers familiar with the master's in aerospace engineering curriculum, particularly in the specializations of aerodynamics and fluid dynamics, aerospace structures and materials, combustion and propulsion, and flight mechanics and controls.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

Among the many thousands of technical and scientific personnel at NAWCAD, engineering is, by far, the largest field of employment. Aerospace Engineering leads all other engineering disciplines. NAWCAD attracts aerospace engineers from ABET-accredited undergraduate schools from around the country. Many of these seek advanced degrees. Almost 50 students in Southern Maryland have received M.S. in Aerospace Engineering degrees from Florida Tech. Presently, there are 7 active students persisting toward this degree.

Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River, see figures that follow.

Figure 3.6 – DON Aircraft Force Structure

Active Forces	FY 2019	FY 2020	FY 2021
Navy Carrier Air Wings	9	9	9
Marine Air Wings	3	3	3
Patrol Wings	2	2	2
Helicopter Maritime Strike Wings	2	2	2
Helicopter Combat Support Wings	2	2	2
Subtotal	18	18	18
Primary Authorized Aircraft (PAA) - Active			
Navy	2,314	2,376	2,426
Marine Corps	1,242	1,214	1,227
Subtotal	3,556	3,590	3,653

Figure 3.7 – DON Aircraft Inventory

Class Category	FY 2019	FY 2020	FY 2021
Attack	273	267	264
Fighter	58	57	79
In-Flight Refuel	78	83	81
Patrol	209	189	214
Rotary Wing	1,084	1,020	1,030
Strike Fighter	1,042	1,003	1,059
Tilt Rotor	311	311	320
Training Jet	277	277	276
Training Prop	311	310	310
Training Rotary	115	115	152
Transport	108	103	91
Unmanned	99	45	57
Utility	29	31	42
Warning	100	101	100
Total	4,094	3,912	4,075

Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in aviation-related industry through 2026 as shown in the table below. While most of these jobs may not require M.S. degrees in Aerospace Engineering, the increasing amount of specialized knowledge required for technical evaluation of complex engineering systems makes the aerospace engineer a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Air Transportation	5,292	5,449	157	3.0%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

(1) Occupational Need

Aerospace Engineers are highly valued at any MRTFB. The desired learning outcomes for an Aerospace Engineer supporting naval aviation programs are:

- Design, develop, and demonstrate mastery of fundamental aircraft performance, stability & control, and avionics theory.
- Ensure airworthiness and safety of naval aviation aircraft.
- Efficiently plan and conduct airborne flight test and evaluation.
- Critically analyze flight test data, draw logical conclusions, and form sensible recommendations.
- Cogently report research findings in written, oral, and graphical flight engineering formats.
- Work effectively within acquisition, research, development, and test and evaluation teams involved in naval aviation.

(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?

University of Maryland (UMD) College Park offers the M.S. in Aerospace Engineering on-campus. The College Park campus is 70 miles north of USMSM.

UMD College Park also offers a Professional Master of Engineering (M.Eng.) in Aerospace Engineering at USMSM. This program of study is also 30 credits. The differences are:

1. UMD M.Eng. programs are professional degrees offered through the Maryland Applied Graduate Engineering (MAGE). There is no thesis option. M.Eng. graduates typically do not seek a Ph.D. in Engineering.
2. UMD M.Eng. programs are delivered via compressed 2-way video broadcasted synchronously from College Park to several outlying sites and campuses in Maryland. Florida Tech M.S. Engineering programs are delivered in traditional face-to-face format taught by a qualified faculty member a classroom at USMSM.

Online Degree Options – There are numerous Graduate programs in Aerospace Engineering offered online in the United States.

- (c) 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?

At the Navy's request, Florida Tech has been offering MBA programs at NAS Patuxent River since about 1980.

NAVAIR is a major Acquisition Command that purchases about \$40 billion annually. These procurements cover a wide range of needs from major weapon system platforms such as the F-35 Joint Strike Fighter to local contracted services. Relative to Acquisition & Contracts Management, NAVAIR employs several hundreds of contracts specialists organized in a dedicated competency that is vital to their overall mission. The Navy in Southern Maryland continues to seek business and financial analysts familiar with the full spectrum of business support activities. These can include accounting, contracting, cost analysis, financial management, logistics, program management, and more.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more capabilities through advanced hardware and software, the contracting process becomes more complex and challenging. Additionally, as fleet readiness has moved to the forefront of the Navy's priorities, new and novel forms of contracting are being implemented to increase new capability speed to the fleet. The Navy's inventory of aircraft continues to grow, and with it, acquisition support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River.

NAWCAD attracts business, finance, and related majors from undergraduate schools from around the country. Many of these seek advanced degrees. Almost 350 students in Southern Maryland have received MBA or PMBA degrees from Florida Tech.

Florida Tech accepts for transfer credit, DAWIA certification courses taught by Defense Acquisition University (DAU). Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require MBA degrees, the increasing amount of specialized knowledge required for business analysis of complex weapons systems programs makes the business analyst a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
Telecommunications	13,780	14,875	1,095	7.9%
Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

Occupational Need

Business Analysts are highly valued at any MRTFB. The desired learning outcomes for a business analyst supporting naval aviation programs are the ability to:

- Review and understand how accounting, finance, economics, organizational behavior, and marketing principles, and strategy affect decisions in the firm that align with the organization's overall strategic and tactical goals.
- Analyze financial data, ratios, and reports for viability and stability compared against accepted industry standards.
- Identify macro and micro-economic trends and conditions that impact upon the viability of a governmental, other public, or private organization.
- Analyze effective organizational designs and behaviors – vision, mission, culture, and values – in governmental, other public, or private organizations.
- Identify and interpret industry-based quantitative data – production rates/quality, sales volume, customer satisfaction rates – that indicate viability and stability of a governmental, other public, or private organizations.
- Continuously refine and improve written and oral communications skills, especially in an increasingly virtual team environment.
- Adopt innovative and entrepreneurial business management practices in a rapidly changing environment, both nationally and globally
- Develop the capacity to think strategically about the organization's mission, its present business position, its long-term direction, its resources and competitive capabilities, the caliber of its strategy, and its opportunities for gaining sustainable competitive advantage.

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. 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, but none easily accessible for students seeking traditional classroom delivery.

USMSM has approved two options for Southern Maryland students seeking traditional classroom delivery in this discipline. Webster University offers a 36-credit MBA. The curriculum is similar to Florida Tech's program, but courses are delivered in shorter, 9-week terms.

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

A-1a: Program Description

The Master of Science in Information Technology degree program provides individuals the skills to manage and analyze the information technology (IT) needs for an organization or company, and determine how these assets are deployed and managed, logically, efficiently and securely. The objectives of the degree are to provide an enhanced focus on the strategic importance of the wide range of the IT spectrum including vital topics like database administration and cybersecurity in such critical demand by IT professionals. The M.S. in Information Technology program also has two optional 9-credit specializations in cybersecurity and database administration that allow students to more closely study these areas. The skills provided will prepare students in the areas of IT analysis, design and administration.

A-1b: Program Curricula
Master of Science in Information Technology
Cybersecurity Specialization
Database Administration Specialization

Taken from 2020-2021 University Catalog, see

https://catalog.fit.edu/preview_program.php?catoid=9&poid=3199&returnto=371

Information Technology, M.S.

Major Code: 8420

Degree Awarded: Master of Science

Age Restriction: No

Admission Status: Graduate

Delivery Mode(s): Classroom, Online, Blended Online, Off-site

Admission Materials: Résumé, transcripts

Location(s): Aberdeen, MD; Eglin Air Force Base, FL; Florida Tech Online; Hampton Roads, VA; Main Campus - Melbourne; National Capital Region, VA; Orlando, FL; Redstone/Huntsville, AL; Southern Maryland, MD; Spaceport, FL

Degree Requirements

The applicant to the Master of Science in Information Technology degree program must have a bachelor's degree from an accredited institution; however, the degree need not be in business administration. Students who are graduates from other fields, especially mathematics, science and engineering, are encouraged to apply. Students are not required to take the GRE to be accepted into the program.

Curriculum

Candidates for the degree must successfully complete the following curriculum. Not all courses are offered every term.

Core and Major Education (21 credit hours)

MGT 5013 Organizational Behavior

MGT 5014 Information Systems

MGT 5113 Project Management for Information Technology

MGT 5114 Introduction to Information Security Management

MGT 5115 Global Information Technology Management

MGT 5151 Database Systems Management

MGT 5154 Advanced Management Information Systems

Directed Electives (12 credit hours)

Select four courses from the following:

BUS 5618 Strategic Management of Technology and Innovation

BUS 5653 Information Management in Healthcare

BUS 5662 Project Tools and Techniques

MGT 5150 Management of Software Systems
MGT 5152 Computer Systems Administration
MGT 5155 Security in the Enterprise
MGT 5156 Host-Based Security
MGT 5157 Secure Networks and Communication
MGT 5158 Topics in Advanced Database Management
MGT 5159 Database Administration

Total Credits Required: 33

Information Technology, M.S. with Specializations

Core and Major Education (24 credit hours)

MGT 5013 Organizational Behavior
MGT 5014 Information Systems
MGT 5113 Project Management for Information Technology
MGT 5114 Introduction to Information Security Management
MGT 5115 Global Information Technology Management
MGT 5151 Database Systems Management
MGT 5152 Computer Systems Administration
MGT 5154 Advanced Management Information Systems

Cybersecurity Specialization Directed Electives (9 credit hours)

MGT 5155 Security in the Enterprise
MGT 5156 Host-Based Security
MGT 5157 Secure Networks and Communication

Database Administration Specialization Directed Electives (9 credit hours)

MGT 5151 Database Systems Management
MGT 5158 Topics in Advanced Database Management
MGT 5159 Database Administration

Total Credits Required: 33

Core Courses and Course Descriptions

MGT 5013 Organizational Behavior

Credit Hours: 3

Covers the contributions to management theory made by the behavioral sciences. Gives a better understanding of the human being and why he acts as he does. Studies individual and group behavior. Extensively uses current periodicals and case materials.

MGT 5014 Information Systems

Credit Hours: 3

Studies information systems design associated with business organizations. Includes development life cycles, requirements analysis, systems design and performance considerations. Views information systems as strategic tools to provide competitive advantage.

MGT 5113 Project Management for Information Technology

Credit Hours: 3

Examines the components and management process of complex projects from the information technology (IT) perspective. Introduces project management tools and techniques useful to the IT professional. Studies the formation and leadership requirements of project management.

MGT 5114 Introduction to Information Security Management

Credit Hours: 3

Examines the fundamental principles of computer security as applied to information technology (IT). Covers foundations, psychology, prevention, detection, human factors, technical considerations, management processes and future considerations for the security of information technology.

MGT 5115 Global Information Technology Management

Credit Hours: 3

Covers theory, development and impacts of national and international policy on information technology (IT). Explores how frequent shifts in public policy require IT businesses to adjust rapidly to adhere to regulations. Requires development of sophisticated strategies including new technologies, global transfer and analysis to be able to adapt to the changing environment.

MGT 5151 Database Systems Management

Credit Hours: 3

Investigates how database management system techniques are used to design, develop, implement and maintain modern database applications in organizations. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5152 Computer Systems Administration

Credit Hours: 3

Covers a chief information officer's multiple role in management of computer-based resources, both centralized and networked data center operations with wide-area networks and local-area networks; computer-based systems development/maintenance/security. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5154 Advanced Management Information Systems

Credit Hours: 3

Covers the relationship between information technology and the strategic operational and functional areas of organizations in both global and domestic environments. Requirement(s): May serve as the capstone for certain majors. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

Directed Electives

BUS 5618 Strategic Management of Technology and Innovation

Credit Hours: 3

Introduces the basic concepts of information technology and innovation from a strategic management perspective. Covers strategic management of high technology companies, emerging technologies in a global marketplace, and aligning product development and system design. Identifies the creation of new products and services, and how new ventures are exploited. Prerequisite: BUS 5460 and BUS 5610

BUS 5653 Information Management in Healthcare

Credit Hours: 3

Addresses issues related to the management of information for healthcare practitioners and consumers. Provides insight and experience, and applications of information technology that improve the quality of healthcare communication and delivery, and facilitates healthcare research.

BUS 5662 Project Tools and Techniques

Credit Hours: 3

Covers tools and techniques used to plan and control projects and accomplish business objectives. Emphasizes how to determine which tool or technique to use during different phases of the project life cycle. Uses project management software in exercises. Requirement(s): Must be enrolled in Florida Tech Online Prerequisite: BUS 5661 or MGT 5113

MGT 5150 Management of Software Systems

Credit Hours: 3

Explores management's consideration of functional requirement specifications, design, development, implementation and maintenance of computer-based software systems that provide information technology-related services to organizations. Recommended: Background knowledge equivalent to MGT 5014 Information systems or MGT 5113 Project Management for Information Technology.

MGT 5151 Database Systems Management

Credit Hours: 3

Investigates how database management system techniques are used to design, develop, implement and maintain modern database applications in organizations. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5152 Computer Systems Administration

Credit Hours: 3

Covers a chief information officer's multiple role in management of computer-based resources, both centralized and networked data center operations with wide-area networks and local-area networks; computer-based systems development/maintenance/security. Recommended: Background knowledge equivalent to MGT 5014 Information Systems.

MGT 5155 Security in the Enterprise

Credit Hours: 3

Examines topics relevant to managing security in an enterprise environment. Focuses on legal obligations and relevant legislation. Includes forensic investigation of security incidents, monitoring and surveillance, metrics and attack models. Recommended: Background knowledge equivalent to MGT 5114 Introduction to Information Security Management.

MGT 5156 Host-Based Security

Credit Hours: 3

Examines security from the system user's point of view. Provides an overview of computer application development (programming languages, compilers, development, distribution, software engineering). Also includes operating systems, databases, virtualization and Web applications. Requires no prior programming knowledge. Recommended: Background knowledge equivalent to MGT 5114 Introduction to Information Security Management.

MGT 5157 Secure Networks and Communication

Credit Hours: 3

Examines security in networked environments and digital communications. Includes the Open Systems Interconnection (OSI) model, communications protocols, wired and wireless communications, Internet security, addressing and routing, and digital certificates. Also presents best practices, methods and tools. Recommended: Background knowledge equivalent to MGT 5114 Introduction to Information Security Management.

MGT 5158 Topics in Advanced Database Management

Credit Hours: 3

Expands on basic knowledge of managing database systems to support today's complex systems. Includes query processing and optimization strategies, security and privacy issues, data analytics and decision support, and emerging technologies in a global environment. Prerequisite: MGT 5151

MGT 5159 Database Administration

Credit Hours: 3

Expands on basic knowledge of database administration in today's complex systems. Covers basic concepts, processes and procedures associated with administering a database system. Provides an overview of managing, configuring and maintaining such systems (assigning roles and responsibilities, backup and recover, security, performance). Prerequisite: MGT 5014

Educational Need

A-2: Educational Need

M.S. Computer Information Systems

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

At the Navy's request, Florida Tech has been offering the M.S. in Computer Information Systems program at NAS Patuxent River since 1993. This program is offered as an option for those seeking an advanced technical degree in the computer field, but hold an earned Bachelor's degree in other than Computer Science.

The Navy in Southern Maryland seeks computer information system specialists familiar with the master's in computer information system curriculum who can develop algorithmic thinking, and design, develop and test information systems in support of naval aviation.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more smart capabilities through advanced software, information systems is one of the leading technical disciplines on base. This is especially true in the growing field of autonomy and unmanned air systems. Additionally, the burgeoning field of Cybersecurity requires very specialized knowledge, skills and abilities in computer information systems. NAWCAD attracts computer information systems majors from undergraduate schools from around the country. Many of these seek advanced degrees. More than 40 students in Southern Maryland have received M.S. in Computer Information Systems degrees from Florida Tech, and an additional 75 students have earned the M.S. in Management, Systems Management, Project Management and PMBA degrees with Information Systems concentrations.

Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River, see figures that follow.

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Subtotal	18	18	18
Primary Authorized Aircraft (PAA) - Active			
Navy	2,314	2,376	2,426
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Figure 3.7 – DON Aircraft Inventory

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Rotary Wing	1,084	1,020	1,030
Strike Fighter	1,042	1,003	1,059
Tilt Rotor	311	311	320
Training Jet	277	277	276
Training Prop	311	310	310
Training Rotary	115	115	152
Transport	108	103	91
Unmanned	99	45	57
Utility	29	31	42
Warning	100	101	100
Total	4,094	3,912	4,075

Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Computer Information Systems, the increasing amount of specialized knowledge required for technical evaluation of complex software systems makes the information systems specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
Telecommunications	13,780	14,875	1,095	7.9%
Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

(1) Occupational Need

Computer Information Systems specialists are highly valued at any MRTFB. The desired learning outcomes for an information systems specialist supporting naval aviation programs are:

- Design, develop, test, and demonstrate mastery of fundamental principles of computer information systems.
- Ensure integrity and safety of naval aviation aircraft and avionics support systems.
- Efficiently plan and conduct airborne flight test and evaluation of information systems.
- Critically analyze computer systems test data, draw logical conclusions, and form sensible recommendations.
- Cogently report research findings in written, oral, and graphical computer information systems formats.
- Work effectively within acquisition, research, development, and test and evaluation teams involved in naval aviation.

(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?

The following Maryland institutions offer the M.S. in Computer Information Systems, Information Systems, Information Systems Management, or Management Information Systems at their campuses:

- Bowie State University (65 miles north)
- Capitol Technology University (70 miles north)
- University of Maryland (UMD) College Park (70 miles north)
- University of Maryland Baltimore County (85 miles north)
- Johns Hopkins University (90 miles north)

These programs are similar to the proposed Florida Tech program, but are not easily accessible to students in Southern Maryland, except online. There is presently no institution offering the M.S. in Computer Information Systems or similar program face-to-face at USMSM.

Online Degree Options – There are numerous Graduate programs in Computer Information Systems offered online in the United States.

- (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. Computer Science

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

At the Navy's request, Florida Tech has been offering the M.S. in Computer Science program at NAS Patuxent River since 1982.

The Navy in Southern Maryland seeks computer science specialists familiar with the master's in computer science curriculum who can develop algorithmic thinking, and design, develop and test software and information systems in support of naval aviation.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more smart capabilities through advanced software, Computer Science is one of the leading technical disciplines on base. This is especially true in the growing field of autonomy and unmanned air systems. Additionally, the burgeoning field of Cybersecurity requires very specialized Computer Science knowledge, skills and abilities. NAWCAD attracts computer science majors from ABET-accredited undergraduate schools from around the country. Many of these seek advanced degrees. 85 students in Southern Maryland have received M.S. in Computer Science degrees from Florida Tech.

Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River, see figures that follow.

Figure 3.6 – DON Aircraft Force Structure

Active Forces	FY 2019	FY 2020	FY 2021
Navy Carrier Air Wings	9	9	9
Marine Air Wings	3	3	3
Patrol Wings	2	2	2
Helicopter Maritime Strike Wings	2	2	2
Helicopter Combat Support Wings	2	2	2
Subtotal	18	18	18
Primary Authorized Aircraft (PAA) - Active			
Navy	2,314	2,376	2,426
Marine Corps	1,242	1,214	1,227
Subtotal	3,556	3,590	3,653

Figure 3.7 – DON Aircraft Inventory

Class Category	FY 2019	FY 2020	FY 2021
Attack	273	267	264
Fighter	58	57	79
In-Flight Refuel	78	83	81
Patrol	209	189	214
Rotary Wing	1,084	1,020	1,030
Strike Fighter	1,042	1,003	1,059
Tilt Rotor	311	311	320
Training Jet	277	277	276
Training Prop	311	310	310
Training Rotary	115	115	152
Transport	108	103	91
Unmanned	99	45	57
Utility	29	31	42
Warning	100	101	100
Total	4,094	3,912	4,075

Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Computer Science, the increasing amount of specialized knowledge required for technical evaluation of complex software systems makes the computer science specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
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Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

(1) Occupational Need

Computer Scientists are highly valued at any MRTFB. The desired learning outcomes for a computer science specialist supporting naval aviation programs are:

- Design, develop, test, and demonstrate mastery of fundamental principles of computer science and software engineering.
- Ensure integrity and safety of naval aviation aircraft and avionics support systems.
- Efficiently plan and conduct airborne flight test and evaluation of software systems.
- Critically analyze computer systems test data, draw logical conclusions, and form sensible recommendations.
- Cogently report research findings in written, oral, and graphical computer science and software engineering formats.
- Work effectively within acquisition, research, development, and test and evaluation teams involved in naval aviation.

(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?

The following Maryland institutions offer the M.S. in Computer Science at their campuses:

- Bowie State University (65 miles north)
- Capitol Technology University (70 miles north)

- University of Maryland (UMD) College Park (70 miles north)
- University of Maryland Baltimore County (85 miles north)
- Morgan State University (90 miles north)
- Towson University (90 miles north)
- Johns Hopkins University (90 miles north)
- Loyola University Maryland (90 miles north)
- Hood College (120 miles north)
- Other state institutions located farther away including Frostburg State and University of Maryland Eastern Shore

All these programs are similar to the proposed Florida Tech program, but are not easily accessible to students in Southern Maryland. There is presently no institution offering the M.S. in Computer Science or similar program face-to-face at USMSM.

Online Degree Options – There are numerous Graduate programs in Computer Science offered online in the United States.

- (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. Electrical Engineering

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

At the Navy's request, Florida Tech established operations at NAS Patuxent River in 1972 and began offering the M.S. in Electrical Engineering program.

The Navy in Southern Maryland seeks electrical engineers familiar with the master's in electrical engineering curriculum, particularly in the specializations of wireless communication, photonics, spacecraft systems, systems and information processing, and wireless systems and technology.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

Among the many thousands of technical and scientific personnel at NAWCAD, engineering is, by far, the largest field of employment. Electrical Engineering is one of the leading engineering disciplines on base. NAWCAD attracts electrical engineers from ABET-accredited undergraduate schools from around the country. Many of these seek advanced degrees. Almost 80 students in Southern Maryland have received M.S. in Electrical Engineering degrees from Florida Tech.

Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River, see figures that follow.

Figure 3.6 – DON Aircraft Force Structure

Active Forces	FY 2019	FY 2020	FY 2021
Navy Carrier Air Wings	9	9	9
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Patrol Wings	2	2	2
Helicopter Maritime Strike Wings	2	2	2
Helicopter Combat Support Wings	2	2	2
Subtotal	18	18	18
Primary Authorized Aircraft (PAA) - Active			
Navy	2,314	2,376	2,426
Marine Corps	1,242	1,214	1,227
Subtotal	3,556	3,590	3,653

Figure 3.7 – DON Aircraft Inventory

Class Category	FY 2019	FY 2020	FY 2021
Attack	273	267	264
Fighter	58	57	79
In-Flight Refuel	78	83	81
Patrol	209	189	214
Rotary Wing	1,084	1,020	1,030
Strike Fighter	1,042	1,003	1,059
Tilt Rotor	311	311	320
Training Jet	277	277	276
Training Prop	311	310	310
Training Rotary	115	115	152
Transport	108	103	91
Unmanned	99	45	57
Utility	29	31	42
Warning	100	101	100
Total	4,094	3,912	4,075

Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Electrical Engineering, the increasing amount of specialized knowledge required for technical evaluation of complex engineering systems makes the electrical engineer a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Computer and Electronic Product Manufacturing	17,573	18,970	1,397	7.9%
Electrical Equip., Appliance, and Component Mfg.	1,987	2,145	158	8.0%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections

<http://www.dlir.state.md.us/lmi/iandoproj/industry.shtml>

(1) Occupational Need

Electrical Engineers are highly valued at any MRTFB. The desired learning outcomes for an Electrical Engineer supporting naval aviation programs are:

- Design, develop, and demonstrate mastery of fundamental principles of systems mechanics, avionics performance, stability and control.
- Ensure airworthiness and safety of naval aviation aircraft and avionics support systems.
- Efficiently plan and conduct airborne flight test and evaluation of electrical systems.
- Critically analyze mechanical systems test data, draw logical conclusions, and form sensible recommendations.
- Cogently report research findings in written, oral, and graphical electrical and electrical engineering formats.
- Work effectively within acquisition, research, development, and test and evaluation teams involved in naval aviation.

(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?

The following Maryland institutions offer the M.S. in Electrical (EE) or Electrical and Computer Engineering (ECE) at their campuses:

- University of Maryland (UMD) College Park (70 miles north)
- University of Maryland Baltimore County (85 miles north)

- Morgan State University (90 miles north)
- Johns Hopkins University (90 miles north)

University of Maryland (UMD) College Park offers a Professional Master of Engineering (M.Eng.) in Electrical & Computer Engineering at USMSM. This program of study is also 30 credits. The differences are:

1. UMD M.Eng. programs are professional degrees offered through Maryland Applied Graduate Engineering (MAGE). There is no thesis option. M.Eng. graduates typically do not seek a Ph.D. in Engineering.
2. UMD M.Eng. programs are delivered via compressed 2-way video broadcasted synchronously from College Park to several outlying sites and campuses in Maryland. Florida Tech M.S. Engineering programs are delivered in traditional face-to-face format taught by a qualified faculty member a classroom at USMSM.

Online Degree Options – There are numerous Graduate programs in Electrical Engineering offered online in the United States.

- (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?

At the Navy's request, Florida Tech has been offering the M.S. in Engineering Management at NAS Patuxent River since about 1990. This program is offered as an option for engineers and other technical professionals seeking an advanced degree to help manage increasingly complex technical programs.

The Navy in Southern Maryland continues to seek engineers trained in aerospace, mechanical, civil, electrical, computer, flight test, and related disciplines. Engineering managers are required to optimize the engineering enterprise at NAVAIR.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

Among the many thousands of technical and scientific personnel at NAWCAD, engineering is, by far, the largest field of employment. Aerospace Engineering leads all other engineering disciplines. NAWCAD attracts engineers from ABET-accredited undergraduate schools from around the country. Many of these seek advanced degrees. Almost 100 students in Southern Maryland have received M.S. in Engineering Management degrees from Florida Tech.

Through a long-standing articulation agreement, U.S. Navy Test Pilot School (USNTPS) Graduates receive 9 transfer credits into the M.S. in Engineering Management degree. Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD reflecting the strong relationship held with NAS Patuxent River in support of naval aviation.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River, see figures that follow.

Figure 3.6 – DON Aircraft Force Structure

Active Forces	FY 2019	FY 2020	FY 2021
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Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in aviation-related industry through 2026 as shown in the table below. While most of these jobs may not require M.S. degrees in Engineering Management, the increasing amount of specialized knowledge required for full evaluation of complex engineering systems makes the engineering manager a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Air Transportation	5,292	5,449	157	3.0%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

Occupational Need

Engineering Managers are highly valued at any MRTFB. The desired learning outcomes for an engineering manager supporting naval aviation programs are:

- Oversee the design, development, and demonstration of systems engineering, performance, stability and control of aircraft systems.
- Ensure airworthiness and safety of naval aviation aircraft and avionics support systems.
- Efficiently plan and conduct airborne flight test and evaluation of aircraft systems.
- Review and advise on critical analysis of mechanical systems test data findings, conclusions, and recommendations.
- Inform leadership of technical program plans and progress.
- Work effectively across acquisition, research, development, and test and evaluation functions involved in naval aviation.

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 USMSM but converted these to online delivery.

There are similar programs in other parts of Maryland, including a 30-credit M.S. in Engineering Management at University of Maryland at Baltimore County (UMBC). The curriculum is very similar, but at 90 miles away, not easily accessible to Southern Maryland students.

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

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?

At the Navy's request, Florida Tech began offering the M.S. and Graduate Certificate in Flight Test Engineering programs at NAS Patuxent River in 2016.

The Navy in Southern Maryland seeks flight test engineers familiar with aircraft design, structures and materials, combustion and propulsion, flight mechanics and controls, avionics, and weapons systems. Flight test is the largest engineering practice at the NAVAIR warfare center divisions.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

Among the many thousands of technical and scientific personnel at NAWCAD, engineering is, by far, the largest field of employment. Disciplines include aerospace, mechanical, civil, electrical, computer, flight test, and related disciplines. NAWCAD attracts engineers from ABET-accredited undergraduate schools from around the country. Many of these seek advanced degrees. To date, 8 students in Southern Maryland have received M.S. in Flight Test Engineering degrees and 6 students have earned Flight Test Engineering Graduate Certificates from Florida Tech. Flight Test Engineering is now the most popular academic program at Southern Maryland

The Flight Test Engineering program was made possible through the Education Partnership Agreement (EPA) with NAWCAD and the articulation agreement with the U.S. Navy Test Pilot School (USNTPS). USNTPS Graduates receive 12 transfer credits into the M.S. in Flight Test Engineering degree.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River, see figures that follow.

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Active Forces	FY 2019	FY 2020	FY 2021
Navy Carrier Air Wings	9	9	9
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Patrol	209	189	214
Rotary Wing	1,084	1,020	1,030
Strike Fighter	1,042	1,003	1,059
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Training Jet	277	277	276
Training Prop	311	310	310
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Transport	108	103	91
Unmanned	99	45	57
Utility	29	31	42
Warning	100	101	100
Total	4,094	3,912	4,075

Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in aviation-related industry through 2026 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	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Air Transportation	5,292	5,449	157	3.0%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

Occupational Need

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. The Florida Tech 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.

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.

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?

Societal Need – N/A

- (e) 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 program available in Southern Maryland or throughout the state of Maryland.

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

A-2: Educational Need

M.S. Management

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

At the Navy's request, Florida Tech has been offering the M.S. in Management program at NAS Patuxent River since about 1985.

NAVAIR is a major Acquisition Command with an annual budget of about \$40 billion. NAVAIR manages programs that cover a wide range of needs from major weapon system platforms such as the F-35 Joint Strike Fighter to local contracted services. As such, the Navy in Southern Maryland seeks specialists in engineering, contracts, logistics, business and finance, and other fields who can advance in their organizations into management and leadership positions.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more capabilities through advanced hardware and software, the business support processes become more complex and challenging. Additionally, as fleet readiness has moved to the forefront of the Navy's priorities, capability speed to the fleet has moved up as a strategic priority throughout the DoN, and especially at NAVAIR. The inventory of the Navy's aircraft continues to grow, and with it, acquisition support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River.

NAWCAD attracts business, finance, and related majors from undergraduate schools from around the country. Many of these seek advanced degrees such as the M.S. in Management. Since 1985, 225 students in Southern Maryland have received M.S. in Management degrees from Florida Tech.

Florida Tech accepts for transfer credit, DAWIA certification courses taught by Defense Acquisition University (DAU). Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Management, the increasing amount of specialized knowledge required for management of complex weapons systems makes the management specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
Telecommunications	13,780	14,875	1,095	7.9%
Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

▪ Occupational Need

Management specialists are highly valued at any MRTFB. The desired learning outcomes for a manager supporting naval aviation programs are the ability to:

- Analyze financial data, ratios, and reports for viability and stability compared against accepted industry standards
- Identify macro and micro-economic trends and conditions that impact upon the viability of a governmental, other public, or private organization
- Analyze effective organizational designs and behaviors – vision, mission, culture, and values – in governmental, other public, or private organizations
- Identify and interpret industry-based quantitative data – production rates/quality, sales volume, customer satisfaction rates – that indicate viability and stability of a governmental, other public, or private organizations
- Continuously refine and improve written and oral communications skills, especially in an increasingly virtual team environment
- Develop leadership skills that can bring synergy among human resources, technology, and business strategy
- Adopt innovative and entrepreneurial management practices in a rapidly changing environment, both nationally and globally

▪ 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?

We could not identify a campus in Maryland that offered the M.S. in Management without a specialization, e.g., project management, supply chain management, and information management. The following Maryland institutions offer similar M.S. degree programs:

- UMD College Park offers a 30-credit M.S. in Business and Management that may be completed in 2 semesters. This appears to be a full-time program for students who hold non-business bachelor's degrees
- UMGC offers online a 36-credit M.S. in Management with several specializations including Acquisition and Supply Chain Management and Information Systems and Services as mentioned elsewhere

These programs share similarities in curriculum with the Florida Tech program, but the delivery methods and student types are different. The UMD program appears to be for the full-time student, and the campus is 70 miles north, not easily accessible from Southern Maryland. The UMGC program is available online. The Florida Tech M.S. in Management can be delivered in traditional face-to-face format taught by a qualified faculty member in a classroom at USMSM.

- (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. Management, AOC in Acquisition & Contracts Management

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

At the Navy's request, Florida Tech has been offering the M.S. in Management, AOC in Acquisition & Contracts Management program at NAS Patuxent River since about 1995. The concentration was added to the M.S. in Management degree for senior specialists and managers in the contracting field.

NAVAIR is a major Acquisition Command that purchases about \$40 billion annually. These procurements cover a wide range of needs from major weapon system platforms such as the F-35 Joint Strike Fighter to local contracted services. Relative to Acquisition & Contracts Management, NAVAIR employs several hundreds of contracts specialists organized in a dedicated competency that is vital to their overall mission. The Navy in Southern Maryland continues to seek contracts specialists familiar with the full spectrum of contracting activities. These can include: planning, establishing, or reviewing contracts, programs, policies, or procedures; negotiations techniques to conduct contract negotiations and deal with high level business and industry in support of naval aviation.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more capabilities through advanced hardware and software, the business support processes become more complex and challenging. Additionally, as fleet readiness has moved to the forefront of the Navy's priorities, capability speed to the fleet has moved up as a strategic priority throughout the DoN, and especially at NAVAIR. The inventory of the Navy's aircraft continues to grow, and with it, acquisition support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River.

NAWCAD attracts business, finance, and related majors from undergraduate schools from around the country. Many of these seek advanced degrees such as the M.S. Management, AOC in Acquisition & Contracts Management. Since 1995, almost 50 students in Southern Maryland have received M.S. in Management, AOC in Acquisition & Contracts Management degrees from Florida Tech.

Florida Tech accepts for transfer credit, DAWIA certification courses taught by Defense Acquisition University (DAU). Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Management, AOC in Acquisition & Contracts Management, the increasing amount of specialized knowledge required for management of complex weapons systems makes the management specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
Telecommunications	13,780	14,875	1,095	7.9%
Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/Imi/iandoproj/industry.shtml>

Occupational Need

Management specialists are highly valued at any MRTFB. The desired learning outcomes for a manager supporting naval aviation programs are the ability to:

- With particular emphasis in contracts management, analyze financial data, ratios, and reports for viability and stability compared against accepted industry standards
- Identify macro and micro-economic trends and conditions that impact upon the viability of a governmental, other public, or private organization
- Analyze effective organizational designs and behaviors – vision, mission, culture, and values – in governmental, other public, or private organizations
- Identify and interpret industry-based quantitative data – production rates/quality, sales volume, customer satisfaction rates – that indicate viability and stability of a governmental, other public, or private organizations
- Continuously refine and improve written and oral communications skills, especially in an increasingly virtual team environment
- Develop leadership skills that can bring synergy among human resources, technology, and business strategy

- Adopt innovative and entrepreneurial management practices in a rapidly changing environment, both nationally and globally

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?

We could not identify a campus in Maryland that offered the M.S. in Management, AOC in Acquisition & Contracts Management. The following Maryland institution offers a similar M.S. Management concentration degree:

- UMGC offers online, the M.S. in Management: Acquisition and Supply Chain Management Specialization (36 credits)

This program does have similarities with the Florida Tech program, but is only offered online. The Florida Tech M.S. in Management, AOC in Acquisition & Contracts Management can be delivered in traditional face-to-face format taught by a qualified faculty member a classroom at USMSM.

- (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. Management, AOC in Information Systems

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

At the Navy's request, Florida Tech has been offering the M.S. in Management, AOC in Information Systems program at NAS Patuxent River since about 2000. As mentioned previously, the M.S. in Computer Information Systems was introduced in 1993. This Management specialty program was a logical extension as knowledge in information technology and systems increased. This need has continued to increase, at an even greater rate with major interest and investment in cloud computing, cybersecurity, advanced web development, and related efforts.

NAVAIR is a major Acquisition Command with an annual budget of about \$40 billion. NAVAIR manages programs that cover a wide range of needs from major weapon system platforms such as the F-35 Joint Strike Fighter to local contracted services. As such, the Navy in Southern Maryland seeks specialists in engineering, contracts, logistics, business and finance, and other fields who can advance in their organizations into management and leadership positions.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more capabilities through advanced hardware and software, the business support processes become more complex and challenging. Additionally, as fleet readiness has moved to the forefront of the Navy's priorities, capability speed to the fleet has moved up as a strategic priority throughout the DoN, and especially at NAVAIR. The inventory of the Navy's aircraft continues to grow, and with it, acquisition support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at NAS Patuxent River.

NAWCAD attracts business, finance, and related majors from undergraduate schools from around the country. Many of these seek advanced degrees such as the M.S. in Management, AOC in Information Systems. Since 2000, 13 students in Southern Maryland have received M.S. in Management, AOC in Information Systems degrees from Florida Tech.

Florida Tech accepts for transfer credit, DAWIA certification courses taught by Defense Acquisition University (DAU). Florida Tech also holds an Education Partnership Agreement (EPA)

with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Management, AOC in Information Systems, the increasing amount of specialized knowledge required for management of complex weapons systems makes the management specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
Telecommunications	13,780	14,875	1,095	7.9%
Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections

<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

Occupational Need

Management specialists are highly valued at any MRTFB. The desired learning outcomes for a manager supporting naval aviation programs are the ability to:

- With particular emphasis in information systems, analyze financial data, ratios, and reports for viability and stability compared against accepted industry standards
- Identify macro and micro-economic trends and conditions that impact upon the viability of a governmental, other public, or private organization
- Analyze effective organizational designs and behaviors – vision, mission, culture, and values – in governmental, other public, or private organizations
- Identify and interpret industry-based quantitative data – production rates/quality, sales volume, customer satisfaction rates – that indicate viability and stability of a governmental, other public, or private organizations
- Continuously refine and improve written and oral communications skills, especially in an increasingly virtual team environment
- Develop leadership skills that can bring synergy among human resources, technology, and business strategy
- Adopt innovative and entrepreneurial management practices in a rapidly changing environment, both nationally and globally

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?

We could not identify a campus in Maryland that offered the M.S. in Management, AOC in Information Systems. The following Maryland institution offers a similar M.S. Management concentration degree:

- UMGC offers online, the M.S. in Management: Information Systems and Services Specialization (36 credits)

This program does have similarities with the Florida Tech program, but is only offered online. The Florida Tech M.S. in Management, AOC in Information Systems can be delivered in traditional face-to-face format taught by a qualified faculty member a classroom at USMSM.

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

A-2: Educational Need
Master of Science in Information Technology
Cybersecurity Specialization
Database Administration Specialization

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

At the Navy's request, Florida Tech has been offering graduate programs in information systems at NAS Patuxent River since about 1980. The Master of Science in Information Technology program is offered as an option for those seeking an advanced technical management degree in the IT field.

The Navy in Southern Maryland seeks information technology specialists familiar with the master's in information technology curriculum who can develop algorithmic thinking, and design, develop and test information technology systems and platforms in support of naval aviation.

NAS Patuxent River is the premier flight test and evaluation facility in the U.S. armed forces, and the research and development center for Naval Aviation in the U.S. Navy. It is one of four Major Range and Test Facilities Bases (MRTFB) dedicated to flight test and evaluation in the United States and employs more than 20,000 military, civilian, and contractor personnel. The Naval Air Warfare Center, Aircraft Division (NAWCAD) is the largest tenant at NAS Patuxent River, and carries out the major mission of flight test engineering. This involves the full systems development life cycle and continues through operational use and retirement of the platform, whether an entire aircraft or system component.

As weapons systems integrate more and more smart capabilities through advanced software, information technology is one of the leading technical disciplines on base. This is especially true in the growing field of autonomy and unmanned air systems. Additionally, the burgeoning field of Cybersecurity requires very specialized knowledge, skills and abilities in computer information systems. NAWCAD attracts computer information systems majors from undergraduate schools from around the country. Many of these seek advanced degrees. More than 40 students in Southern Maryland have received M.S. in Computer Information Systems degrees from Florida Tech, and an additional 75 students have earned the M.S. in Management, Systems Management, Project Management and PMBA degrees with Information Systems concentrations.

Florida Tech also holds an Education Partnership Agreement (EPA) with NAWCAD and an articulation agreement with the U.S. Navy Test Pilot School (TPS). These agreements reflect the long-standing relationship held with NAS Patuxent River in support of naval aviation.

The Navy's inventory of aircraft continues to grow, and with it, acquisition and technical support from the Naval Air Systems Command (NAVAIR), NAWCAD, and other commands at

NAS Patuxent River, see figures that follow.

Figure 3.6 – DON Aircraft Force Structure

Active Forces	FY 2019	FY 2020	FY 2021
Navy Carrier Air Wings	9	9	9
Marine Air Wings	3	3	3
Patrol Wings	2	2	2
Helicopter Maritime Strike Wings	2	2	2
Helicopter Combat Support Wings	2	2	2
Subtotal	18	18	18

Primary Authorized Aircraft (PAA) - Active			
Navy	2,314	2,376	2,426
Marine Corps	1,242	1,214	1,227
Subtotal	3,556	3,590	3,653

Figure 3.7 – DON Aircraft Inventory

Class Category	FY 2019	FY 2020	FY 2021
Attack	273	267	264
Fighter	58	57	79
In-Flight Refuel	78	83	81
Patrol	209	189	214
Rotary Wing	1,084	1,020	1,030
Strike Fighter	1,042	1,003	1,059
Tilt Rotor	311	311	320
Training Jet	277	277	276
Training Prop	311	310	310
Training Rotary	115	115	152
Transport	108	103	91
Unmanned	99	45	57
Utility	29	31	42
Warning	100	101	100
Total	4,094	3,912	4,075

Source: Highlights of the Department of the Navy FY 2020 Budget

http://www.secnav.navy.mil/fmc/fmb/Documents/20pres/Highlights_book.pdf pages 3-6, 3-7

Maryland is expecting strong employment in defense and industrial sectors including technical services, telecommunications, and related occupations through 2026 as shown in the table below. While most of these jobs will not require M.S. degrees in Information Technology, the increasing amount of specialized knowledge required for technical evaluation of complex software systems makes the information systems specialist a valuable asset.

Industry Sector	2016	2026	Change	% Chg
Federal Government, Excluding Post Office	133,138	134,655	1,517	1.1%
Professional, Scientific, and Technical Services	252,955	273,060	20,105	7.9%
Information	41,434	43,857	2,423	5.8%
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Other Information Services	9,656	10,423	767	7.9%

Source: Maryland Department of Labor, Licensing and Regulation, Maryland Occupational Projections 2016 – 2026, Maryland Industry Projections
<http://www.dllr.state.md.us/lmi/iandoproj/industry.shtml>

(1) Occupational Need

Information Technology specialists are highly valued at any MRTFB. The desired learning outcomes for an information systems specialist supporting naval aviation programs are:

- Design, develop, test, and demonstrate mastery of fundamental principles of information technology systems.
- Ensure integrity and safety of naval aviation aircraft and avionics support systems with emphasis on cybersecurity and platform database administration.
- Efficiently plan and conduct test and evaluation of information technology systems.
- Critically analyze information technology test data, draw logical conclusions, and form sensible recommendations.
- Cogently report research test and evaluation findings in written, oral, and graphical information systems formats.
- Work effectively within acquisition, research, development, and test and evaluation teams involved in information technology systems and platforms.

(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?

The following Maryland institutions offer the M.S. in Information Technology:

- UMGC online M.S. Information Technology (36 credits)

- Hood College, M.S. Information Technology (30 credits), 120 miles north

These programs are similar to the proposed Florida Tech program, but are not easily accessible to students in Southern Maryland, except online. There is presently no institution offering the M.S. in Information Technology or similar program face-to-face at USMSM.

Online Degree Options – In addition to UMGC, there are numerous Graduate programs in Information Technology offered online in the United States.

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

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. 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,

A handwritten signature in black ink, reading "Jennie C. Hunter-Cevera". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

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

JCHC:JVF:mrw

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